How Far is Gas from becoming a Global Commodity?

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For decades, energy professionals have predicted that regional gas markets will become tighter and, eventually, will behave like a single, global market. We take the oil market as a benchmark and assess how far gas is from becoming a global commodity. We conclude that not much progress has been made. Gas markets are still quite regional.

Our definition of market integration relies on price behavior. We say that two markets are integrated and behave like one if prices in both markets are very well synchronized.

To define a benchmark, we first look at oil prices of three different markers: WTI, Brent, and Dubai. We confirm what other authors have already concluded. At least since 1990, the oil markets behave like a single market. This synchronism occurs both at high and business cycle frequencies.

We then study gas price synchronization in Europe, Japan, and North America. We study synchronization between each pair of gas markets and between each gas region and the oil market (we consider Brent as the benchmark). Interestingly, each gas market is closer to the oil market than to any other gas market. It is also worth noting that the North American gas market seems independent of the others. Although European and Japanese markets form a cluster, we cannot talk about a single market for these regions. The desynchronization between the European and the Japanese markets is much more significant than between the oil markets.

We also argue that oil is the primary synchronization mechanism between the European and Japanese gas markets. It is not that Europe and Japan are connected; it is that the gas prices in those regions are associated with oil. And, therefore, are correlated with each other. Once one removes the arbitraging effect of the oil price, synchronization basically disappears.

What explains the apparent detachment of the North American gas market? Probably the extensive pipeline network present in the United States, with roughly equivalent gas specifications, with many buyers and many sellers, facilitates an independent market. In North America, gas prices result from local supply and demand, where gas competes with other gas (gas-on-gas pricing). In the different regions of the world, it is common to have gas prices directly linked to oil prices. To be more precise, in Europe, gas prices are a function of energy substitutes, which naturally include oil products. It is common to have pure oil-linked pricing in North Asia, especially in Japan, Korea, and Taiwan. This contract structure may explain several of our results.

In conclusion, it is still not the time for industry strategists to think of regional gas markets as one market. That means that geographical diversification reduces obvious local risks, like political risks, and reduces exposure to price shocks. The fact that our analysis is frequency varying allows for portfolio managers to adjust their choices to their clients' time horizons.

Our results reinforce the need to decouple gas pricing from oil prices in Europe and Japan (especially in the latter case) for policymakers. Given the typical contract structure of gas transactions, an increase in oil prices will increase gas prices, possibly leading to overpriced gas, which will hurt consumers. Moreover, a policymaker may prefer that gas consumption share increases

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because of environmental concerns while oil decreases. Such substitution is difficult if the prices of both energy sources are tied together. Policymakers may wish to create incentives to redesign gas contract structures.