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A Three-Step Structured Rule of Reason to Assess Predation under Article 102*

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1 INTRODUCTION

Of all abuses of dominant position, predatory price is often perceived as the easiest to administer under Article 102 of the EC Treaty. To detect predatory prices, the European Court of Justice set forth in its AKZO decision a legal rule based on a price-cost comparison. This formalistic rule is deceptively difficult to apply, and unduly lengthens investigation. More significantly, the AKZO price-cost rules are at odd with a sound economic approach. These price-cost tests can fail distinguishing between hard-nosed competition that benefit consumers and true predation. The poor identification property of the legal test can lead to both over-enforcement and under-enforcement, and in both cases work at the detriment of consumers.

Over-enforcement results because below cost pricing is a poor proxy for predatory conduct: there exists a host of pro-competitive reasons justifying below-cost pricing. This over-enforcement encourages weaker competitors to make frivolous complaints to competition agencies to fend off competition from dominant firms. Besides, over-enforcement promotes more collusive behavior in the market.

Under-enforcement may result for two reasons. First, difficulties in measuring, allocating and comparing costs (and prices) can frustrate even the most committed and resourceful competition agency. Second, apparent above-cost pricing can be predatory, potentially deterring (i) more efficient entrants, who have not yet reach sufficient scale or (ii) less efficient rivals, which partly exercise a competitive constraint on the predating firm. Under-enforcement may cause firms with significant market power to try to establish a reputation for toughness in order to deter entry into their markets.

We propose an alternative analytical framework that closely mirrors the modern economic definition of predation. An action is predatory if it entails a profit sacrifice relative to some more profitable alternative, but for the elimination or disciplining of rivals and the subsequent increase in market power. In other words, predation is irrational unless this would exclude or permanently discipline rivals, allowing the predator to likely recoup the initial sacrifice. It follows that proof of predation involves showing three elements. First, the defendant has sacrificed profits. Second, as a result, one or more rivals have or likely will be excluded from competing with the alleged predator in some markets. Third, once rivals are excluded or disciplined, the alleged predator can exercise increased market power and thereby recoup the initial sacrifice. Further, even rational predation may not be abusive if the defendant can show that the initial profit sacrifice leads to market expanding efficiencies. Such efficiencies must be shown to fully offset the incentive to raise prices resulting from the exercise of increased market power after rivals are excluded.

We consider the time is ripe for an overhaul of the European legal rules on predation by taking into account the last twenty-five years of economic advancement. A significant step in this direction was the adoption by the European Commission in late 2009 of the Guidance Paper on enforcement priorities in applying Article 102 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (henceforth the Guidance Paper). Indeed, the Guidance Paper presumes that below-cost pricing, though generally indicative of profit sacrifice, in itself is neither a sufficient nor a necessary condition to identify predatory conduct - not even by dominant companies. In line with our proposed approach, the Guidance Paper, explicitly adopts the economic definition of predation as the starting point for the assessment. Namely, for conduct such as below cost pricing to be considered an infringement of article 102 it must be shown first that it entails a profit sacrifice relative to some more profitable alternative. Next it must be shown that the sacrifice leads to "anti-competitive foreclosure", that is, the conduct:

- (i) likely excludes or disciplines rivals exerting a competitive constraint on the dominant firm and
- (ii) this increases its market power allowing it to recoup its initial profit sacrifice – for example by raising prices beyond pre-predation levels – thereby harming consumers.

In this paper, we set out the reasons supporting the adoption of a structured rule of reason under Article 102 that should enable antitrust authorities and judges in Europe to distinguish predatory from competitive conduct. Our approach is in line with that sketched in the Guidance Paper. However, we offer further guidance for its practical implementation and we explain the dangers of a continued reliance on bright-line tests such as the Areeda-Turner rule or its legal counterpart, the AKZO approach.

We note that EU legal standards do not explicitly require any evidence that the alleged predatory scheme is rational (i.e. profitable). Hence, the need to show “likely exclusion” and “likely recoupment” could be seen as an additional burden on enforcement. This is not the case. First, it is not intrinsically difficult to establish the likelihood of exclusion and recoupment – it is more a matter of knowledge and experience. Indeed, as regards likely exclusion economic theory sets out simple and observable criteria to determine why rivals that are even more efficient may be excluded. Similarly, proof of likely recoupment can be based on a forward-looking analysis of market structure post-exclusion – similar to that undertaken in merger control. Second, the more convincing the evidence as regards likely exclusion and recoupment the less detail should be necessary to prove actual sacrifice. It is difficult to show below cost pricing in most cases. In any event, it is always a contentious exercise. Yet evidence regarding profit sacrifice could be inferred, *inter alia*, from the existence of more profitable alternatives absent exclusion. In such cases, the competition agency can challenge over-aggressive conduct where market conditions and other observable indicators support the claim that predatory conduct would be rational.

