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Agenda

Advancing economics in business

Soaps, groceries and app stores: extending merger price-rise analysis

Simple tests based on firms producing a single product have become increasingly popular among competition authorities looking to assess the effect of mergers on prices. In reality, however, firms often produce several related products. Does this introduce any potential biases to these tests? If so, what can be done to mitigate them?

Over the last five years, competition authorities have increasingly used simple price-rise tests when assessing the impact of mergers between competitors. For example, the UK Office of Fair Trading (OFT) and Competition Commission have applied the gross upward pricing pressure index (GUPPI) and the illustrative price rise (IPR) test in a range of sectors, including grocery retailing, fast-moving consumer goods (FMCG), and online retailing.[1]

These simple tests have a number of advantages. They do not rely on a particular market definition; rather, the focus is directly on the effects of the merger, and the market definition stage can be bypassed (after all, market definition is only an intermediate stage of the merger analysis).[2] They are relatively less data-intensive, so they can usually be computed in the early stages of an investigation. In general, they are also more suited to industries with a high level of differentiation than the standard market share and concentration measures, since not all firms are equally close competitors.[3]

This article briefly summarises the underpinnings and the application of the standard IPR test, and then presents examples of market situations where individual firms sell multiple products. While in these cases the standard IPR test may be applied, it is important to be aware of the potential biases that could be introduced to the assessment. The conceptual framework necessary to mitigate these biases is set out and explained.[4]

The standard illustrative price rise

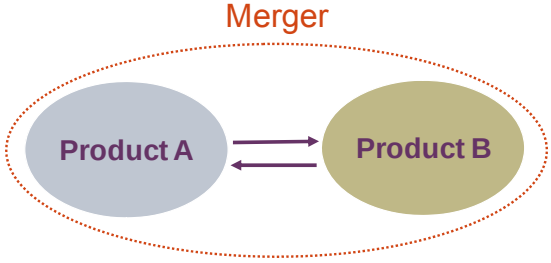
The IPR test as applied in recent cases is, in essence, based on a model of two single-product firms that produce differentiated goods. It contains a number of important assumptions:

- the firms compete only on price;
- the reactions of other competitors after the merger are not considered;
- the demand curve is either linear or isoelastic.[5]

The idea behind the IPR is that, before the merger, the two competing parties exert a 'pricing externality' on each other—specifically, when one firm increases its price, it loses some customers to the other firm by increasing the demand faced by the latter. This increase in demand is a positive externality that the two firms do not take into account when they are under separate ownership. After the merger this externality is internalised, which increases the incentive of the merged entity to raise prices.[6] Figure 1 below illustrates the relationship between the merging parties, assuming that they are symmetric (ie, they have the same margin and diversion ratios).

The increased incentive arises from the fact that, following a price rise, the merged firm will recapture some of the lost sales from one product through increased sales of the other product. This effect is captured by the IPR, which translates it into a predicted price rise.[7] The standard IPR test requires information

Figure 1 The symmetric merger setting



Note: The arrows represent diversion ratios between the products.
Source: Oxera.

only on margins and diversion ratios. The IPR with linear demand is shown below:

$$\frac{\text{margin x diversion ratio}}{2 \text{ x } (1 - \text{diversion ratio})}$$

Note that the IPR above assumes that each merging party supplies one product, or treats all products by each party as one product.[8] In practice, however, individual firms often produce multiple products:

- the products can be each other's substitutes (eg, liquid soaps and bar soaps in the *Unilever/Alberto Culver* case[9]);
- the products may be complements (eg, fuel and groceries in the case of petrol stations);
- the products can be related through two-sided markets (eg, articles and advertisements in newspapers).

In each case, there are externalities between the products sold by a single firm. For example, when a firm is active in two distinct but related product segments that are substitutes for each other, the firm will take into account the fact that a price increase in one segment will increase sales in the other segment. This interaction between the two product segments affects the prices each firm sets pre-merger, as well as the prices set by the merged firm, and thereby the potential effect of the merger on prices.

