

## COST PASS-THROUGH: WHAT CONSTITUTES A ‘FAIR SHARE’?

The degree to which cost savings or increases are passed on to consumers is relevant to various aspects of competition law, including merger control, Article 81(3), and damages claims. This month’s Competing Ideas presents the basic economics of cost pass-through and highlights some common misperceptions in this area

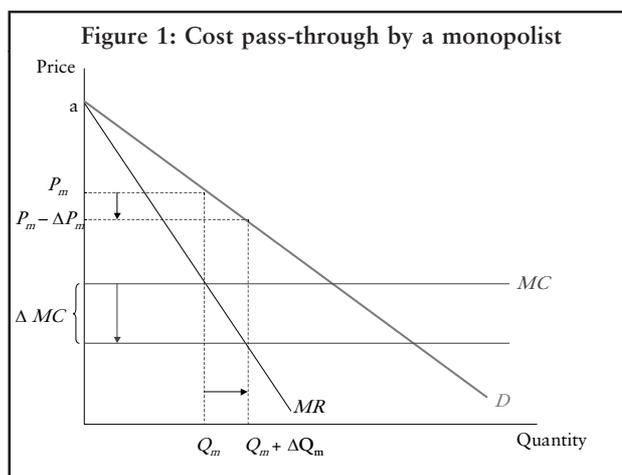
In many types of competition case, the question is raised as to the degree to which cost savings or increases are passed on to consumers. In merger cases, efficiency gains arising from a proposed transaction can be taken into account, provided that these efficiencies are of direct benefit to consumers.<sup>1</sup> Under Article 81(3) of the EC Treaty, one of the exemption conditions for restrictive agreements is whether consumers are granted a ‘fair share of the resulting benefit’. Likewise, when assessing the harm to consumers of certain anti-competitive behaviour, or when calculating damages, it might be appropriate to consider whether these consumers have suffered directly from higher prices, or whether in the case of intermediate consumers, they, in turn, were able to pass these higher prices on to their customers.

This article, first, explores what basic economic theory has to say about cost pass-through; it then highlights the sometimes counterintuitive implications for the specific areas of competition law referred to above.

### The monopoly base case

The standard textbook monopoly model provides some insight into the mechanisms that determine cost pass-through. Such a model is depicted in Figure 1. The monopolist faces a linear, downward-sloping demand curve,  $D$ , and it maximises profits by setting a price ( $P_m$ ) where marginal cost ( $MC$ ) equals marginal revenue ( $MR$ ).<sup>2</sup>

If the monopolist realises a cost saving whereby the  $MC$  curve moves down (by  $\Delta MC$ ), how much of this cost saving is passed on to consumers via a reduction in price  $P_m$  (by  $\Delta P_m$ )? The answer is exactly *one-half*. The reason is that the marginal revenue curve is always twice as steep as the demand curve.<sup>3</sup> In Figure 1, if the cost decrease were to lead to the new monopoly output  $Q_m + \Delta Q_m$ , the corresponding price could be calculated by moving up from the new output to the point of intersection with the demand curve, which is at



price  $P_m - \Delta P_m$ . Any change in marginal cost will lead to a change in monopoly price by half as much. This result holds true for any cost increase as well as a cost decrease.

If the demand curve is convex instead of linear—ie, it starts steep to the left and becomes flatter moving to the right—the pass-through ratio is greater than 0.5. If the demand curve is concave—ie, it starts flat to the left and becomes steeper moving to the right—the pass-through ratio is less than 0.5. However, such concave demand curves are less likely to occur.

The counterintuitive aspect of this result is that even monopolists will pass half of their cost savings on to consumers in the form of reduced prices (not out of good will but in order to maximise profits). Conversely, if they face a cost increase, they will only pass on one-half of that increase to consumers. This contradicts the misperception that monopolists never pass on any cost savings to consumers, or that they always load cost increases on to their consumers.

<sup>1</sup> See, for example, the European Commission’s ‘Draft Commission Notice on the Appraisal of Horizontal Mergers’ (Section VI), issued on December 11th 2002.

<sup>2</sup> In Figure 1, marginal cost does not change with output. Changing this assumption would not affect the conclusions drawn.

<sup>3</sup> Technically, if the demand curve is defined as  $P = a - bQ$ , total revenue is  $PQ = aQ - bQ^2$ , and marginal revenue becomes  $P = a - 2bQ$ . Hence, the demand curve has slope  $b$  while the  $MR$  curve has slope  $2b$ .

