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Market Power in Electricity Mergers

The pros and cons of the Pivotal Supply Index

Competition authorities use concentration measures to identify market power. These include market shares, the *n*-firm concentration ratio, and the Herfindhal-Hirschman Index (HHI). But these fail to capture the complexity and special features of electricity generation markets. For these reasons, regulators have employed the Pivotal Supplier Index (PSI) to capture the way capacity constraints may give generators market power. The PSI has been widely used by the US Federal Energy Regulatory Commission (FERC) in market power assessments. It has now migrated to Europe. The Irish Commission for Energy Regulation (CER) has used it in assessing the quantities of wholesale power contracts which should be released by dominant generators, while the Netherlands Competition Authority (NMa) has extended its application to evaluating mergers. It is this latter application which we critically assess here.

Why another index?

The electricity generation sector has a number of structural factors that are inherent and explain industry performance and prices. These include:

- short-term generation capacity constraints which create scarcity during system peak
- transmission capacity constraints which may create narrower geographical markets during system peak
- relatively inelastic demand in the short-term and highly inelastic demand at system peak

These factors can result in market power but equally simply reflect underlying supply conditions which result in capacity constraints. In the latter case ownership and operation of peak capacity would not indicate competition concerns and intervention would simply impede the role of prices in mediating demand and supply, and signalling the need for investment in new capacity. Clearly a measure which could distinguish market power from competitive behaviour would be extremely useful. Hence the attraction of measures such as the PSI.

PSI Defined

The PSI, also known as the supply margin assessment, measures the degree to which a particular generating company is pivotal to serving demand in a trading period. A generator is deemed pivotal when its capacity is necessary to cover demand during a given period if the capacity of all other generators is not sufficient to meet demand. The PSI takes the value of 1 when a specific generator is pivotal in a trading period and 0 otherwise. The PSI is usually aggregated over a year to obtain the percentage of hours when a generator is pivotal. The PSI thus identifies the extent to which a generating company is pivotal to serving demand and its ability to influence supply and prices in a trading period. This may trigger a concern that the generator is abusing its pivotal position.

Nuon/Essent Merger

To illustrate the use (and abuse) of the PSI consider the way it was employed in a recent NMA merger consultation on the Netherlands electricity market. In a hypothetical proposed merger between Essent and Nuon, a PSI of 70% was calculated. That is for 70% of the peak hours served the illustrative merged entity would have been the pivotal generator. This estimate was then used to propose a remedy that the proposed merged entity divests 4.2 GW of generating capacity. This would result in a zero per cent PSI as the post-merger benchmark.

However, this remedy reveals the inadequacies of the PSI as a tool for merger assessment as it effectively results in a post-merger PSI which is lower than the pre-merger PSI. Using the PSI in this way would effectively rule out any merger involving a firm that was already pivotal in some hours, as an acquisition would inevitably increase the PSI for one of the merging generators. This would block all significant mergers and would not assist in any useful competitive analysis.

This example reveals a major drawback of the PSI in merger assessments – there is no threshold for the PSI that triggers reliable concerns of actual or likely market power.

The PSI currently operates without established post-merger thresholds. It is not clear what a 70% PSI actually means for the proposed merger in terms identifying competition concerns. To be useful a quantitative measure must set out initial thresholds or bands which identify, at least for the purposes of further

assessment, mergers that pose competition problems. This was not done by the NMa. It might be argued that the level of the PSI that indicates a competitive concern varies across different markets and so it is not possible to provide one set of thresholds. While there is truth in this, it is also true that other structural measures, such as market shares and HHIs which are subject to the same general problem, use well established thresholds.

Second, the proposed divestment generated by the application of a zero incremental PSI in the *Essent/Nuon* merger was clearly disproportionate. Indeed it was greater than the capacity increment brought about by the merger itself. The error here was in assuming that the post-merger PSI should be lower than the pre-merger PSI for any one of the merging parties. The correct approach, if one is to use the PSI, would be to calculate a divestment that would remove the increment of the PSI resulting from the merger i.e. the increase from 6% (which is the pre-merger PSI for Essent) to 70% - the PSI of the merged entity. However, even requiring divestments that prevents any increase in the pre-merger PSI would imply the need to divest 3.6GW of generation capacity (equivalent to the size of the smaller of the two merging parties).

The PSI's Limitations

There are other limitations to the use of the PSI in mergers.

First, it is not unusual for a particular generator to be in a de facto price-setting position, particularly during market peak. The supply cost of the marginal generator to come on stream in a peak period will determine the peak market price. Such pricing 'power' stems, in the first instance, from the inelasticity of demand and the fact that short run supply is relatively fixed. These pricing problems would exist independent of concentration in the generation market – they are an inherent feature of the characteristics of demand at system peak.

Second, a generator which is 'significantly' pivotal (and this begs the question of what this means), and therefore has the ability to exercise market power, may not have the incentive to do so. This may be for contractual reasons that characterise generation markets. Most generators sell a substantial amount of their power forward. These forward contracts specify the delivery of a quantity of power at a given time at a given price. If a generator attempts to withhold output in order to drive up the price in the spot market, it may result in some of that generator's customers being short of power and forced to purchase more expensive power in a balancing market. In addition, such an outcome may result in either the generator or the customer paying imbalance penalties. This would clearly reduce the financial incentive of a generator to exercise market power.

Many generators also have supply-side contractual commitments. Gas fired generators usually buy fuel on long-term take-or-pay contracts. Such contracts lock generators into a fixed amount of fuel cost, irrespective of demand. Although a generator could hedge fuel cost risk, it would need to take account of the costs of this when assessing the net benefits of withholding supply.

The assumption that generators can withhold output to 'game the price' without incurring substantial penalties is also at odds with the way electricity markets work. In most electricity markets generators bid supply functions (a schedule of quantities and prices) and are dispatched in merit order (from least cost upwards) to meet aggregate system load. These quantities may, depending on cost and availability, be adjusted during the day in response to actual demand and supply conditions. It is usually the role of the transmission system operator (TSO) to ensure that generators are dispatched at least cost and that they run as scheduled. Blatant attempts by generators to withhold capacity when there are no unforeseen technical reasons to do so, are likely to be detected and punished.

Conclusions

In most capacity constrained markets a generator will be in a pivotal position at the very peak of the market. This is often a transitory situation and serves as a useful signal for investment in capacity. It can, however, become problematic if the situation becomes chronic. The difficulty for regulators is in distinguishing transient circumstances that create opportunities for price setting from a more permanent market power problem. For this reason, the PSI is a highly unreliable measure of evaluating market power in merger control.

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