

A Study on Oil Price Fluctuation and Offshore Oil Production Outlook

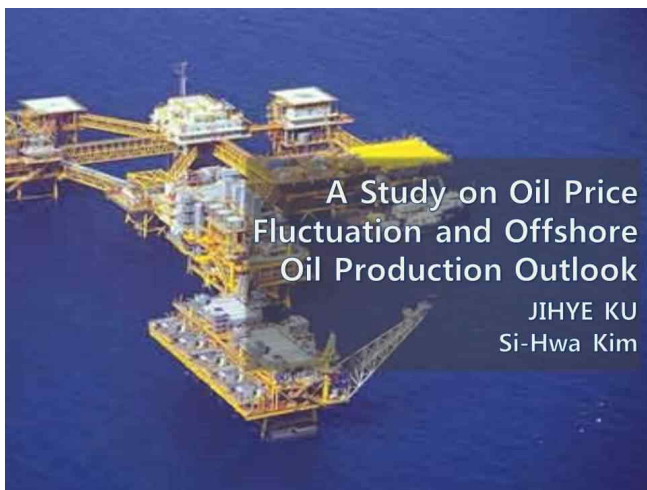
유가변동과 해양석유 생산 동향에 관한 연구

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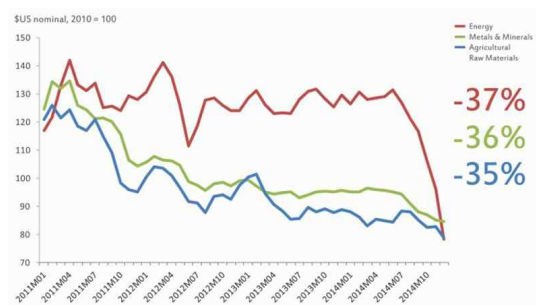
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Abstract : *Crude oil is the world's most actively traded commodity and also one of the most significant resources in the world. The impact of oil price volatility has great influences on macroeconomic activities. This presentation is to review and analyze the oil price fluctuation and to examine the effects especially on the offshore oil production and thereafter to look over the challenges and opportunities in this sector focusing on the petroleum logistics.*

Key words : *Crude oil; oil price fluctuation; Oil price shock; offshore oil production; petroleum logistics*

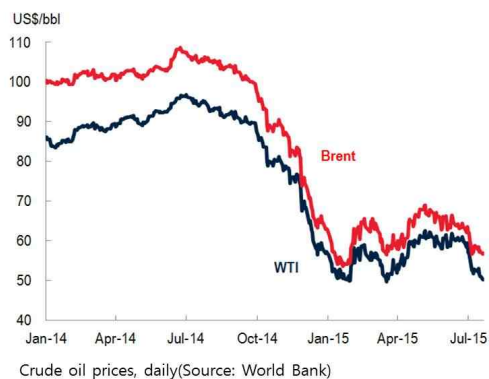


■ Nearly Identical Commodity Decline

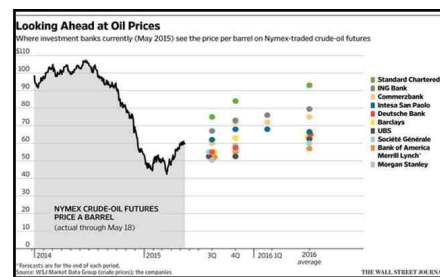


Source: World Bank

■ Introduction



■ Oil Price: What Next?



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■ Different perspectives

- After rallying by about 40% since their lows earlier this year, forecasts now by major banks paint a mixed picture but one that increasingly looks like a W-shaped recovery.
- Some, like Bank of America Merrill Lynch, see prices hovering below \$60 for the rest of the year while others, like Standard Chartered, project a fast rebound to \$90 a barrel by the end of the year.

