Will Russian Natural Gas Long-term Contract Prices Remain Oil Price Determined after the End of Oil-indexation?

BY PÉTER KADERJÁK, PÉTER KOTEK, ALFA DIALLO

Until the end of the 2000s natural gas trading in continental Europe had been built on long-term gas sales and purchase contracts (LTC) between major outside gas suppliers – Norway, Russia and Algeria – and European buyers. The dominant pricing scheme of LTCs was oil price indexation. In the last couple of years however the structure and pricing of Russian LTCs have changed due to re-negotiations and recontracting. The objective of this paper is to identify the most important determinants of Russian LTC pricing strategy under the current market conditions. We investigate to what extent Russian long-term contract prices were determined by strategic considerations and Russian market position. We also assess the role of oil price in long-term gas supply contracts.

Compared to previous research our approach is novel in a sense (i) we considered long-term contract price development and price differences in multiple European countries (ii) introduced a new indicator of import dependence and showed its effect on LTC prices.

To assess the pricing of long-term contracts we formulated two hypothesis.

- First, based on the notion that European gas markets are working in a perfectly competitive manner, we argue that the Russian long-term contracts are priced to the closest competitive alternative. The rationale is that Russia's main strategy is long-term profit maximisation and market foreclosure.
- Second, we consider that LTC prices are mainly determined by the market power of the incumbent – in our analysis Russia. To grasp the market power element we formulate an indicator and assess its effect on LTC prices.

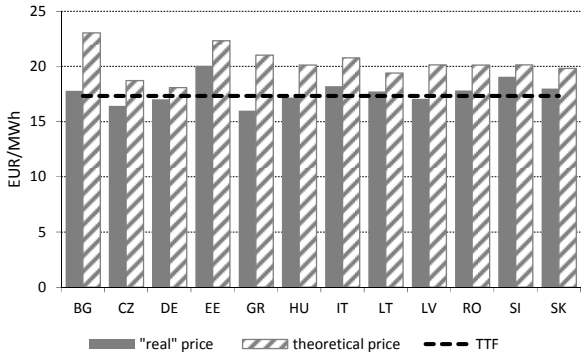

Figure 1. The relationship between real and theoretical LTC prices in 2017

Source: Authors' own calculation based on Eurostat data and REKK's data gathering.

Peter Kaderjak (pkaderjak@uni-corvinus.hu) is a senior research associate at REKK, Corvinus University of Budapest. **Peter Kotek** (peter.kotek@uni-corvinus.hu) is a senior research associate at REKK. **Alfa Diallo** is a research associate at REKK.

To test the first hypothesis, we used the LTC price data of 12 countries in 2016 and 2017. The price of the closest competitive threat, referred to as "theoretical price", is estimated as the sum of the price of the relevant competitive source and the transportation cost. By looking at 2016 data we can conclude that in the Western and Central European region the presented hypothesis holds. However, these findings seem to be accidental if we compare them with the 2017 (Figure 1) numbers. We argue that Russia indeed accommodated its pricing strategy because of the increasing competitive pressure, as there is a continuous convergence between LTC prices and TTF. On the other hand, data do not support the hypothesis that LTCs are priced as the closest competitive threat plus transportation cost as in practice Russian LTC prices are significantly lower that this hypothesis would indicate, and very small cross-country differences are identifiable.

For the second hypothesis, a novel market power indictor was formulated. Our general hypothesis was that the market power of Russia in a country is determined by the competitive pressure of alternative sources of supply. Formally:

$$(1)\quad E_{i,t} = \frac{C_{i,t} - P_{i,t} - I_{max_{i,t}}}{C_{i,t}}$$

where i represent the different countries, while t the different years (2010-2017). C stands for the annual consumption level, P is the annual production, while I_{max} is the maximum import capacity per year from non-Russian source. The domestic production P affects the exposure index negatively: the higher the domestic sources of gas, lower the exposure index. Similarly, the alternative import capacity from non-Russian sources has a negative effect on the exposure index: the more alternative sources are available for a country

to import, the less exposed it is to a single supplier. The effect of consumption is positive, but considerably weaker than the other two variables.

We were interested about the effect of E-index on the spread between LTC and TTF prices. Our main specification was the following:

$$(2)\ ltc_{i,t} - ttf_t = \alpha + \beta_1 * eindex_{i,t} + \beta_2 * brent_{i,t} + v_i + \rho t + u_{i,t}$$

where ltc is the long-term contract price while ttf is the average TTF price in EUR/MWh , $eindex$ is the indicator defined in equation (1), $brent$ stands for the price of a barrel of crude Brent oil in EUR/barrel, v_i is the country-fixed effect, t represents a linear time trend, while $u_{i,t}$ is the error term.

VARIABLES	(D) LTC-TTF	(E) LTC-TTF	(F) LTC-TTF
Eindex	1.030***	0.574**	-0.161
	(0.241)	(0.200)	(0.215)
Brent		0.0953***	0.0516***
		(0.0218)	(0.0159)
Time trend included	NO	NO	YES
Observations	96	96	96
R-squared	0.136	0.285	0.477

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 1. Regression results with LTC-TTF spread as dependent variable

Brent crude effects turned out to be significant in all model specifications. In all of our specification its coefficient was significant, even when we tried to explain the LTC-TTF spread. The inclusion of time trend did not affect this observation. This means that even in a period, where oil indexation mechanisms are being replaced the role of oil remains important via direct channels: as in some countries at least partly oil indexations remained in place and indirect channels: the hub price itself is affected by oil price.

Additionally, we found weak evidence that dependency rate affects the LTC price of a country. Based on our regression analysis we measured a difference of 0 to 0.6 EUR/MWh between the LTC mark-up of a totally dependent (E=1) and fully independent (E=0) country. Our theoretical maximum effect (0.6 EUR/MWh) can be considered relatively high as it accounts for more than one quarter of the average deviation from the mean of LTC prices of all investigated countries in the whole 2010 to 2017 period.

Plenary Session 1: Energy in Emerging and Developing Countries

Summarised by Jan Eise Fokkema, PhD Student, University of Groningen

The plenary session on energy in emerging and developing countries was chaired by Noë van Hulst, Ambassador of the Netherlands to the OECD and Chairman of the Governing Board of the IEA. She was joined by Timur Gül, Senior Energy Analyst at the IEA; Zhang Xilian, Professor and Director of Institute for Energy, Environment and Economy, Tsinghua University, Beijing, China; and Chandra Bushan, Deputy Director General of Centre for Science and Environment, New Delhi, India.

The three speakers combined a holistic view on energy access in developing countries with a more detailed outlook on how energy policies and trends in China and India have enabled increasing the share of renewables and energy access in remote areas.

Timur Gül showed progress in worldwide energy access, even though Sub-Saharan African countries have been projected to lag behind in the future. Therefore, new policies were presented that included decentralized solar panel solutions and grid extensions.

Zhang Xilian discussed successful policies for rural electrification in China which included community and household solar panels. He attributed their success to political will, adequate public finance and coordination among decentralized government agencies.

Chandra Bushan discussed several trends which enable India to increase its share of renewable energy that included the decreasing cost of renewable energy and storage and the important role of electricity.