



Not so *Rough*?

Quantifying unilateral effects through merger simulation

Perhaps the most important modern trend in merger control has been a movement from vague argument to precise quantification. Centrica's acquisition from Dynegy of the largest gas storage facility in the UK (the 'Rough' depleted gas field), recently investigated by the UK Competition Commission, well illustrates how empirical analysis can remove 'unilateral effect' concerns arising from a merger. 'Unilateral effects' – or 'non-coordinated effects' in the European Commission's new Guidelines on the Assessment of Horizontal Mergers – are price increases that arise because the merger eliminates some existing competitive constraint that had been 'holding back' the merging parties' price ambitions.

The concern

Demand for gas is highly seasonal, and UK suppliers have a number of options to meet this challenge.¹ Reflecting its large share of gas sales to final users (via its British Gas supply business), Centrica both owns and contracts a wide portfolio of 'sources of flexible gas' to meet requirements at times of peak demand.

Centrica's acquisition of the Rough gas storage facility, which is also used by other gas suppliers, producers, users and traders, was viewed by both the sector regulator Ofgem and by the Office of Fair Trading as complex and problematic, and after consideration referred to the Competition Commission (CC).²

The concern was that the acquisition would have given Centrica both (a) the *incentive* to increase the price of storage 'units' in Rough (by raising the wholesale price of gas in winter, on which Rough prices are in turn based); and (b) the *ability* to do so by 'withholding' some of its flexible gas. The possibility was raised of wide-ranging behavioural undertakings to effectively regulate the use of Centrica's sources of flexibility; or alternatively, divestment of Rough.

A typical unilateral effects concern, with twists

The case against the deal was a classic 'unilateral effects' concern, with a few extra twists.

When assets previously under separate ownership come together through merger, competition between them is eliminated. Whatever constraint they were imposing on each other's prices beforehand is 'internalised': higher prices will mean losing some customers, but at least those who would have been lost to the merging partner are not 'lost' anymore. In addition, rivals may also find it profitable to increase their price in response to a price increase by the merging parties. These factors change the trade-off relative to the pre-merger situation: when considering whether to raise price, it is possible that the higher profit earned on remaining customers will outweigh the profit foregone on lost customers.

The key question raised by the acquisition was whether bringing

Rough together with Centrica's other flexibility instruments would have given Centrica the profit incentive (and the power) to raise prices. The competition concern was that Centrica would benefit from an increase in the price of Rough services (which it would continue to sell to third parties) and that this would provide the profit incentive to manipulate the wholesale price of winter gas.

The story was complicated by a couple of further 'twists': first, there were existing regulatory constraints on any owner of Rough that would have actually prevented Centrica from directly restricting the supply of Rough services to raise its price; however, Centrica also owned or controlled other sources of flexibility, and could potentially increase the price of winter gas by manipulating these. Second, although Centrica is a net buyer of gas in winter (to meet its customers' demands) it would not suffer from higher wholesale gas prices because it could 'pass through' the increase to customers in any case. Indeed Centrica could even in theory benefit from 'raising rivals' costs', to the extent that other downstream suppliers also purchased Rough storage to meet their flexibility requirements. There was thus also an interesting vertical dimension to the question.

'Plausible' stories are not enough

But even if a concern appears superficially 'plausible', decisions need to be based on appropriate quantification of the alleged effects. It was plainly not enough to observe that Centrica controlled a wide portfolio of other flexibility instruments (including gas fields, interruptible contracts, etc.) and it was still a large gas supplier to final users (particularly residential customers), to conclude that it would be likely to benefit from an increase in the price of Rough services; and that it would be able to bring about such an increase. Because of the nature of differentiation, shares of 'flexible gas' were difficult to measure in a meaningful way, and were not particularly informative of the nature of competition.

The CC's four month investigation into the acquisition of Rough focused precisely on the issue of quantification: what would be the *net* benefit to Centrica of bringing about an increase in the price of Rough storage? How much would it cost Centrica to put a 'squeeze' on its share of the available flexible gas, in order to drive up prices for Rough's services? Would this likely be outweighed by the benefit of the higher price on the sale of Rough's services to traders, producers, and rival downstream suppliers?

To address systematically a unilateral effects question such as this we need a reliable estimate of the elasticity of demand for the merging parties' products (from past price and quantity data), in order to work out the volume effect of a price increase; and to understand its cost function, in order to work out the impact on costs (and therefore profits) of the restriction in supply required to increase prices. By estimating each of these pieces with respect to a hypothetical increase in the price of Rough services, Lexecon provided evidence that undermined the concern that restricting flexible gas in order to raise the price of storage in Rough would inevitably have benefited Centrica.

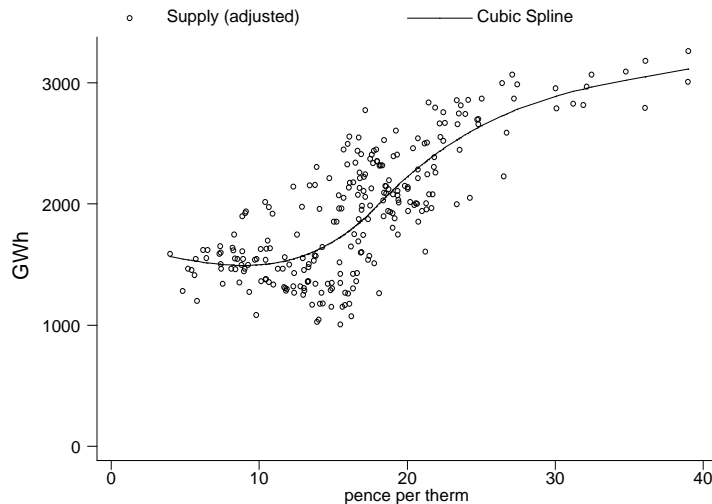
Measuring the volume effects of a price increase

First, we asked how much of its own flexible gas Centrica would need to hold back in order to generate an increase in the winter

¹ For example, producers ramping up production at North Sea gas fields, buying gas in the spot market, re-gasifying stored LNG, using gas stored up during the summer in depleted reservoirs, reversing the flow of gas normally going to the Continent through the Interconnector, or pre-arranged interruption of the flow to certain large customers.