2 A PRIMER ON MODERN PREDATION THEORY

More than twenty-five years ago, Ordoover and Willig (1981) articulated the modern definition of predatory behavior as a strategy:

“that sacrifices part of the profit that could be earned under competitive circumstances were the rival to remain viable, in order to induce exit and gain consequent additional monopoly profit”.¹

Different varieties of business conduct may be considered “predatory,” but they generally fall into two categories. Predatory pricing is the best-known form of predatory behavior. It involves lowering prices to unprofitable levels in an effort to weaken, eliminate, or block the entry of a rival. Non-price predation involves making investments that would be unprofitable under normal competitive conditions that have the objective of weakening or eliminating competitors. Predatory investments could be made, for example, in excessive capacity, product differentiation, or advertising. Furthermore, businesses may adopt costly strategies designed to raise their rivals’ costs more than their own. Other forms of non-price predation involve technological tie-ins and exclusive contracting whereby a firm may increase the value offered to certain customers to reduce the ability of rivals to serve such customers and ultimately drive them from the market².

¹ Economists have given various essentially interchangeable definitions of predation. In “The Antitrust Paradox” Bork defines predatory pricing as price cutting “that would not be considered profit maximizing except for the expectation that either (1) rivals will be driven from the market, leaving the predator with a market share sufficient to command monopoly profits, or (2) rivals will be chastened sufficiently to abandon competitive behavior the predator finds inconvenient or threatening”. P. Bolton, J. Brodley and M. Riordan (2001), define predatory pricing as “a price reduction profitable only because of the added market power the predator gains from eliminating, disciplining or otherwise inhibiting the competitive conduct of a rival or potential rival. Stated precisely, a predatory price is a price that is profit maximizing only because of its exclusionary or other anticompetitive effects”.

² Some practices such as mixed bundling may be classified as predation when profitable if and only if rivals are excluded, leading to higher prices for the bundle or the individual components. On the other hand mixed bundling may also be a rational profit-maximizing strategy even in the absence of exclusion (e.g. because it leads to market expanding price discrimination). In such case, the practice is not predatory but may be still considered exclusionary. Similarly, raising rivals’ cost strategies do not fall under the definition of predation when they are costless to the firm. This is because they do not involve a profit “sacrifice”. Thus, its exclusionary character must be assessed according to a different set of conditions.

The Chicago School raised serious doubts about the possibility of predations actually occurring. Economists in the 1950s and 1960s showed that predation was generally an unprofitable strategy. Low prices are likely to reflect pro-competitive not predatory strategies. McGee (1958, 1980) was the most persuasive proponent of this view. Although his criticism of predatory pricing is extensive, his most forceful argument is that predatory prices are only temporary. Recognizing that the predator is incurring a temporary profit sacrifice, the prey knows that eventually the predator will have to raise prices to either reap larger economic profits or simply stop selling at a loss. The prey just needs to wait for the predatory attack to end. Even if the prey is short of cash, it can rely on the capital markets to survive the temporary attack. Anticipating this resistance, the potential predator will never launch its assault. The predator has nothing to gain - it can only lose money. The crucial assumption underlying MacGee's reasoning is that predatory prices are common knowledge. The prey knows that the predator is setting temporary low prices that are not sustainable, and the predator knows that the prey knows this.

In the early 1980s the Chicago School's view was challenged with the emergence of modern economic theory. Using game-theoretic models, economists have shown that under circumstances of asymmetric or imperfect information predation may be a profitable strategy. Today the established models of rational predation include three main scenarios all deriving from informational asymmetries regarding demand, the prey's performance, or the predator's competitive advantages in one or more markets. These modern theories provide a justification of why the prey will exit (or fail to enter) and how the recognition of such possibility provides the motivation for a rival firm to predate. Three major motivations have been formally articulated³. A firm may launch into a predatory attack to:

- (i) drive a financially constrained competitor out of the market
- (ii) gain a reputation as an aggressive competitor; and
- (iii) send a signal to potential entrants to deter new entry. The signal may be that either demand is weak or that the incumbent's costs are low. In either case, the intended message may be that there is no prospect of profitable entry.