Another surprising finding is that the pass-through ratio of 0.5 is independent of, first, the size of the cost saving ( $\Delta MC$ ), and, second, the slope of the demand curve—ie, it is not important whether this curve is very steep (suggesting inelastic demand), or rather flat (suggesting more elastic demand). This is of relevance to the European Commission's draft guidance on the application of Article 81(3), which was published in October 2003, as further discussed below.<sup>4</sup>

### Pass-through in oligopoly

In oligopoly—ie, where a limited number of firms compete in the market—the analysis of cost pass-through becomes more complicated, and providing a detailed description of this analysis is beyond the scope of this article. However, the results of this analysis are similar to those of the monopoly case; they can be summarised as follows.<sup>5</sup>

- First, if there are  $N$  number of oligopolists in the market, and one of them realises cost savings, the market price reduces by a fraction  $1/(N + 1)$  of that cost saving. This is the case regardless of whether the firm that makes the cost savings has a large or small market share.<sup>6</sup>
- Second, if a cost saving—whether realised by one, several, or all firms in the market—is expressed as an average cost saving across all firms, then the market price reduces by a fraction  $N/(N + 1)$  of that average cost saving.<sup>7</sup>

This last result can be compared with that of a monopoly. Indeed, in a monopoly,  $N$  equals 1; consequently, the pass-through ratio is again 0.5; for two firms (duopoly) it is two-thirds, and so on. If the number of competitors becomes very large, the pass-through ratio comes close to 1—ie, all cost changes are passed on to prices in full. This is similar to the outcome in perfect competition where all industry-wide changes in costs are immediately reflected in the market price.

Again, it follows that the pass-through ratio depends neither on the size of the cost change nor on the market elasticity. Also, the size of the market share held by the firm making the cost saving is irrelevant (this is only a significant factor for the absolute amount of average cost saving across the market, but not for the pass-through ratio).

### 'Fair share of the benefit'

Assessing whether consumers receive a fair share of the benefit under the 'second exemption condition' of Article 81(3) is complex and subject to debate. It depends on many factors, of which the cost pass-through ratio is only one. The Commission's effort to issue guidance on Article 81(3) has generally been welcomed.

However, the Commission has perhaps unnecessarily complicated this assessment by making the following statement on cost pass-through in its Draft Notice:

The fact that undertakings may have an incentive to pass on certain types of cost efficiencies does not imply that the pass-on rate will necessarily be 100 per cent. The actual pass-on rate depends on the extent to which consumers respond to changes in price, ie, the elasticity of demand. The greater the increase in demand caused by a decrease in price, the greater the pass-on rate. This follows from the fact that the greater the additional sales caused by a price reduction due to an increase in output the more likely it is that these sales will offset the loss of revenue caused by the lower price resulting from the increase in output. (Para 87)

This statement is incorrect: the elasticity of demand is usually a crucial aspect of assessing market power, and therefore of relevance to Article 81 cases; however, it is *not* of relevance to the pass-through rate. This can easily be seen from the monopoly and oligopoly models described above, where the pass-through ratio was shown to be independent of market elasticity.<sup>8</sup>

### Pass-through in damages claims

Cost pass-through is also important when assessing the harm to consumers caused by general anti-competitive behaviour, in particular, damages claims. In cases involving intermediate goods, one aspect of a damages claim may concern the extent to which the price increase, brought about by anti-competitive behaviour, was absorbed by the direct users or passed on to other users further downstream.<sup>9</sup> This is particularly relevant for damages to a group of consumers as a whole (damages to individual consumers are more difficult to assess).

A recent example of such a case would be that of the organic peroxides cartel case in December 2003, in which the Commission levied nearly €70m in fines on five chemicals producers (the sixth cartel member avoided a fine under the leniency rules).<sup>10</sup> Organic peroxides are used as input by the plastics and rubber industries, both of which have arguably suffered because of higher input prices.

Hypothetically, if both plastics and rubber producers were to claim for damages suffered as a result of the artificially high prices charged by the cartel; the amount of damages awarded would depend on, among other factors, the extent to which these producers had to absorb the price increases or were able to pass them on to their own customers further

<sup>4</sup> European Commission (2003), 'Draft Commission Notice on Application of Art.81(3) EC', *OJ C 243/62*, October 10th.

