Energy Insights

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Impact of low crude prices on refining

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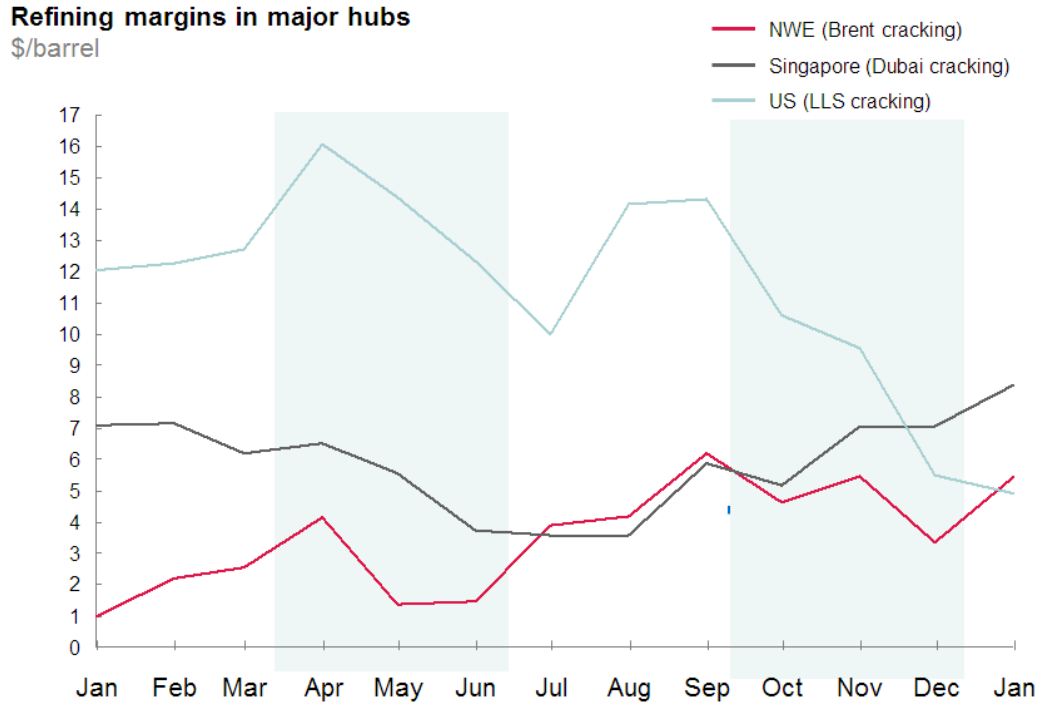
The recent fall in crude oil prices has coincided with both higher and lower profitability in the downstream sector, depending upon which region one considers. Asia and Europe have seen clearly higher margins buoyed by higher apparent demand for product to build inventories. North American margins have fallen sharply due to loss of some of the region's recent structural advantages versus the rest of the world. Moving forward, we expect sustained lower crude prices to have a (moderately) negative effect on refining margins. The only sustained positive effect would have to come from stimulation of higher demand, which would largely occur in the longer term.

Refiner performance at lower prices has varied regionally

Since mid-2014, we have seen a dramatic fall in crude oil prices as the average Brent price went down from USD 112/bbl in June 2014 to USD 48/bbl in January 2015 (a more than 50% decline). However, refiners have generally not been reporting a sharp decrease in earnings and in some regions margins have clearly improved (Exhibit 1). Specifically, European and Asian refiners have enjoyed higher refining margins over the last two quarters of 2014, compared to both the first half of 2014 and to the same period for 2013. However, their US peers have clearly experienced a deteriorating margin environment, going from cracking margins several times higher than in other markets to levels at or below Europe and Asia.