A common thread is the presence of imperfect information that can be successfully exploited by the predator. These theories explain why the prey does not sit out the predatory attack in the expectation that the predator will raise prices later - rebutting McGee's argument. The formal economic proof of these predation theories is often complex. In the following subsections, we sketch the economic reasoning. A good exposition along with some intuitive discussion can be found in Tirole (Chapter 9, 1988), Rey and Tirole (1997), Bolton et al. (2000) and Motta (Chapter 7, 2004).

2.1 PREDATION TO ELIMINATE A FINANCIALLY CONSTRAINED RIVAL

The idea that an incumbent firm with extensive internal financial resources (i.e. deep-pockets) may successfully prey upon a financially constrained rival has a long tradition in antitrust. Telser (1966) was among the first to offer a formal exposition. He argued that if the prey must incur some fixed cost to remain in operation, then, by driving the market price below variable costs resulting in a loss at least as large as fixed costs the predator may exhaust its rival's reserves, driving it out of the market. Predation

³ Economists have identified other circumstances in which predation can be rational. For instance, Roth (1993) shows that predation can be an equilibrium strategy in a game in which players are uncertain about the strategies their opponents will be playing (e.g. how long its rival will be willing to continue to fight for market share or how willing its rival is to settle for a particular market share). Cabral and Riordan (1997) show that economies of learning by doing might allow an incumbent to predate successfully even when information is symmetric. Welfare effects in this model are mixed. The predator may become a monopoly but its efficiency increases by moving down its learning curve faster. A monopolist with a lower marginal cost charges a lower price, so it is plausible that consumers might benefit in the end.

would be both feasible and rational, provided the monopoly rents the predator receives once exit has occurred are sufficient to compensate for the reduction in profits during the predatory episode.

Telser assumed that the prey's ability to raise debt was limited and that the potential predator knew that limit. However, he offered no formal explanation of why the prey was financially constrained. Although it is admissible to assume that the predator has a larger war chest, it is unclear why the financially constrained firm cannot borrow funds when facing a predatory attack. The mere availability of such funds would deter the predator from ever attempting to predate and so the actual prey will never have to call upon its line of credit. Thus, Telser does not satisfactorily resolve Chicago School's proposition that the prospect of long-term profitability would lead the prey to stay in the market.

The modern theories of predation focus on the relationship between the potential prey and its lenders (be they banks, equity holders, or other financial institutions)⁴. The predator exploits the fact that lenders do not have complete information that allows them to assess the prey's performance. In this situation, the incumbent may predate to reduce the prey's profits. Investors observe the profit deterioration, but cannot tell whether it is caused by predation or by inefficient management. For example, the prey may have invested in overly risky projects or the managers may have appropriated the funds for its private benefit.

The lenders face a dilemma. A continuing supply of funds sufficient to deter predation invites opportunistic conduct by the prey. On the other hand, if the lender attempts to impose financial discipline on the firm with repayment obligations and collateral requirements, it may invite predation by rivals. It can be formally shown (see Bolton and Scharfstein, 1990) that there is no fully satisfactory solution to this dilemma. Indeed, the lending contract that minimizes agency problems will maximize the incentive to predate. Under these circumstances, lending to the prey becomes more risky, and banks or other investors may reduce or withdraw their financial support⁵. Ultimately, the lender can protect its interests by demanding the prey to put up a significant fraction of its own capital (such as retained earnings) as collateral. In that case, only firms with access to significant internal resources may be able to raise external finance to fend off a predatory attack.

2.2 PREDATION TO ACQUIRE A REPUTATION FOR AGGRESSIVENESS

An incumbent may engage in predatory pricing in one market to drive out existing rivals and build as result a reputation for toughness. The predator can benefit from this reputation in the future either on the same market or on other markets⁶. After having observed that competition is unprofitable when facing the incumbent future potential entrants would stay out. Such a reputation will allow the predator to enjoy monopoly profits in other markets without the cost of fighting a price war in each one of them.

