

The mode of competition: where to start and when to stop in merger analysis

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“Begin at the beginning,” the King said gravely, “and go on till you come to the end: then stop.” The suggestion (or order) given by the King to the White Rabbit is ludicrously obvious. Yet, it is often neglected. The best way to begin an economic analysis is to ask a relevant question. This is also recalled in the Best Practices Guidelines on the submission of economic evidence and data collection, issued by the European Commission for the review of competition cases in general, including mergers.¹

Competition brings about many positive outcomes to customers, ranging from the level of prices, high quality, variety, and innovation. A merger may lessen firms’ incentives to compete on one of these dimensions and harm consumers. So, the relevant question is: will the post-merger new entity have the ability and the incentive to exert a higher market power?

Several empirical analyses may help answer this question and one may wonder which one(s) are the most reliable. This note argues that the best way to make this call is to understand first how firms compete in the

market, something economists refer to as the “mode of competition”. In the context of merger control, the identification of the mode of competition can improve both the identification of the relevant antitrust economic question(s) *and* of the most adequate economic analyses to answer the question(s). An example in the second part of this note will show in practice how this straightforward suggestion may improve the efficiency and the effectiveness of an antitrust investigation.

The modes of competition

Economic analyses (whether qualitative, descriptive, or more quantitative) draw, either explicitly or implicitly, on some economic model, i.e., on a stylisation of firm’s behaviour. Therefore, only some of them are meaningful, given the mode of competition in the market. Moreover, the mode of competition may be important in identifying the relevant variables to consider and the data to employ.

Two models of firm behaviour stand out for the analysis of unilateral competitive effects of mergers. Firms can compete either on

¹ The Guidelines add that the economic question must be “properly motivated taking into account the nature of the competition or merger case, the institutional

features of the markets under consideration and the relevant economic theory” (§17(b)). The clarification provides a framework for testing relevance.

quantities (Cournot-oligopoly models) or on price (Bertrand-oligopoly models). The first are best suited for homogeneous product industries; the second are best suited for differentiated product industries.

In markets where products are *homogeneous*, customers have a wide range of choices and firms compete on quantity. Firms make optimal decisions about their own output and sell their goods at the market clearing price (the one that clears output at the industry level). When customers are indifferent – or may be not able to distinguish – between the products of any two firms from each other, more efficient firms will be able to market a larger amount of output at the market clearing price, therefore cost efficiency is the main driver of competition and will result in greater market shares.² In Cournot models there is a straightforward relationship between a firm's market share and its profit margin. This relationship provides the theoretical foundation of the Herfindahl-Hirschman Index (HHI) a measure that is widely used in merger control.

When products are *differentiated*, product characteristics varies across products and firms. In this case firms compete on prices, as well as on other product characteristics. In such a market, firms choose (or are endowed with) quality attributes of their products and are able to set their own prices accordingly, as long as products are distinct from the point of view of customers. Under these conditions, there is no straightforward and generally valid mapping between market shares and market power. Some products may be more similar than others, and consumers be more willing to substitute one for another. Market power then depends on the patterns of substitution followed by demand over different products that are available in the market, i.e., on the *relative proximity* of products in the characteristics that customers value. Under such conditions, market shares cannot generally predict market power. Even a small

² The magnitude and differences of market shares will reveal firms' relative cost efficiency.

market share may be associated with a significant market power if there are no sources of competitive pressure, such as close enough competitors to the specific products.³

The relevant elements in a merger review

The Guidelines on horizontal mergers approved in 2004 list the elements that the European Commission would normally consider in its competition assessment. These elements can be grouped in two main categories:

- those that help investigating the magnitude of the merger parties' own incentives to lessen competition (e.g., level of market shares; merger parties' closeness of rivalry and pre-merger profit margins); and
- those that shed light on market forces that could offset those incentives (e.g., relative proximity to non-parties products; ability of competitors to expand output, to access essential inputs or reposition their products; buyer power; entry).

The mode of market competition determines the dimensions on which firms compete and it can orient merger analysis as a valuable element to understand the likely effects of a merger: it reveals the channels through which a merger modifies the merger parties' incentives; it also helps identifying possible countervailing factors of a merger anti-competitive effects.

The relevant elements of the analysis that are most influenced by the mode of competition

In any mode of competition, the post-merger entity will find it profitable an increase in price as long as *part* of the sales that it would lose absent the merger stays with the new firm; the larger this part the stronger the incentive to raise the price.

In a *homogeneous* market a price increase follows an output reduction at the industry

³ A firm that specialises in a niche product, may have a small market share while making high profits if there are no close products.

level. The merging parties' incentive to reduce output increases in their market shares. However, outside competitors can potentially seize a large part of the demand gap, as long as they can expand output profitably. Hence, this is the relevant source of the competitive constraint and the economic analysis has to check whether it will remain effective after the merger.