EXHIBIT 1

Refining margins have behaved differently across major hubs



Source: Energy Insights – OilDesk, Platts

Europe

In Europe, light product prices – diesel in particular – declined at a slower pace than those for crude. We believe this was driven largely by storage capacity dynamics. Crude storage, which initially started filling in response to falling crude prices and the market moving into contango, soon ran out of spare capacity. As a result, crude started pushing into the refining system to be converted to finished products that still had capacity to increase storage. European refinery run rates increased by nearly 1mn bbl/day and capacity utilization jumped from mid-70% to ~85% in the final months of 2014. At the same time, commercial products inventories – especially in Northwest Europe – increased; light products stocks reached 145.6 mn bbl in November 2014, up since mid-year, and almost 7% above their 5-year monthly average. This stock-building dynamic helped support European products prices and margins for refiners, with Brent cracking margins over $2/bbl higher in both the 3rd and 4th quarters of 2014 compared with the second quarter.

Asia

Refining margins in Asia showed an even stronger upward trend at the end of the year than those in Europe. One of the underlying drivers, similarly to Europe, was an increase in products storage, which included delaying cargo deliveries to final markets by slowing tanker sailing speeds or choosing longer routes (e.g., Europe to Asia around Cape Horn rather than through the Suez Canal). As a result, in the fourth quarter of 2014, Dubai cracking margins in Singapore at $6.4/bbl were over $2/bbl up compared with the third quarter of the same year and have continued to increase, reaching $8.4/bbl in January 2015.

United States

In the US market, the story was quite different. Margins in the fourth quarter compressed dramatically as local crude prices rose and light product prices fell relative to international benchmarks. The prices of US domestic and West Canadian crudes, which together make up more than 60% of all crude processed in the US, saw a significant part of their discount to Brent and other international crudes erode. There appear to be three factors at work here. Firstly, crude inventories rose as prices fell helping to soak up some of the local oversupply of crude. Crude exports also rose as more Canadian production made it to the Gulf Coast where it could be exported; additionally, more US crude was exported to Eastern Canada. Finally, US refiners processed record amounts of crude (US refinery input of 16.5 mb/d in July was the highest since at least 2005, while the subsequent months continued to be among the strongest on record). As a result, the overall differential of US domestic crude to Brent narrowed: spreads between main US crudes (LLS, Mars, and WTI) and Brent compressed by $4-6/bbl between June 2014 and January 2015.

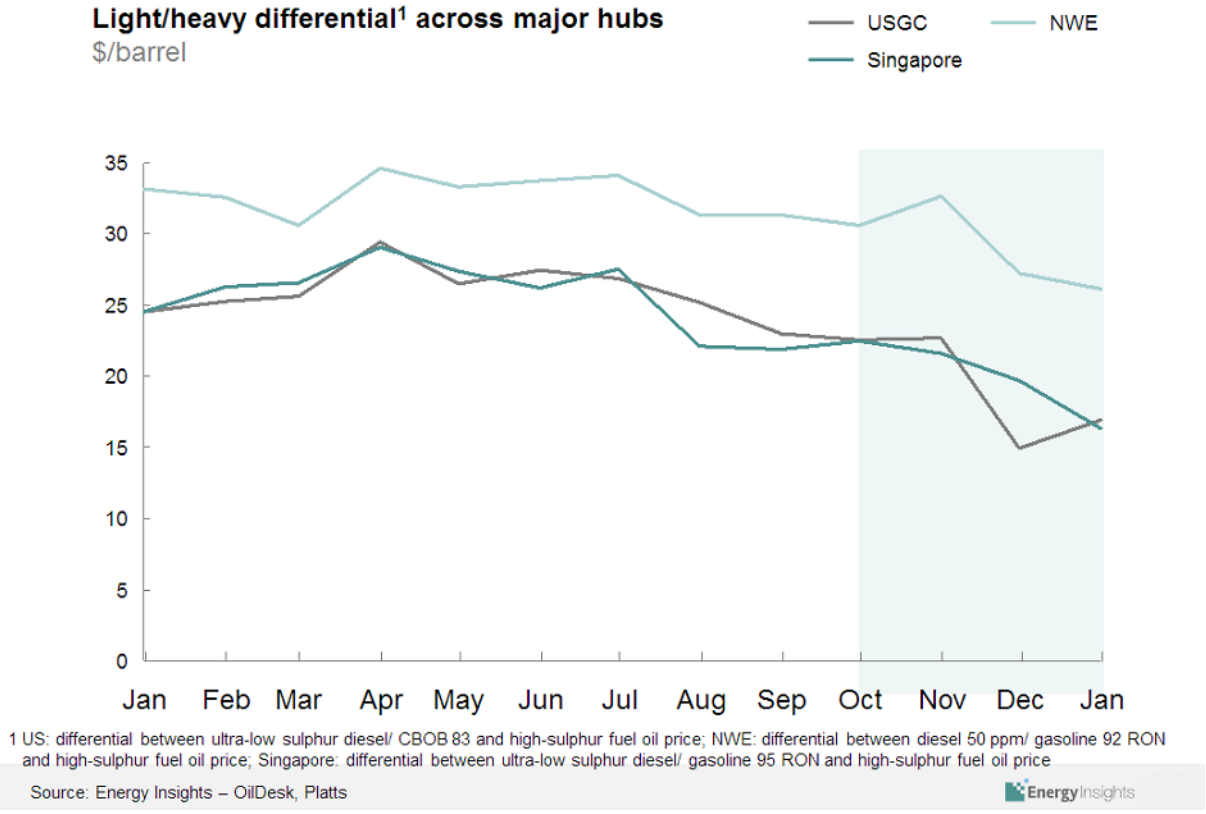
At the same time, there was a sharp decline in the gasoline premium to crude oil. This is common at this time of year as gasoline demand goes through a seasonal decline and changes in quality specifications make it easier to produce. However, the effect in the past few months was made more dramatic by the unusually high rates of refinery utilization.

