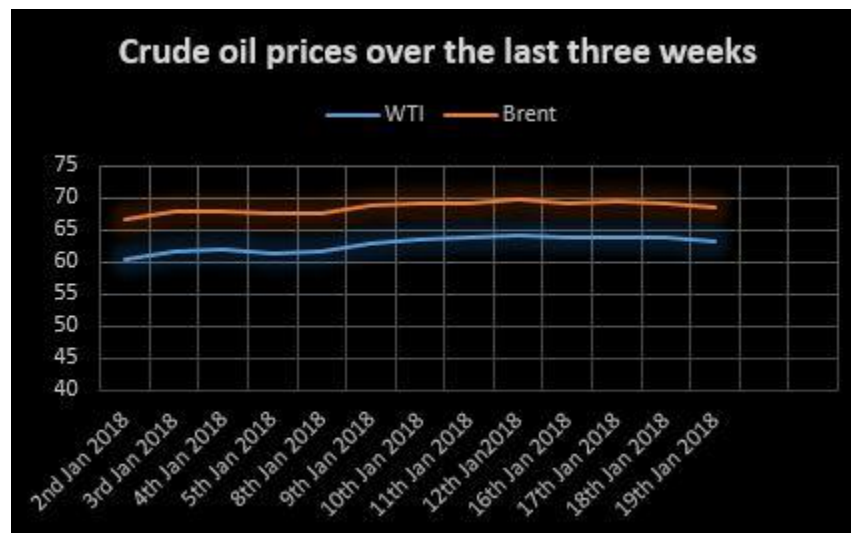
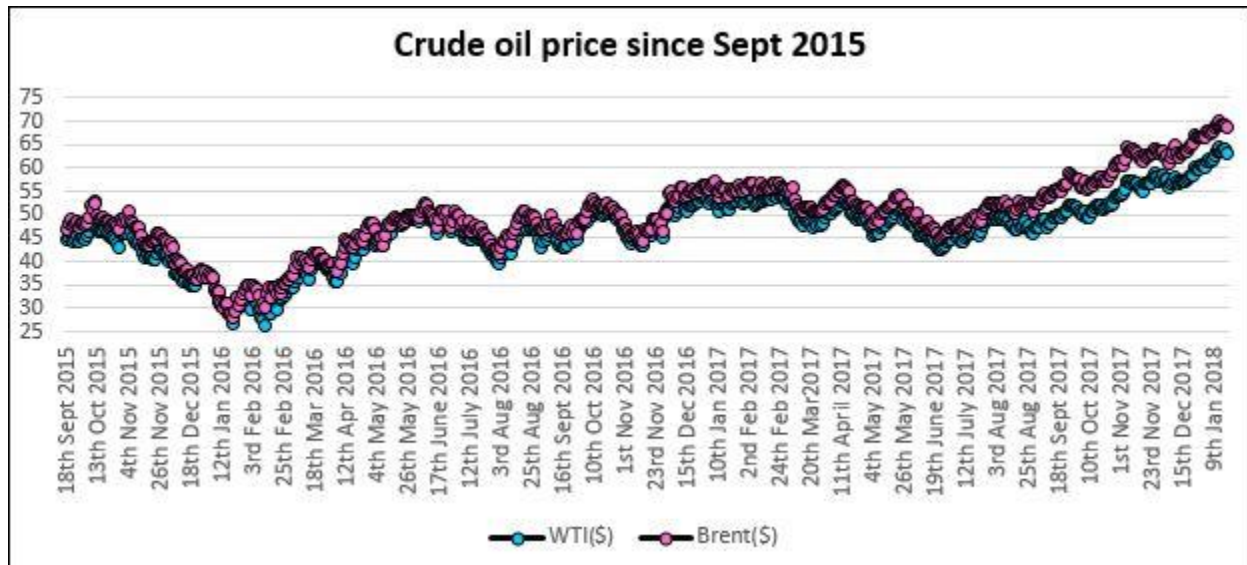


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- The price of the barrel rose to \$64 for the first time in three years, with the demand climbing for the winter, and the supplies tightening up. The oil stockpiles, which receded in 2017, and might continue to show as such for the next month or so, but they should start building up again in the first half of 2018. The other thing to keep in mind is that supply disruptions in December, such as the North Sea pipeline halt, and the pipeline explosion in Libya have been resolved. Though as some analysts predict, Venezuela and Nigeria remain vulnerable. And finally, the imminent political dangers have receded somewhat for the present, such as Saudi crackdown on corruption, street protests in Iran and President Trump stopping short of tearing up the Iran nuclear accord. After climbing to \$64, the price of the barrel slipped as the week before last saw

the US rig count increase by 10, the biggest since June 2017. Besides, there has been speculation that crude prices rose too quickly in the past several weeks.