■ Origin of the causes of oil price shock

- ▶ Hamilton argues that three events that occurred from 1973 to 2007 (the Iranian revolution in 1978, Iraq's invasion of Iran in 1980 and Iraq's invasion of Kuwait in 1990) resulted in the disruption of the flow of oil from key global producers.
- ▶ Hamilton (2008) noted, "it is clear ... that demand increases rather than supply reductions have been the primary factor driving oil prices over the last several years."
- ▶ Hamilton and Kilian stated that we cannot paint a complete picture on the relationship between oil prices and the economy or the financial markets, unless we separate the origins of the oil price shocks.

■ Classification of the origins of oil price shocks [Hamilton (2009), Kilian (2008)]

The origins of oil price shocks can be divided into three groups

- ▶ **Supply-side shock**
Hurricanes may disrupt the stability of the supply-side demand so that suppliers, refineries and oil-related transportation, as well as other non-oil-related energy supply systems are influenced.
- ▶ **Aggregate demand shock**
The 2008 global financial crisis is considered to be the worst economic crisis since the Great Depression of the 1930s. The 2008 crisis resulted in sharp price volatility in the financial and commodities markets. Oil prices suffered severely, and dropped to less than \$30 per barrel in the second half of 2008. The reason for this is that oil demand from OECD countries suddenly slowed down, which skewed the balance between oil supply and demand.
- ▶ **Precautionary demand shock (or oil-market specific demand shocks)**
The Libyan war was an armed conflict that occurred in 2011, which resulted in sharp cuts in oil production (by approximately 90%).
As an oil cartel, OPEC has a mixed influence on world oil prices by regulating oil production among its members.

■ Forecasting the real prices of crude oil

- ▶ **The linear predictive regression**
 - Predictive regressions including oil futures prices [Alquist & Kilian (2010), Coppola (2008), Moshiri & Foroutan (2006)]
 - Predictive regressions including oil production [Baumeister & Kilian (2012, 2014, 2015)]
 - Predictive regressions including oil inventory [Baumeister & Kilian (2012), Ye et al. (2005, 2006)]
 - Predictive regressions including crack spread [Baumeister et al. (2014), Murat & Tokat (2009)]

■ Forecasting the real prices of crude oil

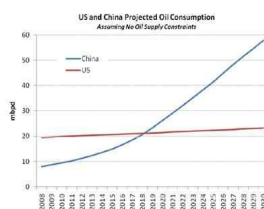
- ▶ Predictive regressions including some high-frequency financial variables [Baumeister et al. (2015)]
The set of high-frequency predictors includes
 - (1) the spread between the spot prices of gasoline and crude oil
 - (2) the spread between the futures price and the spot price of crude oil
 - (3) cumulative percentage changes in the CRB index concerning industrial raw materials
 - (4) cumulative percentage changes in US crude oil inventories
 - (5) cumulative percentage changes in the Baltic Dry Index
 - (6) returns and excess returns on oil company stocks
 - (7) cumulative changes in US nominal interest rates (LIBOR, Fed funds rate)
 - (8) cumulative percentage changes in the US trade-weighted nominal exchange rate.
- ▶ The applications of some nonlinear methods [Xiong et al. (2013), Yu et al. (2014), Zhang et al. (2015)]

■ Long-Term Oil Prices: Goldman Sachs Vs. OPEC

- Goldman Sachs predicts that prices would remain "low" for fifteen years, while OPEC has argued that price should recover to \$80 a barrel by 2020.

→ A few years ago, Goldman was considered the greatest price bull and OPEC actually had one of the lowest long term oil price projections.

- There are huge uncertainties about both fundamentals and geopolitical risk.



→ Without a strong economic revival in China, it will be difficult to develop enough demand to absorb likely increase in OPEC production.

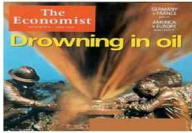
→ China still has large financial reserves and a labor force that should be able to show strong improvements in productivity.

'Were China to follow Korea's path of development - as it largely has to date - oil demand would more than double in the next decade. By 2030, Chinese consumption could exceed 50 mmbpd.'