When products are *differentiated*, instead, customers' range of choice is more limited as it is driven by product characteristics. Here, the non-merging parties' capacity to expand their own products' output is irrelevant if they cannot supply close enough substitutes. The mode of competition explains why the feature that one has to investigate is the *closeness* of rivalry. To clarify: we say that firm B is the closest rival of firm A when, should firm A increase its price, *most* of firm A's lost sales would go to firm B. This happens when customers of firm A are ready to buy products of firm B as they are considered good substitutes for the former, while the other products in the market are perceived as less so. When the merger involves firms that are the closest rivals to each other, it might remove the most important source of competitive pressure. The economic analysis has to check whether the competitive pressure from other suppliers of heterogeneous products will be effective after the merger.

The characterisation of the market at hand based on the mode of competition has a direct impact on the adequacy or interpretation of different types of economic analyses in the context of a merger review.

In a *homogeneous* market, the most adequate economic analyses focus on market shares and on the excess capacity of the competing firms that are not part of the merger. The first is an indicator of the merging parties' incentives to reduce output, the second is an indicator of offsetting factors in the relevant market. In fact, a strategy to increase the market price will succeed if competitors cannot profitably expand their current supply. This would be the case if they are already exploiting their capacity in full and capacity

cannot be furthered, or if expanding output or capacity would increase competitors' production costs.

The analysis of the industry capacity is much less meaningful in a *differentiated* market, as competitors may not be able to contend merging parties' sales through an expansion of their output *because products have different characteristics* that matters for consumers. Therefore, if the merging parties are close rivals (first relevant economic question), a second relevant economic question is whether non-merging parties offer products that are close substitutes too or could reposition their set of products. The feasibility and cost conditions of this strategy should both be analysed. The second part of the second question (i.e., about non-parties' product repositioning) will require to investigate both the ability and the incentives of the non-parties to do so.

The characterisation of a market based on the mode of competition also affects the analysis of other countervailing factors, such as entry or buyer power. In *homogeneous* markets products are more easily replicable. When products are *differentiated*, in addition to entry costs, potential entrants will have to consider their ability (or likelihood) to match the (quality/positioning of) products of the merging entity. Therefore, in differentiated markets the analysis of entry may be more complex and less reliable.

Buyer power is likely weaker in differentiated product industries. Buyer power may be less effective to restrain strategies to increase prices if the merger effectively involves the closest alternatives of supply and only leaves less valued outside options. Some of the channels through which a large buyer can threaten merging parties (such as upward integration or the promotion of growth of smaller competitors) would be costlier and more uncertain to implement. The strength of buyers, *ceteris paribus*, will be lower the higher the degree of closeness between merging firms and relative to other firms, and the higher firm's specialisation.

An example: RSI analysis

As an example of how the mode of competition is a primary feature in shaping merger analysis, this note discusses a case Lear has recently been engaged in by the Competition and Consumer Commission of Singapore (CCCS), for the review of the proposed merger between Korea Shipbuilding & Offshore Engineering Co., Ltd. (KSOE) and Daewoo Shipbuilding & Marine Engineering Co., Ltd. (DSME).

The CCCS had concerns that the merging parties would raise prices in the segments of the shipbuilding industry where their businesses largely overlap. The merging parties had submitted to CCCS an analysis of the excess capacity of the non-parties operating in the same segments, arguing that the results showed – and were sufficient to show – that CCCS’s concerns were ungrounded. The CCCS, among other things, asked Lear to revise such analysis.

KSOE’s analysis of the excess supply of outside competitors was based on the Residual Supply Index (RSI). The RSI indicates whether a firm’s capacity is needed (pivotal) to meet industry demand, based on the following formula, $RSI^i = \frac{(C^N - C^i)}{D^N}$, where C^N is total industry capacity, as it is the sum of capacity for each of all N firms operating in the industry; the difference $(C^N - C^i)$ is the industry residual capacity when excluding firm i ’s capacity; and D^N is total industry demand.⁴

By defining firm i to be the merged entity, a $RSI^i > 1$ would indicate that current industry residual capacity is larger than industry demand; while a $RSI^i < 1$ would indicate that current industry residual capacity is smaller than industry demand.⁵ However, the RSI can

merely compare current supply capacity and (current or expected) demand in *volumes*, *not in quality* or other product characteristics. It is evident that such a *volume-based* comparison is appropriate for homogeneous goods, as discussed earlier.

The RSI has been conceived as a specialised indicator of the degree of market power in wholesale electricity markets (Bataille et al. 2019). Electricity is a homogeneous good from customers perspective, while electricity generation marginal costs differ widely across generators; generators are ordered in terms of generation costs, and may be pivotal, especially during demand peak hours, having the ability of increasing prices by just withholding capacity. In antitrust enforcement the RSI has been largely employed in market monitoring and in cases of abuse of market power in the energy sector, while in merger analysis, as far as we know, the RSI has been used only in markets for cement, which is also a homogeneous good.⁶

The theoretical foundation of the RSI was provided by Sheffrin (2002), who first introduced the RSI, as related to oligopoly models for electricity spot markets, such as Green and Newbery (1992) where electricity generators compete in supply schedules (i.e. they submit prices for each level of output they are willing to supply) and receive the market-clearing price, which is determined by optimising the schedules submitted by all generators to meet demand at the lowest generation price.⁷

As discussed before, to come up with this analysis as meaningful in the merger review under consideration, one has first to accept the (explicit or implicit) argument that products are homogeneous, or that product

⁴ Capacity and demand must clearly refer to the same set of firms. And are both expressed in the same relevant units (in the case at hand proper units of measure could refer to the number of ships or to the tonnage of load capacity).

