

CRA Competition Memo



“Vertical arithmetic” The use of empirical evidence in vertical mergers

While the use of empirical techniques has become common practice in horizontal merger investigations, the presentation of quantitative evidence is less frequent in the area of vertical mergers (or non-horizontal mergers more generally). This may be changing, in particular as the European Commission is developing its non-horizontal merger guidelines. A useful empirical tool was recently used during the EU merger investigation of the potential acquisition of British Plaster Board (BPB) by Saint-Gobain (SG).¹ During the investigation a “vertical arithmetic” methodology was submitted to the Commission to assess post-merger incentives to foreclose downstream rivals by measuring the profitability (or lack thereof) of such a foreclosure strategy.

The notified transaction

BPB is a major producer of plasterboard used in construction projects. SG is a major producer of insulation products (also used in building applications) as well as a distributor of construction materials (including plasterboard). The transaction led to limited horizontal overlaps. Conglomerate effects (e.g. bundling of plasterboard and insulation) were also considered but set aside due to the absence of any credible anti-competitive story. Hence, the major focus of the investigation was on the vertical effects of the acquisition of BPB by SG.

Vertical concerns primarily arose in two countries: in France (where SG’s distribution arm and BPB both have an important presence) and the United Kingdom (where BPB is the leading supplier of plasterboard and SG’s distribution arm also has a presence). One of the vertical concerns was that post-merger, SG/BPB would have incentives to limit or stop the sale of BPB plasterboard to SG’s rivals at the distribution level so as to increase sales through SG’s distribution arm.

Vertical mergers and foreclosure concerns

It is well established in economics that non-horizontal mergers *a priori* cause less concerns than horizontal mergers from a competition perspective. Horizontal mergers bring together producers of *substitutes* and can eliminate rivalry that kept the (unilateral or coordinated) exercise of market power at bay. Vertical mergers, by contrast, bring firms with *complementary* activities under common control. Because they do not eliminate competition between rivals, it is inherently more difficult to describe ways in which vertical mergers can have anti-competitive effects. In addition, it is well understood how vertical mergers can bring about greater efficiency – both through synergies on the cost side,

and through incentives to lower prices and increase investment. The effects of vertical mergers on pricing and investment decisions derive from what economists refer to as “elimination of double marginalisation” and the “Cournot effect” when products are complements.²

This is *not* to say, of course, that vertical mergers should never be a cause of competition concern. Economists have identified various circumstances in which a firm with market power in one market may have an incentive to extend its market power into an adjacent market – either to realise additional profits that could not be extracted from the initial position of market power or to protect an existing position of market power from a threat of future competition (“defensive leveraging”). Much of this economic research and modelling has been in the context of bundling (see for example the GE-Honeywell or Microsoft cases), but the same insights apply to vertical mergers and the possibility of vertical foreclosure. Whether the exclusionary mechanism is bundling or some form of vertical foreclosure, modern economics teaches that there are circumstances in which a firm with market power at one level may have an incentive to extend its market power into an adjacent market.

The fact that a firm with market power at one level *may* have an incentive to extend market power through a strategy of vertical foreclosure does not mean that vertical foreclosure is a serious concern in every vertical merger. On the other hand, the possibility of vertical foreclosure cannot be ruled out as a matter of economic theory. Whether it is a serious issue in any particular investigation always depends on the facts of the case.

Vertical arithmetic

Foreclosure concerns may arise (a) *downstream* (e.g. refusal to supply an essential input to rival distributors); or (b) *upstream* (e.g. refusal to deal with upstream rivals). In the SG/BPB case, the Commission investigation considered downstream foreclosure effects in France and the United Kingdom.³

From a competition perspective, the assessment of a foreclosure strategy (upstream or downstream) requires

1 Charles River Associates, in collaboration with Professor Neven, acted as economic advisors to Saint-Gobain during the investigation. The transaction was cleared by the European Commission on 9 November 2005 and BPB’s board accepted Saint-Gobain’s cash offer on 17 November 2005.

2 The efficiency-enhancing effects of vertical mergers are widely discussed. For example, see a September 2004 study undertaken for the European Commission’s Competition Directorate General to assist the preparation of its forthcoming non-horizontal merger guidelines (the Church report is available on the Commission website).

3 Upstream foreclosure was also considered in France where SG’s distribution arm is an important player at the distribution level. These concerns were dismissed mainly on grounds that Knauf and Lafarge are strong competitors to BPB with sufficient access to alternative distribution networks and therefore unlikely to be foreclosed.

answers to three questions: (1) would the merged firm have the *ability* to implement a foreclosure strategy (or would rivals be able to take counter-measures that would allow them to remain effective competitors); (2) would the merged firm have an *incentive* to foreclose (or would the costs to the merged firm of the foreclosure strategy outweigh the benefits); and, (3) even if the merged firm would have the ability and incentive to foreclose, would consumers be harmed?⁴

Vertical arithmetic is a useful tool for shedding light on the profitability of a foreclosure strategy and hence for determining whether a vertical merger would provide *incentives* to foreclose downstream or upstream rivals. In its simplest form, the vertical arithmetic methodology involves the calculation of the main costs and benefits associated with a foreclosure strategy.