Source: Douglas-Westwood analysis using EIA, IMF, and US Census Bureau data

■ Long-Term Oil Prices: Goldman Sachs Vs. OPEC

- The breakeven price of shale oil remains unclear; shale gas boomed at prices for below the estimated breakeven price, and shale oil may do the same, but the jury is still out.
- Geopolitically, Libya, Iraq, and Nigeria all have some degree of threats to their oil supply, or actual disruptions, which could resolve or worsen in the next five years.
- Other countries, like Iran, Venezuela, and Algeria are all potentially unstable to some extent, and there still remains relatively small amounts of surplus capacity in the market to offset any large disruption.



March 1999



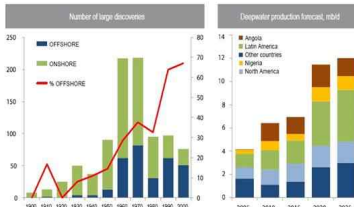
April 2009



The Future?

■ DEEPWATER PRODUCTION

- As traditional onshore reserves are depleted, offshore resources are playing a greater role in supplying the growing demand. The growing interest in shelf resources is illustrated by the fact that over the last 20 years the number of large shelf discoveries has been greater than the number of big onshore discoveries.



Sources: IHS CERA, Statoil presentation to the IEF, LUKOIL estimates

Despite the high cost of production and operating risks, deepwater production will continue to grow.

After 2015, when a number of new large fields will be put in operation, we expect to see significant production growth.

■ Challenges and opportunities

- The offshore industry faces difficult time in 2015
- Oversupply of oil leading to low oil price
- the challenges to offshore from US onshore shale production
- Oversupply of some types of drilling rigs
- High industry costs
- The impact of Macondo



→ At the same time progress is being made on a number of fronts and for some players this could also be a period of great opportunity.

→ The low oil price will increase pressure on deep water projects; however, the viability of these developments is typically calculated over the long term.

→ The industry consensus indicates that an oil price recovery is expected in the mid to long term. While the economic feasibility of deep water fields varies, typically a long-term oil price of USD 80/bbl ensures the viability of the majority of developments.

■ Challenges and opportunities

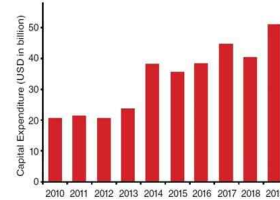


Fig. 1—Global deepwater Capex, 2010–2019. Source: Douglas-Westwood's World Deepwater Market Forecast 2015–2019.

▪ Despite Imminent Project Delays, Deepwater Spend To Total USD 210 Billion From 2015 to 2019

- Douglas-Westwood expects deep water Capex to rise post-2016, driven by the continued development of deep water fields off Latin America and West Africa, as well as new developments off East Africa.
- However, in the short term, delays as a result of the oil price are causing significantly slower growth than was expected a year ago.

■ Challenges and opportunities

- The current low oil price is expected to slow the deepwater market with reduced project sanctioning in the short term. Notably, installations in 2018 are expected to be affected.
- Projects already under construction are unlikely to be affected, but there will be delays to projects that are not sanctioned yet. Consequently, deepwater Capex is expected to be limited in the short term; however, an expected oil price recovery over the midterm will result in increased Capex outlay beginning in 2019.
- Latin America continues to lead investment in deep water activity despite the corruption scandal and Petrobras' ongoing financial struggles. As a result, delays in the delivery of Petrobras' FPSOs are expected.
- Regions such as the Middle East and Western Europe with historically low levels of deep water activity will experience considerable growth over the next 5 years, primarily due to the installation of major deep water trunk lines.

■ Petroleum Logistics

securing the supply chain

- Looking to 2015, one of the challenges the industry faces is securing robustness of the supply chain.



How do you make sure your supply chain is still robust enough to deliver services on long life projects like offshore oil and gas?