To account for such interactions, it is therefore necessary to extend the IPR test. While the methodology available to extend the standard test is, in principle, the same for all the above cases, the mechanism is somewhat different in each case.

Multi-product IPR in the case of substitute products

Consider a case where each merging firm sells two substitute products pre-merger. This encompasses substitutability in terms of products and geographies. For example, some consumers may consider liquid soap and bar soap as substitute products—a point that arose in the *Unilever/Alberto Culver* merger in 2011.[10] Similarly, a supermarket chain may have two stores in the same town (alongside other, competing stores) and consumers may choose between them based on, say, the quality of service they offer.

Figure 2 illustrates the case of domestic hand-washing products, indicating the market segments that were considered in *Unilever/Alberto Culver*. As shown, each of the merging parties supplies two products: liquid soap and bar soap.

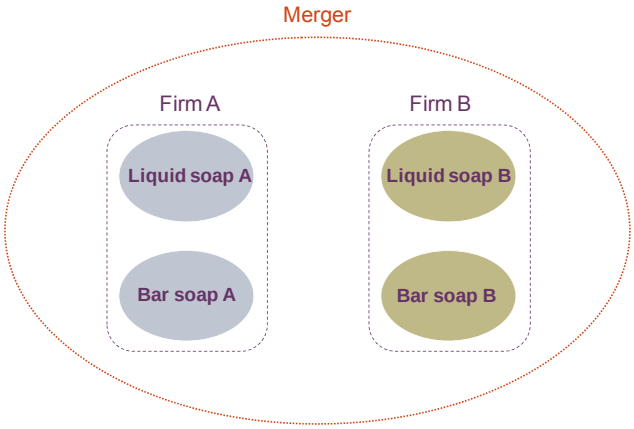
In the case of hand-washing products, the application of the standard IPR test would involve calculating IPRs separately for the liquid soap segment and the bar soap segment. The competitive interactions that are taken into account in this approach are shown in Figure 3 below.

This simple approach accounts for the competitive interactions between the merging parties within a segment, but not for the potential competitive interactions across the segments. For example, some consumers, when their preferred liquid soap A is not available in store, may choose firm B's bar soap B as the second-best alternative. Therefore, in this example liquid soap A faces competition not only from liquid soap B, but also from bar soap B. Bar soap A—which is also manufactured by firm A—is also an alternative to liquid soap A (not to mention the set of other competing brands of liquid soap and bar soap).[11]

Figure 4 overleaf illustrates these potential competitive interactions—in the form of potential diversions of customers between product pairs—arising from the relationships between the product segments.

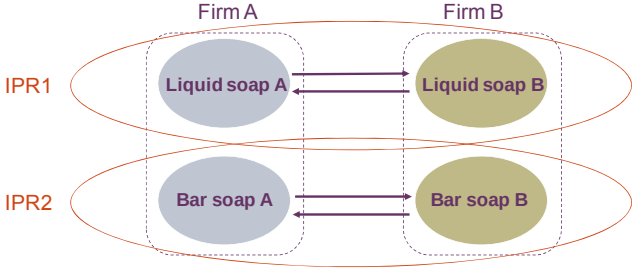
While considering all relevant interactions within and between the product segments results in a cobweb of diversion ratios, ignoring these interactions could have a significant impact on the predicted merger price rise.

Figure 2 The relevant merger situation with multi-product firms



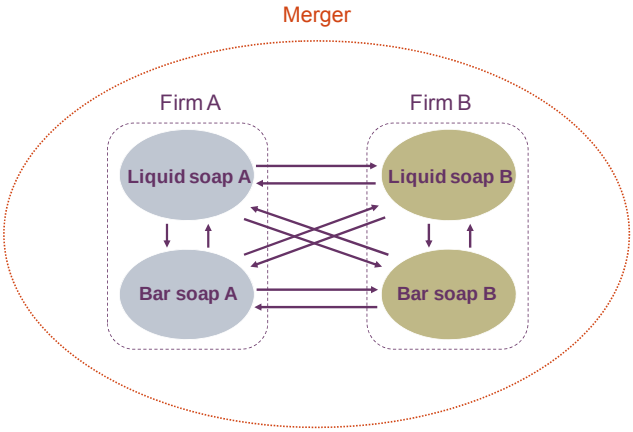
Source: Oxera.

