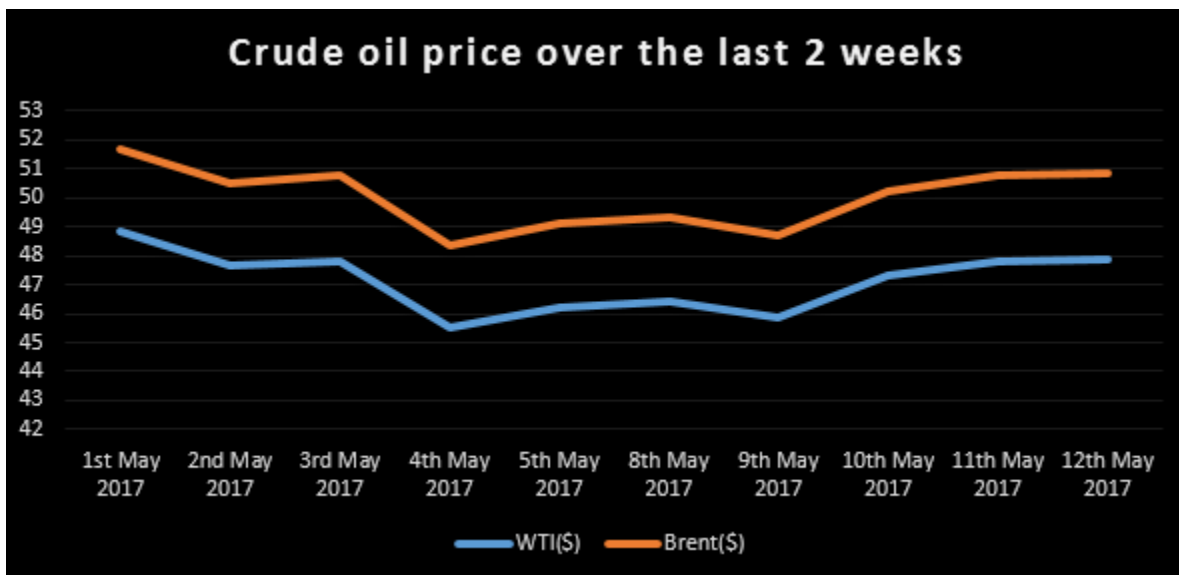
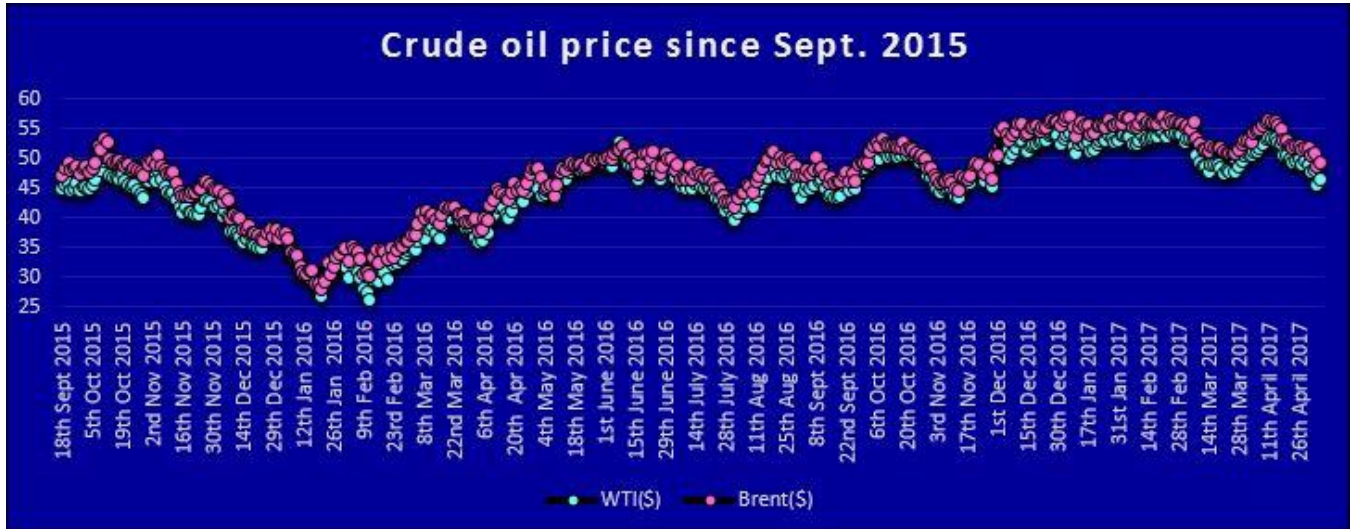