² Lexecon advised Centrica through the OFT and CC investigations.

gas price of – say – a penny per therm (translating approximately to a 10% increase in the price of Rough storage). To estimate this, we needed to take account of the supply response of other producers as market prices rise (i.e. what we care about is the elasticity of the *residual* demand facing Centrica). We also faced the technical problem that as the gas demand curve is constantly shifting, it cannot be satisfactorily ‘identified’. We dealt with this by making conservative assumptions on the elasticity of total market demand, and then backing out the elasticity of Centrica’s residual demand by combining these assumptions with an estimate of the elasticity of third party supply – taken from the estimated residual supply schedule illustrated below – at the appropriate price.



Based on these calculations, we established how much of its sources of winter gas Centrica needed to ‘keep off the market’ in order to obtain an appreciable increase (approximately 10%) in the price of a unit of Rough storage.

Measuring the cost of the ‘hold back’ strategy

But ‘holding back’ one’s own supplies of winter gas, in order to push up winter prices, also has a cost. Centrica’s role as a major supplier to the downstream market meant that if it decided to ‘sit’ on its own sources of winter gas it would have to buy replacement gas from the open market in order to meet its customers’ demand. This had two aspects: first, an ‘opportunity cost’ element – by failing to make use of its own sources, Centrica would waste part of the value of those sources; and second a direct effect on Centrica’s procurement costs, as Centrica is ‘short’ of gas in peak winter periods and has to buy it in from third parties.

We calculated the *opportunity cost* for each source in Centrica’s ‘flexibility portfolio’, that Centrica would have to hold back to push winter prices up by a penny per therm (e.g. the difference between a contract price and the market price of gas, but also taking into account the lower value of gas taken at other times of year, lost opportunities to arbitrage UK and Continental prices, etc.).

Calculating the effect on Centrica’s *procurement costs* was significantly complicated by the need to take into account ‘pass-through’ effects. Given its substantial sales in the downstream market, an increase in wholesale gas prices of a penny per therm would have had a large negative impact on the procurement costs of Centrica’s retail arm (for instance, several gas purchase contracts with third parties are indexed to market prices). On their own these higher procurement costs would have easily exceeded the increased profit at Rough. However, the impact would have been significantly less if Centrica could simply pass through these higher costs to its customers. To take an extreme case, if Centrica could pass on the entire increase in procurement costs, then it would not suffer from the wholesale price increase

(beyond a small demand reduction).

The net effect

The direct benefit to Centrica of a penny per therm more on winter prices would have been an increase in the value of Rough storage of the order of £10 million per annum. The assessment of the net effect rested on three key empirical questions that determined the cost to Centrica of making this happen: the elasticity of Centrica’s demand for gas, the opportunity cost of holding back sufficient winter gas to generate the price increase, and the ability to pass on higher procurement costs to customers.

The analysis of the elasticity of Centrica’s demand indicated that in order to attain this benefit, Centrica would have had to hold back a few hundred million therms of its own gas. The opportunity cost of doing this was substantial. In addition there was the effect on its procurement costs. A controversial issue turned out to be the extent to which Centrica could actually pass this through. In practice there are a number of reasons why Centrica may not be able to pass on cost increases in full, especially to the residential gas market (including reputation risks and uncertainty); and indeed, based on evidence since removal of price cap controls from the domestic market, pass-through does not appear to exceed 30-40%, implying a substantial cost borne by Centrica itself. Putting all this together, we calculated that the net present value to Centrica of the alleged strategy over the next five years would have been a significant negative number, under most reasonable assumptions.

The CC conducted its own analysis and closely tested the Lexecon model. Finally the CC cleared the acquisition, stating that “there is not a sufficient basis for concluding that Centrica may be expected to withhold capacity, as a result of the merger, in order to increase wholesale prices.” On pass-through, the CC agreed that high levels were “inconsistent with [Centrica’s] pricing behaviour over the last few years.” Remedies were limited, and included none of the substantial measures initially thought to be required to address a serious horizontal concern.

Conclusions

To address plausible – but non quantified – concerns about Centrica’s incentives and ability to drive up the price of storage in Rough, Lexecon’s analysis measured in detail the costs and benefits to Centrica of the required strategy. Such a calculation was complex, not least because of the diverse nature of flexibility, and because Centrica is both a supplier and a user of flexible gas.

Lexecon’s report (of which a full non-confidential version can be found as appendix 5.5 of the CC report) demonstrated that the feared strategy could have been profitable only under seemingly unrealistic assumptions. Any attempt to manipulate existing flexibility sources to increase prices at Rough would be at best highly risky, and at worst would generate a significant loss for Centrica. It therefore seemed implausible that such a strategy would be pursued.

The *Centrica/Dynegy* case emphasises the importance of detailed empirical analysis in rebutting generalised unilateral effects concerns arising in mergers. Specifically, the case demonstrates how such analyses can be applied even where there are limitations in the available data, and where account must be taken of complex vertical industry structures. The analysis also benefited from a constructive relationship between the CC’s own economists and those advising the parties. During the inquiry, Lexecon and the CC’s economists commented on each other’s modelling. Such discourse can be valuable in focusing the debate on the core competition concerns of a case, and on practical solutions to address such concerns.

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