<sup>5</sup> These results are based on the standard Cournot oligopoly model and linear demand. However, the main conclusions remain valid, even if some of the assumptions are varied.

<sup>6</sup> Technically, in the Cournot equilibrium, price  $P$  equals  $(a + c_1 + c_2 + \dots + c_N)/(1 + N)$ , where  $c_i$  denotes the marginal cost of firm 1, etc. The ratio of a change in  $P$  with respect to a change in any of these individual cost levels is therefore  $1/(1 + N)$ .

<sup>7</sup> Again, if the demand curve is convex rather than linear, the pass-through ratio is slightly higher; if the demand curve is concave, it is slightly lower.

<sup>8</sup> The Commission may have based this statement on a report it commissioned from Stennek and Verboven in 2001, in which the same conclusion is drawn. See Stennek, J. and Verboven, F. (2001), 'Merger Control and Enterprise Competitiveness: Empirical Analysis and Policy Recommendations', *European Economy*, 5:3. The confusion arises because Stennek and Verboven consider pass-through elasticities—ie, the percentage change in price divided by the percentage change in cost—rather than pass-through ratios, which simply give the absolute change in price divided by the absolute change in cost. The latter allows for a more straightforward analysis.

<sup>9</sup> Other aspects of damages apart from cost pass-through include the profits foregone by users and the deadweight welfare loss to society. These are not assessed in the example below. See also the October 2003 edition of *Competing Ideas*.

<sup>10</sup> Case COMP/37.857, *PO/Organic Peroxide*, December 10th 2003.

downstream. Arguably, the more the cartel price has been passed on, the less damage is suffered by direct users.<sup>11</sup>

For the sake of this example, if the plastics industry is highly concentrated, whereas the rubber industry is highly competitive, which industry would be awarded greater damages? A common perception in competition policy is that competitive industries find it more difficult to pass on cost increases than non-competitive industries. For example, in 1994, the UK Monopolies and Mergers Commission (MMC, now the Competition Commission) stated that, ‘because of competition among retailers, increases in trade prices would not necessarily be reflected in retail prices’.<sup>12</sup> In other words, the MMC believed that, because retailers are competitive, they would not be able to pass on in full any increases in the trade price at which they had to buy the product concerned. As such, the rubber industry would suffer most damages in the hypothetical example because it is more competitive.

However, this analysis indicates that this perception is incorrect: the more competitive an industry is, the more any industry-wide cost increases or decreases are passed on to consumers further downstream. This follows directly from the cost pass-through ratio in an oligopoly—ie,  $N/(1 + N)$ . From the perspective of both the plastics and rubber industries, the price increase by the organic peroxides cartel is equivalent to an increase in cost. Since (as assumed in this example) rubber is a competitive industry with many players, the pass-through ratio will be closer to 1; in contrast, the plastics industry has fewer players; thus, the pass-through ratio will be closer to 0.5.

Therefore, abstracting from other possibly relevant factors—eg, profits forgone by individual firms—the plastics

industry has suffered greater damages because it was forced to absorb the cost increase at the expense of its own profits (evidently, those profits were higher at the start than in rubber, but this is irrelevant for the damages calculation). The rubber industry was already competitive; consequently, pricing was close to marginal cost, and the increase in marginal cost (due to the higher cartel price) was simply passed on to consumers.

## Conclusion

The economics of cost pass-through produces some straightforward and fairly general results:

- even monopolists do not keep cost savings all to themselves; they tend to pass on at least half of these savings in order to lower prices;
- the pass-through ratio gradually increases to 1 as the number of firms in the market increases;
- the cost pass-through ratio is independent of the elasticity of demand, contrary to what is suggested in the European Commission’s draft guidance on Article 81(3);
- competitive industries normally pass on a higher proportion of industry-wide cost increases than those that are less competitive.

Nevertheless, these results may appear somewhat counterintuitive, and are consequently not always understood or correctly applied in competition policy. While real-world cases are always more complicated than the theoretical models, the basic logic of the above results must still be taken into account when assessing consumer benefits or detriment in merger and agreement cases, or when calculating damages.

<sup>11</sup> This analysis does not address the legally complicated issue of whether consumers further downstream would have the right to claim damages of their own.

<sup>12</sup> MMC (1994), ‘Contraceptive Sheaths’, Cm 2529, March, para 8.114. This statement was not made in a damages case but in a different context—ie, the pricing of condoms.

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