One common pattern across all three regions has been the compression of the light/heavy differential, which declined by between $8 and $11/bbl between June 2014 and January 2015 across the three hubs (Exhibit 2). While lower light/heavy differentials do not usually have a massive effect

on the profitability of an average-complexity refiner, they do mean margin deterioration for complex refiners, reducing the value of processing heavier crudes into lighter products. Comments from some majors on their downstream results confirm that this factor has negatively affected their performance.

EXHIBIT 2

Light/heavy differentials have narrowed visibly in the second half of 2014



1 US: differential between ultra-low sulphur diesel/ CBOB 83 and high-sulphur fuel oil price; NWE: differential between diesel 50 ppm/ gasoline 92 RON and high-sulphur fuel oil price; Singapore: differential between ultra-low sulphur diesel/ gasoline 95 RON and high-sulphur fuel oil price

Source: Energy Insights – OilDesk, Platts

Effect on refining margins is consistent with historical observations

Developments in the downstream market in response to lower crude prices are generally following historical patterns of behavior. This typically progresses through three stages.

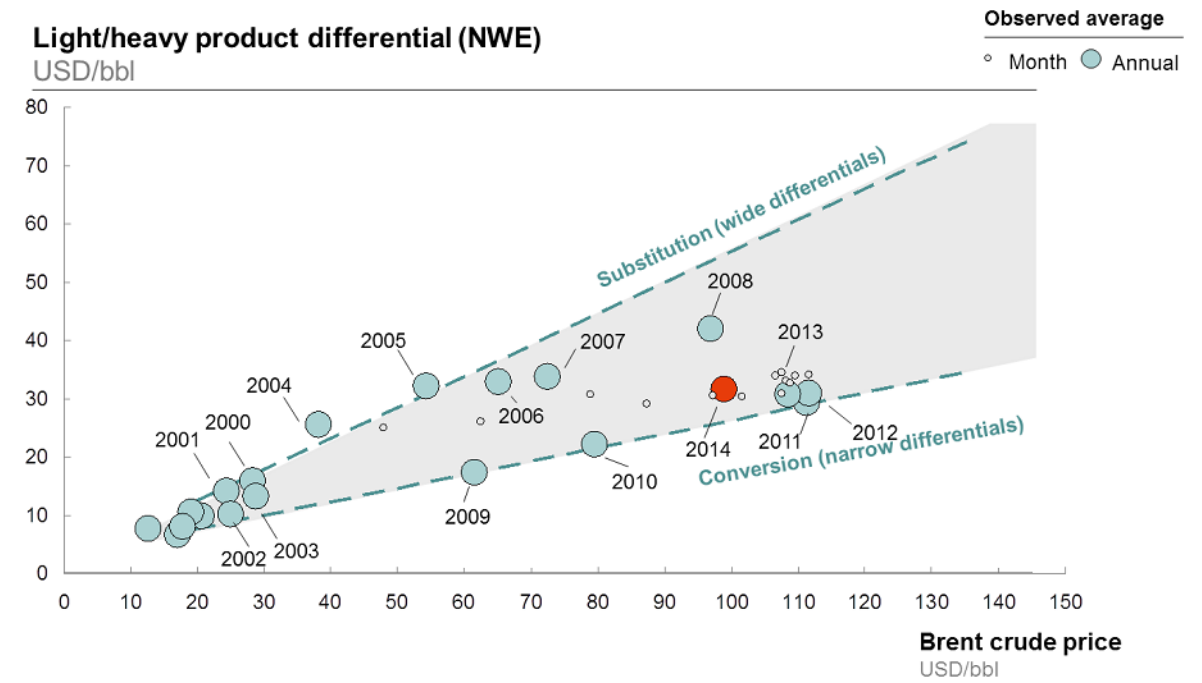
In the first stage, market volatility is the dominant force. Product prices often fall less quickly than crude as demand for products to build storage grows. This first phase normally comes to an end after a few months as soon as product price declines catch up with crude price declines.

In the second stage, supply and demand fundamentals stabilize resulting in a compression of refining margins. With lower crude prices, there is a general compression of most refining products spreads and differentials. Most spreads reflect the "cost" of transforming one crude or product into another, with most of the cost theoretically being equivalent to a loss of volume. At lower absolute prices, the cost of this volume loss declines, narrowing the spread. A good example is the narrowing of the light/heavy differential, evidenced by historical relationships between crude price and the

light/heavy spread. Based on the light/heavy differential developments in the main hubs, the differential compression also seems to hold true in the case of the most recent crude price decline.

EXHIBIT 3

Light/heavy product differential typically narrows with lower crude prices



SOURCE: Platts; Team analysis