Figure 3 Applying the standard IPR test for multi-product firms



Source: Oxera.

Figure 4 All relevant interactions between the merging parties and their products



Note: Third parties may exert different levels of competition on the various products of the merging parties; therefore, the products of the merging parties may have very different diversion ratios between each other.
Source: Oxera.

To understand these interactions, take liquid soap A as the focal product, and assume that the pricing of the three other products of the merging parties is not actively adjusted to take into account the merger, but only in reaction to the initial price change of the focal product. In this case, the mechanism is as follows.

Both before and after the merger, the price of the focal product, liquid soap A, is set by taking into account the diversion between liquid soap A and bar soap A. Firm A, the owner of both products, essentially sets the prices of liquid soap A and bar soap A in order to optimise the combined profit of the two products. This results in a different pre-merger benchmark price compared with the standard IPR test. In the post-merger situation there are three potential effects.

- First, there is a direct effect of loss of competition with liquid soap B and with bar soap B (after liquid soap A increases its price, some of the lost sales are recaptured by the products of firm B after the merger).

- Second, there is a direct 'feedback effect' from liquid soap B and bar soap B. Recapturing some sales results in increased demand for these products, which prompts firm B to increase their prices. This also results in some lost sales, a fraction of which are captured by firm A. (The diversions from liquid soap B and bar soap B to bar soap A matter here, as well as those from liquid soap B and bar soap B to liquid soap A.)

- Third, there is an 'indirect effect'—ie, the additional incentive to increase the price of liquid soap A due to the fact that bar soap A would also increase prices following the loss of competition from liquid soap B and bar soap B.[12] This depends on the level of substitutability between liquid soap A and bar soap A.

If these effects are taken into account, the predicted merger effect may be significantly different from that implied by the standard formula. However, the direction and extent of the bias would depend on the specifics of the case—namely, the relative strength of competition between merging parties within a product segment (eg, liquid soaps), as well as across the two product segments.

This extended IPR test involves greater complexity, arising from the requirement to measure the diversion ratios between all different product pairs, and the advantage of this higher precision needs to be weighed against the extra complexity it entails.

The case of two-sided markets and complementary products

The standard IPR test may also not be appropriate when dealing with two-sided markets or multi-product firms where products within each firm are complements to each other. The logic behind two-sided markets and complementary products is very similar.[13]

In two-sided markets, the provider of a 'platform' serves two distinct groups of customers (for example, a newspaper publisher serves both advertisers and readers). In general, each group of customers values the platform more, the more customers there are on the other side of the platform. This is a positive indirect network externality. In the example of an online app store for smartphones and tablet computers, the more applications there are available on a given platform, the more its consumers value the platform. Equally, app developers value the platform more, the larger the platform's consumer base.

If one app store raised the prices it charged to app developers for access to its platform, it would lose some of them to competing platforms. As a consequence, some consumers would value the platform less and would stop using it. A proportion of these consumers would switch to competing app stores. The motivation for the consumers to switch is that the value of these rival platforms to consumers would now be higher because more app developers offer their software through them. So if an app store raised prices to one group of customers, it would lose profits from both groups. In these circumstances the standard single-product IPR test, calculated separately for the two sides of the market, could lead to biased conclusions, and underestimate the effect of the merger.[14]

Concluding remarks

The extension of the IPR test to multi-product situations constitutes a useful addition to the economist's merger analysis toolbox. However, the other limitations that apply to the standard IPR test also apply to the extended version, such as the fact that these tests do not take into account the response of competitors to a price rise implemented by the merged entity, or the repositioning of brands in the market.

How feasible is it to obtain the extra parameters required? Although they may entail extra costs due to the more complex nature of the analysis, there are approaches available to obtain the necessary parameters. For example, in the case of consumer goods, scanner data often exists which can be used to estimate relevant diversion ratios indirectly. In addition, consumer surveys can be used to obtain the relevant diversion ratios directly.

