C4: THE IMPACT OF OIL PRICE ON ETHYLENE PRICE

What is the impact of rising (or falling) oil price on the price of ethylene? Clearly since ethylene is made from oil derived products such as naphtha by steam cracking, there would be expected to be a positive correlation with the price of oil. Furthermore, the other major feedstock is ethane, which although derived from natural gas, is in most parts of the world linked in someway to the prevailing crude oil price. The nexus between the price of oil and the price of ethylene is thus of considerable interest to participants in the petrochemical industry and most organisations have their own analysis. Here is a simple analysis based on the published spot prices for Brent Crude (data from the US EIA) and ethylene and naphtha on the European market (as reported by European Chemical News and ICIS Chemical Business) from 1989 to 2012. In passing it is noted that the dominant feedstock for ethylene in Europe is naphtha which shows a good correlation with the prevailing price of Brent crude:

![Naphtha and Brent Prices](chart1.png)

The correlation of naphtha and Brent is very good over the range from about $10/bbl to almost $150/bbl oil price with the correlation coefficient $R^2$ almost unity. The data is taken as weekly averages and the tightness of the correlation would suggest that there is no lag with naphtha prices responding almost immediately to the price of crude oil. For ethylene the correlation is as shown in the second figure.

![Ethylene and Brent Prices](chart2.png)

The correlation is not as good with a correlation factor of $R^2 = 0.80$; there is more scatter in the data. Nevertheless, there is a general impact of oil price on ethylene price, which appears to be linear. Clearly other factors are in play such as the possibility of a lag between and change in the oil price and a subsequent change in ethylene price, the state of the business cycle and (since this is EU data) the relative value of European currencies to the US dollar. Note the intercept of $330/t which is the price of ethylene at zero feedstock cost and may represent the average non feedstock operating costs of production.