⁵ The value of one is the theoretical threshold, but in empirical applications it is common to assume a higher threshold.

⁶ European Commission Case M.7054 – Cemex / Holcim Assets. Cement is a homogeneous, low-cost commodity,

with highly price-inelastic demand and lack of differentiation in product and technology. These traits have been presented as typical of cement local markets by Joe Harrington at the OECD’s Global Forum on Competition in 2015 (available at https://www.oecd.org/competition/globalforum/Harrington_OECD_10%2015.pdf; accessed on 16 September 2020).

⁷ See Green and Newbery (1992), p.932-933.

differentiation between the merging firms and other firms included in the analysis does not matter in driving demand. As it is, the RSI totally disregards the cross-elasticity of substitution of demand for the same type of ships from different shipbuilders; in particular it assumes that customers are indifferent between a ship of a given type built either by KSOE or by DSME or by any other provider.

There was evidence already collected by the CCCS, though, that this was not the case and that the shipbuilding market is a quite differentiated market, where shipbuilders place bids for contracts and where customers evaluate not only the price but also several other dimensions or requirements over which the quality of shipbuilders varies (flexibility, customisation, timing, technology and know-how); that both KSOE and DSME are perceived by customers as providing ships of better quality over many of these dimensions (especially flexibility, customisation and technology); that other shipbuilders are not considered able to provide the same level of quality as the merging parties; and that quality varies also across the non-parties.

The CCCS had given Lear several tasks regarding the RSI, to test its robustness within the specific empirical implementation proposed by the merging parties and with respect to the many assumptions required to develop the index.⁸ Lear has accomplished this

⁸ To focus on the key issues, this note purposely overlooks many technical aspects that challenge the empirical implementation even when one agrees that the theoretical foundation of the methodology is suitable for the market at hand, such as the fact that capacity cannot be directly measured and it has to be proxied by historical output information; the presence of different market segments, some of which are of interest in the analysis while others are not; the fact that the weight of each segment in a producer's observed output differs, that many producers are not active in all segments or that output in a given segment may be discontinued. Therefore, the degree of supply substitutability across segments at the producer level and across different plants of a given producer is also an issue (one needs to make lots of hypothesis about know-how and capacity in order to infer them from historical output: e.g. how readily or not they are common or transferable across segments and plants of the same producer; if there is a hierarchy in the know-how and in the capacity allocation across segments; how know-how

task and revised the empirical implementation of the RSI proposed by the merging parties, testing the main assumptions and computation methodologies, that challenged KSOE's results especially in two key segments of the market.⁹ However, we believe that the most important part of Lear's contribution has been to provide the CCCS with evidence that the RSI was not adequate to shed light on the possible anti-competitive effects of the merger, since the RSI was derived from a model of firms' competition different from the mode of competition prevailing in the shipbuilding industry, and therefore it would answer the *wrong* economic question in this case.

Lear highlighted that the correct economic question in the market at hand, given the mode of competition, was not whether the merging parties are/are not able to raise the market price by withholding their output as the non-parties capacity does not/do suffice to meet market demand. The right economic questions were whether the merging parties are the closest competitors to each other and whether there are other firms in the market whose products are close enough to those of the merging parties so that after the merger downward price pressure would not be completely removed.

In line with Lear's analyses, the CCCS final and clearance decision¹⁰ has been mainly based on

obsolescence occurs). One has also to decide how to incorporate demand estimates for the future, and to account for changes in the spare capacity of competitors along the evolution of demand in the market segments of interest and in other segments in which a shipbuilder may operate, when such other segments are not included in the market under consideration in the merger review.

⁹ We also explained to the CCCS another weakness of the RSI, that is, that even an RSI above unity may still imply that after the merger prices might rise if non-parties are less efficient, or production costs are increasing in output.

¹⁰ <https://www.ccs.gov.sg/-/media/custom/ccs/files/public-register-and-consultation/public-consultation-items/ksoe-daewoo-shipbuilding-merger/ksoe-dsme-phase-2-grounds-of-decision-public-version.pdf?la=en&hash=EF1DEBD95F775D22C10F70E183BC1C5E8AF60B>

the results of the analyses aimed at investigating the closeness of rivalry of the merging parties and the relative market positioning of the non-parties. Any consideration of excess capacity has been restricted only to close rivals of the merging firms.

Let's keep in mind the King's suggestion (or order). Understanding the mode of competition is useful not only to know where to begin, but also when it is time to stop.

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If you would like to discuss those issues further, or if you would like more information about what our forensic economists can do for you, please contact us.

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