- As per IEA, a steep rise in the US crude production will be seen in 2018. This prediction lowered the price of the barrel last week. The EIA data also showed the biggest gain in US production since October. Such an increase in production is expected, when the price of the barrel goes too much above \$60, prompting apprehensions that OPEC members and Russia end their production cut agreement earlier than the end of 2018. It is expected that the crude growth in the US is going to be explosive, there will be substantial gains in Canada and Brazil, and these will outweigh any decisions in Venezuela and Mexico.
- Iraq has joined UAE, Qatar and Oman in calling for OPEC and its partners to abide by their production cuts agreement, despite the price gain in recent weeks. These members opine that the OPEC deal has contributed to stability in the oil market, and any talk of ending the deal is 'wrong judgement'. Any small increase in oil production by OPEC and partners may end up as a sizeable loss of revenue for them. Kuwait's oil minister said OPEC and other global oil producers including Russia will not be discussing any premature termination to their deal in their meeting this last weekend, and that they are committed until the end of 2018.
- What could we look for in 2018?
 1. The breakeven cost for many US shale players has dropped (below \$50) over the last few years, thanks to processes and technologies, that they have implemented. So, as the price of oil remains above \$60, US production will increase, and we can expect to see that in 2018.
 2. The costs will rise. The last few years have not been very kind to the service companies. Now that the oil prices have returned, the demand from investors for increased returns on their investments, will prompt many shale explorers to complete the wells that have been drilled but not completed for service. This will increase spending in 2018. In addition to this, since late June 2017, there has been a 50% increase in the price of crude oil. This has gradually resulted in an increase in demand for the fracking service companies such as Schlumberger, Baker Hughes, and others. A key driver has been the complex hydraulic fracking these companies have developed the technologies for. The prices for fracking jobs rose by 30% last year and are expected to grow by another 5 to 10% this year.
 3. As companies continue their drive to bring costs down, they will put more emphasis on embracing digital solutions. The last year saw a lot of talk and discussion on digital enablement, and this has brought clarity to many companies about how they can be implemented, as it is here to stay. This could make 2018 the digital revolution take-off year.
 4. The demand for natural gas has been rising, and as more coal-powered generation switches to natural gas, this trend will continue, and so 2018 may see the growth of natural gas.

So much for the industry news this week.

Did you know?

I recently stumbled across the story of 'AlphaGo'. Pardon my ignorance, but I had never heard of the game 'Go'. So, first I read about the game, which originated in China more than 2500 years ago, and later reached Korea and Japan. It is a board game for two players, just like chess. The playing pieces, black for

one player and white for the other, are called stones. These stones are to be placed on grid lines marked on the board, which is somewhat larger than the chess board. The game ultimately aims at surrounding more territory than the opponent. As the stones are placed on the board, if they are surrounded by the opponent's stones on orthogonally opposite points, they are 'killed' or 'captured', and must be removed from the board, thus conceding territory. The game continues till neither player wishes to make a move, or if one of the players resigns. Go is played in China, Korea, Japan, Taiwan, US and Europe.

Like chess, Go is a strategy game. Besides the fact that Go is played on a 19 x 19 board compared with an 8 x 8 board for chess, Go is considered several orders of magnitude more complex than chess, just because of the large number of possible ways in which a single stone move can impact and affect the whole board spread.

AlphaGo is the first computer program that was developed by DeepMind, a company founded in 2010 in London, and backed by some successful technology entrepreneurs in the world. It is the world leader in artificial intelligence research and its applications, and developing programs that can learn to solve complex problems with and without needing to be taught how. It is working with experts in different fields to make meaningful and significant breakthroughs. In line with its mandate, it has endeavoured to implement their research in the field of games as well. By using the training on Go games played in the past, DeepMind developed a program called AlphaGo that taught itself how to play using neural networks. DeepMind was acquired by Google in 2014, and has research centers in Edmonton and Montreal in Canada, and in Mountain View, California, besides London.

DeepMind shot into fame in March 2016, when it arranged a match between AlphaGo and Lee Sedol at Seoul. Lee Sedol is a South Korean professional Go player, who had 18 international titles to his name at the time. Lee played a five-game match against AlphaGo for a 1 million match prize, and lost 1-4. There is a documentary on this match called 'AlphaGo', which is very interesting and is available on YouTube and Netflix. I recommend watch this as I did, to understand more about the game and this about how the match progressed game by game.

To be able to evaluate the best possible move on the board, considering all the different moves that are possible in a finite time, requires extraordinary and creative ways in developing a program that can do this. AlphaGo trained on hundreds of human amateur and professional games to learn how to play. Since then DeepMind has improved on this approach. It's next updated version AlphaGo Zero skips this training step, and learns to play simply by playing games against itself, starting from completely random play. This version quickly surpassed human level of play, and defeated the champion-defeating version of AlphaGo by 100 games to 0.

With the progress being made in the algorithms behind AlphaGo, the scientific community has started thinking about the future impact of machines with general purpose artificial intelligence.

Talking about our oil and gas industry, we are also talking about machine learning applications in geoscience. In fact, we have already been using machine learning in applications such as linear regression, spatial interpolation and seismic inversion. We will be witnessing more of these and other applications in the next few years, and get into exciting times.

I hope you find this information interesting. So much for this post!

Till the next post, stay safe and happy!