The profitability of downstream foreclosure⁵

During the Commission investigation of the SG/BPB transaction, Charles River Associates analysed the incentives that SG/BPB would have, post-merger, to eliminate or restrict the ability of competing distributors to obtain BPB products.

The cost of such a strategy would be the lost upstream margin on wholesale sales of BPB products that would otherwise have been made to rival distributors. The benefits of the strategy to SG/BPB would arise from the weakened downstream competition from rivals, no longer able to offer BPB products. The idea is that, following the disappearance of the BPB plasterboard in rival outlets, customers with a strong preference for the BPB brand would visit SG's distribution outlets in order to buy BPB plasterboard. On those additional sales, *both* the upstream margin (at the production level) and the downstream margin (at the distribution level) would be earned by SG/BPB.

Hence, the incentive to refuse to sell BPB plasterboard to competitors of SG's distribution arm depends in the first instance on the relative value of three parameters: (1) BPB's production margin on plasterboard; (2) SG's downstream margin on sales of BPB plasterboard to final customers; and (3) the *diversion ratio* from distribution rivals to SG distribution outlets.⁶

Taking account of the fact that loyalty varies across types of plasterboard customers, and using estimates of upstream and downstream margins, we concluded that the market conditions in both France and the UK were such that SG/BPB would have no incentives to limit sales of BPB products through rival networks. The costs of the strategy (the upstream margins foregone) outweighed the potential benefits (the upstream and downstream margins on the

additional sales through SG's distribution network resulting from the hypothetical foreclosure strategy).

Given the uncertainty on the precise value of some variables (e.g. BPB's production margin⁷ and customer loyalty), we also undertook an alternative calculation. The "critical levels" of these key variables were estimated, i.e. the level above which a foreclosure strategy would become profitable. The estimated critical values allowed us to conclude that the foreclosure strategy was unlikely to be profitable for any reasonable range of margins and loyalty levels.

Limitations and possible extensions

The simple cost/benefit analysis presented above has certain limitations. First, it assumes that margins and prices remain constant post-merger and focuses instead on volume effects. As indicated, the results of this analysis can be very helpful in assessing whether foreclosure is even remotely plausible. However, an analysis that assumes constant prices by definition cannot address the ultimate question of the likely effects of a vertical merger on the prices paid by consumers. Second (and a related point), the analysis does not incorporate efficiency effects usually expected to arise from a vertical merger, generating (if anything) lower customer prices.

Price effects can be incorporated but require more complex models equivalent to merger simulation models. Such a model was recently built by Charles River Associates in the context of the investigation of the Sasol/Engen merger in the oil industry in South Africa. The Charles River Associates vertical foreclosure model has been a key element of the investigation.⁸ Even the economic advisors of intervenors have used the Charles River Associates model, substituting alternative values for input assumptions to clarify their own arguments.

Conclusion

In contrast to horizontal merger cases, the use of empirical analysis in the context of vertical mergers has so far been limited and unsystematic. Against this background, vertical arithmetic is a useful tool for the review of vertical mergers.⁹ In its simplest form, the data requirements of the vertical arithmetic are minimal, and yet the results of these simple calculations may be sufficiently robust that the competition authorities can rely on the calculations to determine at a fairly early stage of the investigation whether or not foreclosure is a serious issue. Depending on the circumstances of the case, a more complex version of the methodology may be warranted. However, even in its simple form, the vertical arithmetic methodology at least provides a systematic approach, which transcends mere assertion and brings empirical evidence to bear on vertical merger issues.

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4 A complete analysis of vertical foreclosure should also consider how the vertical merger changes the apparent profitability of foreclosure. If the analysis indicates that vertical foreclosure would have been a profitable strategy before the merger (and yet foreclosure did not occur), it is a sign that something is missing from the analysis.

5 This memo discusses downstream foreclosure but a similar methodology applies to upstream foreclosure strategies.

6 There are various ways to estimate the diversion ratio: from econometric estimates of demand elasticity to customer surveys or the parties' perception of their customers' loyalty. In our calculations, we used the perceived loyalty rate of customers to the BPB brand to estimate the share of customers that would switch to the SG distribution network if the BPB brand were unavailable in rival distribution networks.

7 The acquisition was initially hostile and SG did not have access to BPB data.

8 The hearing in this matter before the South African Competition Tribunal was recently completed and the parties are awaiting the Tribunal's decision. Charles River Associates has provided economic advice to Sasol and Engen, the merging parties.

9 Charles River Associates has used this methodology in US investigations in a number of vertical transactions over the past decade, including SBC-Ameritech, Primestar, AOL-Time Warner, Premdor-Masonite and News Corp/DIRECTV.