Frank Asche[1], Petter Osmundsen[2]

LONG-RUN TRENDS IN NATURAL GAS PRICES: INCREASED MARKET INTEGRATION

[1]University of Stavanger, Norway, (47)51832286, Frank.Asche@uis.no
[2]University of Stavanger, Norway, (47)51831568, Petter.Osmundsen@uis.no

OVERVIEW

During the last decade, there have been a number of studies investigating the degree of market integration between different energy carriers with a focus on the price for natural gas [1, 2, 3]. There have also been studies investigating the degree of market integration within the European and the North American market [4, 5, 6]. These studies have in common a fairly short time horizon and the use of high frequency data. While this is certainly useful for studying the market operation, it does not reveal much about long term trends in the market for natural gas.

In this paper we will use annual average prices from the early 1970s for natural gas in Japan, the US and the EU, as well as the crude oil price, to investigate the link between the different regional markets for natural gas, and also their link to the oil price. After the opening of trade with gas between the major markets - commencing with the shipping of LNG - one may expect that the markets have become more integrated.

However, there are also several arguments against this position. In particular, in the 1970s most gas prices were determined in long-term contracts linked to the oil price, thus creating the possibility that the various gas markets already were integrated via the common contract link. Deregulation represents another argument against increasing gas price convergence. The deregulation of the US market in the 1980s, and the commenced deregulation in the EU in the 1990s, created a situation with a possibility of independent pricing of natural gas.

METHOD

We will use annual average prices from 1975 for gas LNG-gas to Japan, import price and then Henrys Hub in the US and the IEA gas price for Western Europe together with the price of Brent Blend converted to natural gas equivalents. We will then analyse the equilibrium relationships between the data series as well as the variance of these relationships using standard econometric techniques.

RESULTS AND CONCLUSIONS

The results indicate that the prices of natural gas in all three markets have followed the same long-term price determination process, and that this pattern has been determined by the oil price. Until 2005, the variation in the gas prices in the different markets - also relative to oil - was reduced, indicating an increasingly integrated market. Hence, there is little evidence that the deregulation of the gas markets in the US and the EU created independent price determination processes for gas in these markets. However, the steep oil price rise in 2005 significantly altered these price relationships. The oil price increased much more rapidly than any of the gas prices, and in the period after 2005 there seems to be no common price determination process between oil and the different markets for natural gas. Moreover, the higher oil price influences the different gas markets differently, with the gas price in the US increasing more than the price in Europe, which again increases more than the price in Japan. This is further evidence that it is the oil price that has created the link between the three regional gas markets. Moreover, it indicates that the pricing process for natural gas is still linked to oil, but to a varying extent.

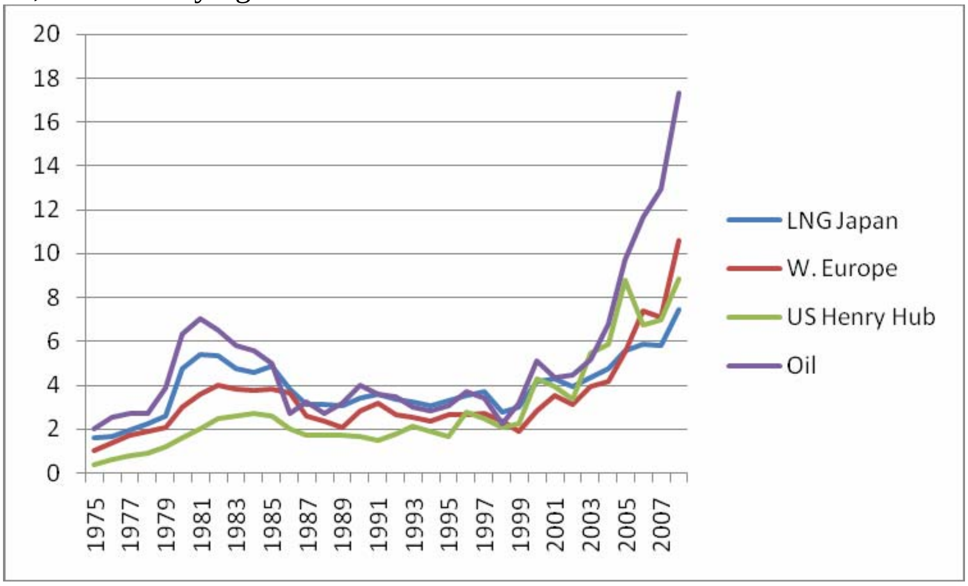

Fig. 1. Natural gas prices and the price of oil

Source: IEA

REFERENCES

1. Asche, F., P. Osmundsen and M. Sandsmark. 2006. The UK Market for Natural Gas, Oil and Electricity. Are the prices decoupled? *The Energy Journal* 27: 27-40.
2. Panagiotidis, T., E. Rutledge (2007). "Oil and gas markets in the UK: Evidence from a cointegrating approach." *Energy Economics* 29: 329–347
3. Bachmeier, L. J. and J. M. Griffin. 2006. Testing for Market Integration: Crude Oil, Coal and Natural Gas. *Energy Journal* 27(2): 55-72.
4. Asche, F., P. Osmundsen and R. Tveterås. 2002. European Market Integration for Gas? Volume Flexibility and Political Risk. *Energy Economics* 24: 249-265.
5. Serletis, A. and J. Herbert. 1999. The Message in North American Energy Prices. *Energy Economics* 21(Oct): 471-483.
6. Silverstovs, B., G. L'Hegaret, A. Neumann, and C. Hirschhausen. (2005). "International Market Integration for Natural Gas? A Cointegration Analysis of Prices in Europe, North America, and Japan." *Energy Economics* 27: 603–615.