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The price of oil has shown the following variation over the last week:



- After last week's route, the price of oil gained some ground this week after receiving an indications that OPEC members have a consensus in extending output cuts and also because US stockpiles fell last week by 5.25 mb. However, the gasoline demand in the US continues to lag behind the previous years.
- OPEC members and Russia are gearing up for their forthcoming meeting on May 25 and decide on extending their production cuts for another six months. Their implemented production cuts for the first six months in 2017 have not delivered the expected results, thanks to the rising US

shale oil production during the last five months. Since the beginning of the year, as the price of crude oil touched \$50 and above, the US shale oil production has risen by 600,000 barrels per day, which is half of the production cuts of 1.2 mb/d suggested by OPEC and Russia. Having said that, the OPEC decision has had some positive impact in that the US stockpiles have dropped somewhat, the floating storage has shrunk, and the IEA and banks have predicted their contraction in the second half of 2017. The fall in prices in the service sector and more efficiency gains have led to a strong production growth for the shale producers, but the downside of all these cutting measures is the expectation that the resilient US shale producers may flood the market in 2018, as happened in 2014. The US EIA has revised its projections for domestic output to 9.96 mb/d in 2018, up from 9.9 mb/d last month, and the US crude production may cross the 10 mb/d mark, a record that was set in 1970. In 2017, the production will average 9.31 mb/d, which is up from 9.22 mb/d in April. This does not sound good for next year, even though some analysts think that the extension of OPEC cuts in the second half of 2017 will rebalance the market by the end of the year assuming China's oil demand will stay course and match last year's numbers, and India's growth of over 7 % will drive demand. Others suggest that the OPEC/non-OPEC deal should be extended to 2018, or else the crude price will fall back to \$40.

- As reported in my last blog post, the big oil companies including Exxon Mobil, Royal Dutch Shell, Total, BP and Chevron reported Q1 profits and paid dividends recently. This has put them in a situation similar to when oil was \$100 a barrel and above 3 years ago, and suggests that companies can impose austerity measures comprising layoffs and slashing project spending to become profitable faster. Despite the profits that they have shown, these companies have accumulated huge debts over the last two years, and would need cautious spending and investing to ensure secure future supply. Resilience in a low-price environment seems to be the new mantra for them for profit survival.
- According to Baker Hughes data for the week ending May 5th, 2017, the US offshore rig count is up by two to 19, and the total US rig count is 877 (703 oil, 173 gas and 1 miscellaneous).
- According to some analysts, production from the Gulf of Mexico will start declining from next year as operators have been cutting investment and new projects have been pushed off their schedule. Offshore field development has a long investment cycle, and the shortfall will not be filled up before the end of this decade.
- Libya's production has reached 780,000 b/d, which is the highest since October 2014. As Libya is exempted from OPEC's production cuts due to disturbances in the country, this development adds pressure to OPEC's expectation of production cuts for rebalancing the market.

- The decision on OPEC cuts and the price of the barrel coming up to above \$50 must have helped Venezuela somewhat as the country had been in a tight financial situation. The US happens to be the biggest buyer of Venezuelan crude (741,000 b/d sent to US in 2016). PDVSA, the national oil company has \$3.7 billion in debt, and due to the falling crude prices, the company has been struggling to pay creditors over the last few years. But the recent announcement by Venezuelan President Nicolas Maduro to rewrite the constitution could trigger fresh US sanctions, and if it happens, Venezuela will be hit hard.
- The Offshore Technology Conference (OTC) was held in Houston from May 1 to 4, where over 64,700 professionals from 100 countries participated. Some of the subjects touched upon in the technical sessions included how deep water projects can compete with shale developments, role of automation in increasing on-site safety and new ways to utilize AUV (Autonomous Underwater Vehicle) technology.

So much for the industry news this week.

