POLICY MEASURES TARGETING A MORE INTEGRATED GAS MARKET: IMPACT ON PRICES AND ARBITRAGES

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Overview

The liberalization of the European gas market, being a prerequisite for the integration, is ongoing and policy makers need to find efficient measures aiming at an increase in liquidity on gas trading hubs. We consider a merger of gas trading zones as an example of such policy and examine the efficiency of its implementation. In particular, we focus our analysis on the French gas market and estimate the impact of this policy on price behaviour and on arbitrage activity. Taking into account planned measures to further merge gas trading zones in the future, we try to answer the question whether the merger of two French zones has helped to get a more integrated national gas market.

Currently there are two gas trading regions in France, the Northern one, benefiting mostly from pipeline supply and historically more liquid, and the Southern region, recently extended by a merger of two southern gas hubs, dependent on relatively more expensive liquefied natural gas (LNG) imports. Large price differentials have been observed during periods of insufficient LNG supply. The decision to merge two southern zones has been taken in order to equilibrate the Northen and Southern markets, bringing the prices in the South down until additional infrastructure will be built.

We analyse the prices as well as spatial arbitrages between Northern and Southern gas hubs by applying two methodologies. At first we test the price cointegration and look at the dynamics of pairwise price differentials through an autoregressive model in order to test the law of one price. Then we study the impact of the policy by using an extended parity bounds model of trade regimes. As such, we estimate by the maximum likelihood method the probability to be in a particular trade regime and test whether the situation has been changed after the merger of gas trading zones. Finally taking into account the North/South gas flows and pipeline capacity constraints, we determine the relation between founded arbitrage regimes and the infrastructure load rate.

If the first econometric method gives us an empirical estimation of the policy impact on French gas prices, the second method, which has not been applied to the research on gas market integration, confirms the results by a theory based spatial equilibrium model.

The paper is organised as follows: the introduction characterises the French gas market and explains the policy decision to merge two gas trading zones. The second section describes the data. The third section provides an autoregressive analysis. The section four deals with the parity bounds model.

Methods

In order to understand the price behaviour and to verify the law of one price we test for a cointegration relation between Northern and Southern gas prices. Then, following Cuddington and Wang (2006), we study the price spread for stationarity and estimate an autoregressive model before and after zone merger. Then, we rely on the theory of spatial arbitrage regimes of Sexton et al. (1991) and extended parity bounds model of Barrett and Li (2002), based on maximum likelihood estimation. According to Negassa and Myers (2007), we introduce a dummy variable for the policy and test the hypothesis of a change in probability to observe a particular trade regime after the merger of trading zones. In addition, we integrate a Bayesian approach of Kleit (2001) that consists in a correction for serial correlation in order to deal with inter-period linkages existing on the gas market.

Results

The applied methodologies allow us to see the impact of the merger of gas trading zones on the degree of market integration. The first approach allows us to detect changes in market behaviour after the extension of the South

trading region. The second approach confirms the results and reveals that the probability to observe a particular trade regime has been changed. In particular the model gives a higher probability to observe integrated equilibrium regime after zone merging, that indicates an increase in liquidity in the South trading zone. These results demonstrate a positive impact of the policy implementation.

Conclusions

We apply the autoregressive and the parity bounds model approaches to study the degree of gas market integration and the impact of policy measures using market prices and trade flows data. The French example allowed us to estimate the impact of a merger of trading zones on price behaviour and arbitrage activity with relatively new methodologies applied to the gas markets. The application of these methods can open a new page in the assessment of policies and will be useful taking into account European initiatives to get an integrated and liquid gas market.

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