Time Lag between Crude Oil and LNG Price Movements

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As is well known, crude oil prices on the international oil market and liquefied natural gas prices, in particular LNG import prices for Japan and other Asian countries, are strongly correlated and accompanied by a certain time lag between their movements. This is because a mechanism has been adopted for LNG prices under long-term contracts for Asian market to be linked to crude oil prices in principle. Long-term contracts still account for a dominant part of LNG procurement in Asia although spot procurement’s share has increased over recent years.

Under the LNG pricing formula for Japan, the LNG price is based on the average CIF crude oil import price called the Japan Crude Cocktail (JCC) price, with some specific coefficients and factors taken into account. On the coefficients and factors, LNG buyers and sellers agree through negotiations. If such details of the formula are agreed on, the LNG price may be automatically calculated in line with the JGC price. In this way, crude oil prices and Japan’s LNG import price have a strong correlation.

But the correlation is accompanied by some time lag. In reality, crude oil prices changes take some five months to be reflected in the LNG import price for Japan. For example, the monthly average LNG import price hit this year’s low in June after monthly crude oil prices reached their lows in January. The monthly average sank to $49.8 per barrel for the Brent crude oil and $47.3/bbl for the West Texas Intermediate crude oil in January, slipping below $50/bbl. Later, crude oil prices rebounded somewhat, with the Brent price rising close to $60/bbl between April and July. Reflecting the January lows, the monthly LNG import price for Japan declined gradually and hit this year’s low of $8.7 per million British thermal unit (MMBTU) in June.

The time lag is attributable primarily to two factors. First, the JGC price represents the price on arrival in Japan and deviates from changing crude oil prices on the international market due to the time required for shipment and transportation. While the monthly average prices for major crude oil brands hit this year’s lows in January as noted above, the JGC price posted its low of $49.5/bbl in February. Second, parties to LNG import have adopted a mechanism to use the JGC
price of about three months ago for calculating LNG prices, although specific details can differ somewhat by each LNG contract.

As a result, LNG import prices in Japan’s customs clearance statistics reflect crude oil prices some five months ago. The result has interesting implications in a sense. Based on daily crude oil price changes, we can anticipate the movements and direction of Japanese LNG import prices for up to almost half a year ahead.

The average Japanese LNG import price rose from the low of $8.7/MMBTU in June to $8.9/MMBTU in July and $9.1/MMBTU in August. In response to the JCC’s rise from $49.5/bbl in February to $64.1/bbl in June, the Japanese average LNG import price may gradually increase, reaching around $10/MMBTU late this year. But we must pay attention to crude oil prices’ falls to this year’s new lows in August.

In August, crude oil prices on the international market plunged as a global stock market decline came on fears about the future Chinese economy as triggered by a Shanghai stock market plunge. In response to the stock market fall, the WTI crude price fell to this year’s lowest level of $38.24/bbl on August 24. The August average stood at $42.9/bbl for WTI and $48.2/bbl for Brent, slipping below January levels. The weakness continued in September, with the average standing at $45.5/bbl for WTI and $48.5/bbl for Brent. The monthly averages slipped below $50/bbl for the third time this year.

What are the implications of this crude oil price weakness? Clearly, it may work to lower LNG import prices for Japan. The monthly LNG import price is thus expected to fall back below $9/MMBTU after rising to around $10/bbl. Given a time lag of some five months as described above, the LNG import price is expected to reflect August’s crude oil price plunge around January 2016. In this way, the LNG import price for Japan is likely to start next year at a low level.

Future crude oil prices are growing more uncertain. While low crude oil prices are bringing about a decline in U.S. crude oil output to tighten the supply-demand balance, Iranian crude oil’s comeback to the international market and emerging downside risks for the world economy are working to ease the balance. Crude oil prices may decline further or rise back depending on these factors toward the year-end, implicating LNG prices in the first half of next year.

As a matter of course, actual LNG import prices are influenced not only by JCC-linked long-term contract prices but also by spot LNG prices whose presence has increased over recent years. The supply-demand balance in the Asian LNG market has loosened substantially and is expected to remain loose for the immediate future. But the market always changes. Depending on
spot LNG market conditions including prices, the rise and fall in the actual average LNG import price may be accelerated. We all need to closely watch Japan’s LNG import prices reflecting crude oil prices with a time lag.

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