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[1] See, for example, Office of Fair Trading (2008), 'Anticipated Acquisition by Co-operative Group Limited of Somerfield Limited', ME/3777/08, November 17th; Office of Fair Trading (2011), 'Anticipated Acquisition by Unilever of Alberto Culver Company', ME/4805/10, April 5th; or Office of Fair Trading (2011), 'Anticipated Acquisition by Amazon.com Inc of the Book Depository International Limited, ME/5085/11, December 14th. A number of other variants of the tests have been proposed in the economic literature, such as the upward pricing pressure index (UPP) and compensating marginal cost reduction (CMCR). The underlying logic is similar.

[2] In markets where product differentiation is not significant, market definition still provides a useful framework for the merger analysis.

[3] The various forms of these tests have been discussed extensively in the economics literature. See, for example, a paper by the inventors of the UPP test: Farrell, J. and Shapiro, C. (2010), 'Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition', *The B.E. Journal of Theoretical Economics*, **10**:1, March.

[4] Similar issues may arise in the context of market definition where firms produce multiple products. For a discussion, see ten Kate, A. and Niels, G. (2012), 'The Hypothetical Monopolist in a World of Multi-Product Firms: should Outside Companions be Included in his Basket?', *Journal of Competition Law and Economics*, **8**:4, pp. 701–15.

[5] Isoelastic means that the elasticity of demand is the same at every point on the demand curve.

[6] As an alternative to increasing prices, firms may choose to increase profits after the merger by worsening other parameters of their offering, such as the quality of the products. Although the two firms compete only on price in the underlying model, the IPR implicitly takes this into account. For simplicity, the term 'price' is used throughout.

[7] The IPR measures the likely price rise due to the merger in percentage terms. A more complex formula is available to incorporate features such as asymmetric diversion ratios and margins.

[8] For example, grocery stores selling a basket of goods are assumed to sell one 'composite product' and grocery store mergers are analysed at this level rather than at the individual product level.

[9] Office of Fair Trading (2011), 'Anticipated Acquisition by Unilever of Alberto Culver Company', ME/4805/10, April 5th.

[10] Office of Fair Trading (2011), 'Anticipated Acquisition by Unilever of Alberto Culver Company', ME/4805/10, April 5th. In the end the OFT took a 'cautious approach' and assessed the competitive effects of the merger in relation to bar soaps and liquid soap separately (para 23).

[11] As some consumers view the liquid soap and bar soap products of the same firm as alternatives, the firm has to take into account in its pricing the possibility that if it increased its price on liquid soap, some of its consumers might switch to its bar soap product.

[12] As the prices of liquid soap B and bar soap B were raised following increase in demand for these products, some purchasers of these products would be lost to bar soap A.

[13] This has been recognised in the literature. For example, Affeldt et al. (2012) examine the GUPPI in the context of two-sided markets: Affeldt, P., Filistrucchi, L. and Klein, T.J. (2012), 'Upward Pricing Pressure in Two-Sided Markets', TILEC Discussion Paper DP 2012–029, July 23rd.

[14] In some cases in two-sided markets, firms may sell their products on one side of the market at very low or even negative margins in order to build their customer base and to induce the other side to participate in the market. In the case of negative margins in one side of the market, the standard IPR test would overestimate the effect of the merger on the other side of the market. The standard IPR formulae can be easily extended to incorporate all interactions. Technically, this results in a set of equations that are the same for all the cases discussed. In matrix notation the formulae are:

$$[\Delta P] = [D]^{-1} \times [d] \times [M]$$

Here, $[\Delta P]$ is a matrix that contains the price changes of all products of the merging parties to be estimated; $[d]$ is a matrix that contains all diversion ratios among products; $[D]^{-1}$ is a function of all diversion ratios; and $[M]$ is a matrix that contains the gross margins of all products.

If you have any questions regarding the issues raised in this article, please contact the editor, Dr Leonardo Mautino: tel +44 (0) 1865 253 000 or email l_mautino@oxera.com

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