The third stage effect depends on how sustainable the new crude prices environment becomes. With sustained low prices, there will typically be a rise in demand for light products. This comes both directly from the reduced incentives to improve efficiency or boost non-oil based substitutes and from the indirect effect of lower prices on economic growth. However, this usually takes place only in the longer term, as both supply and demand typically need more time to react to changed crude prices.

Volatility period is likely to end within a few months

Markets are likely to move from the first phase of market volatility to the second phase governed by market fundamentals within a few months. The exact timing is subject to the uncertainty of how much product storage capacity is available, given this can extend even into the secondary distribution system or customer products storage facilities. There have been reports of recent enquiries regarding the use of floating storage for products in Singapore as its tank capacity is filling up. Once the capacity is full, products supply into the market should increase and may drive prices down, therefore compressing regional margins again. This suggests lower margins for Europe and Asia in the coming months.

In the US market, margins have recently improved as the glut of product developed in the fourth quarter has eased and local crude prices have re-equilibrated at a (small) discount to the international market. This should net out to a refining environment with lower margins than 2014 overall, but not as bad as the fourth quarter. The major wildcard will be how much US crude production volumes are affected by lower crude prices and the impact that this has on the local crude balance.

For refiners, the key implication is that the effect of lower crude prices as a driver of future profitability will be small relative to the global supply/demand balance for refining and the longer term mandated drive for efficiency gains in the automotive fleets. And this, unfortunately, is quite clearly negative. While some increase in light product demand is possible in the longer term (potentially delayed in some countries due to the effect of subsidy removal as governments take this opportunity to relax refined products price controls), most likely it will not be enough to outweigh the impact of the expected global refining capacity overhang and the resulting poor refinery utilization in some key regions.

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