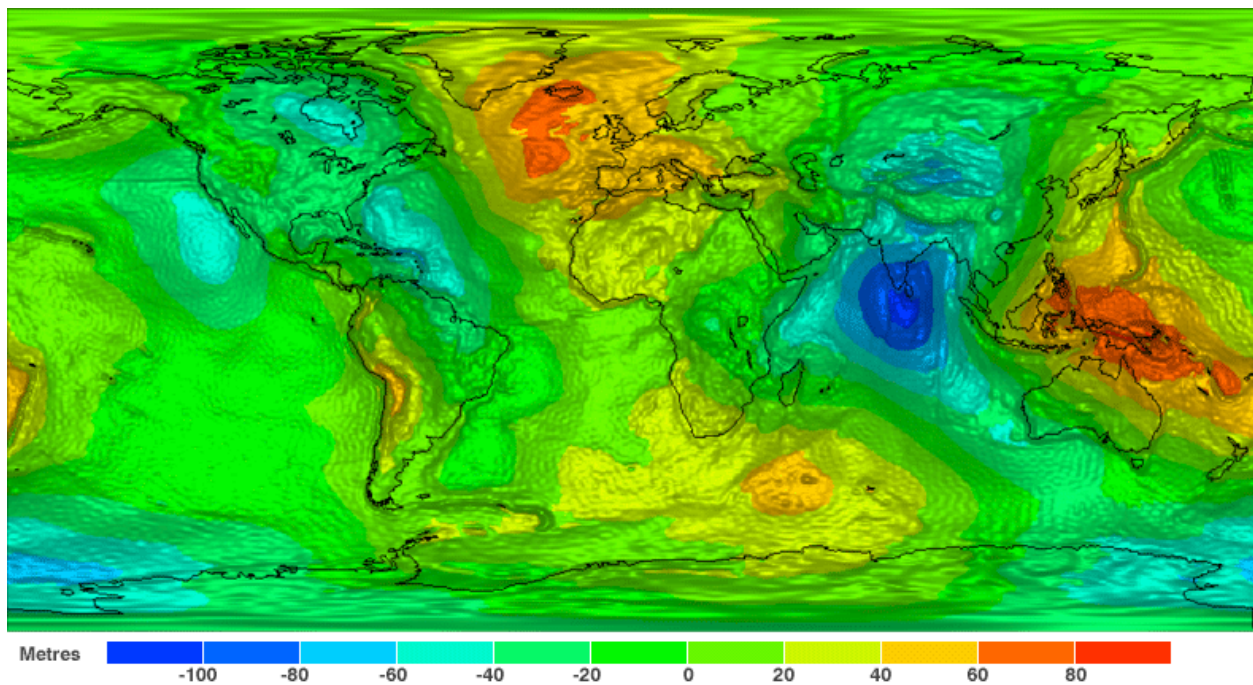
For the lighter side this week

On 17th March, 2009, the European Space Agency (ESA) launched a low-altitude satellite GOCE (Gravity field and steady-state Ocean Circulation Explorer) with the main goal of mapping the Earth's gravity with high accuracy and detail. The satellite collected data at 255 and 235 km above the Earth with a gravity gradiometer that could sense the smallest gravitational changes (1 part in 10,000,000,000,000). These heights were 500 km lower than most Earth observation satellites and thus improved our understanding of ocean circulation, sea level, ice dynamics and Earth's interior. The satellite was 5 m long, weighed 1100kg, had fins (5m x 1m) to stabilize the spacecraft as it travelled in the residual atmosphere at that height, and carried fixed solar panels.

Scientists have used the gravity measurements from the GOCE satellite to geothermal variations on the Earth. Areas within the Earth's subsurface that range from 60 to 200°C suggest the maturity of the rocks and could indicate the likelihood of oil and gas. Besides this, GOCE mapped the deep structure of the Earth's mantle and also explored volcanic regions. All these results have led to greatly improved knowhow about different aspects of the Earth. The GOCE mission ended in October 2013, when the satellite ran out of fuel, reentered the Earth's atmosphere and burnt out.

The ESA was able to produce a high-resolution of the Moho from the GOCE data. Moho (named after the Croatian seismologist Andrija Mohorovičić, who discovered it in 1909) represents the boundary between the Earth's crust and the mantle, and exhibits a change of seismic speed at that interface. The depth of the Moho varies from 70 km in the mountainous areas to 10 km beneath the ocean floor.

Using the GOCE data received initially, ESA prepared a map of Earth's gravitational effects and shows the variations as seen in the map below. It shows low values in southern India and Indian Ocean and higher values in and around Iceland. The map is called geoid, a surface at which at any point the gravity is perpendicular to it. Even though it shows changes of as much as -100 to +100m, it is not interpreted as depressions and elevations. These changes are due to density heterogeneities in the subsurface, and have a direct bearing on the physical and chemical properties of deep mantle and processes that give rise to mantle convection, plate tectonics, etc.



<http://news.bbc.co.uk/2/hi/sci/tech/8767763.stm>

Various interpretations have been offered for the lows seen in the southern India, but no definite explanation has emerged so far. We will probably hear about it in the future.

Did you know?

A cow gives nearly 200,000 glasses of milk in her lifetime.

I hope you find this interesting.