The reputation effects of predatory behavior may arise in particular if the predator operates in multiple, closely related markets. For instance, in airline markets, because each city pair defines a separate market

⁴ The modern theories of financial predation rest on theoretical developments laid down by economists in the 1980s about the optimality of debt contracts – see in particular Gale and Hellwig (1985).

⁵ Consumers are unlikely to provide a source of support to the prey. Although it is in their interest to maintain competition in the long run, individually customers have a private interest in buying from the predator at a lower price. As a result, customers are trapped in a prisoners' dilemma.

⁶ Fudenberg and Tirole (1985) and Easley, Mason and Reynolds (1985) show, respectively, that low prices can convince rivals that fundamental market conditions are inherently bad, inducing their exit or preventing further entry. Saloner (1985) also presented a model where predation is aimed at "softening up" a rival in order to improve the terms of take-over.

a predatory campaign on a single route or a few routes may be sufficient to deter entry on many other routes⁷.

To be effective a reputation for predatory conduct relies on the potential entrants being able to identify the incumbent's strategy as predatory. This means that rivals that are present or intend to enter many of the same markets where the predator is active are more likely to regard the incumbent's predatory behavior as credible⁸. The need to have potential entrants observe an aggressive response seems risky if predation is illegal – but it does not imply that Courts or a competition authority can always determine that predation has been practiced.

2.3 PREDATION TO MISLEAD RIVALS IN BELIEVING THE MARKET IS UNPROFITABLE

Most firms contemplating entry or exit from an industry do not have all the relevant information to determine future revenues and costs. To the extent that an incumbent firm is better informed about cost or other market conditions, it can manipulate and distort market signals about profitability to influence the expectations of its rivals through its pricing decisions or other actions. Predation, in this context may be rational because a firm's decision to enter or to leave a market is necessarily based on its evaluation of expected future costs relative to incumbents and demand conditions. The prey can be deceived in three ways that we briefly describe below.

Predation to deceive the prey in believing the predator has low costs⁹

To illustrate this strategy consider a world where there are only two types of incumbent, a low cost and a high cost incumbent. Suppose that a potential entrant does not know which type of incumbent it would face should the entrant decide to enter the market. In a two-period game, the entrant may infer this information by observing the incumbent's price level in the first period and decide whether to enter or not in the second period. A high cost incumbent could attempt to deceive the potential entrant by pricing to level similar to that of a low cost incumbent. The entrant would then hesitate to enter the market in the second period. However, such a strategy will not always succeed. Because entry would lower its profits, a low cost incumbent would not like to be mistaken for a high cost type. In such a model, there are two possible outcomes that are described below.

In the first period, the low cost incumbent will set a price lower than it would under normal conditions (when it is the only active firm). The price is set so low that no high cost incumbent would risk matching it because it would involve excessive losses. As there is no scope for copying the low cost incumbent, the high cost incumbent will choose its normal monopoly price, and therefore has no hope of deterring entry. The entrant can anticipate which incumbent it will face in the second period. When the price is low in the first period, the incumbent is low cost, and the entrant will stay out. If the price is high, the entrant will face the high cost incumbent, and will enter¹⁰.

⁷ Yamey (1972), Posner (1976), and Scherer (1990) have noted that predation in one market may lead to entry-detering demonstration effects in this and other markets in which the predator operates. Depending on the magnitude of such effects, predation could be a present-value-maximizing strategy. Formal models of reputation creation through predation have been advanced by Kreps and Wilson (1982a) and Milgrom and Roberts (1982b).

⁸ Note that in models of cost signaling or test-market predation the prey suspects is being subject to predation but precisely because it is not certain, it prefers to exit. Thus these motives to predate are inconsistent with the "reputation" motive.

⁹ For a formal model, see Milgrom and Roberts (1982a).

¹⁰ This is a separating equilibrium. The high cost incumbent cannot mimic the low cost incumbent and deceives the potential entrant.

Suppose instead, there is no price at which the low cost incumbent can profitably sell its product and be distinguished from the high cost type. As a result, the low cost incumbent simply sets its price at monopoly level and the high cost incumbent will imitate it in order to deter entry. In the first period, the high cost incumbent sets a lower price than it would otherwise, but by doing so it misleads the entrant into believing that the incumbent is a low cost type. Based on the first period price level the potential entrant cannot tell whether the incumbent is high or low cost¹¹.

Note that in the second situation, predation is rational and the pre-entry price might be above or below the incumbent's costs. What really matters is that the incumbent's price is below that of the prey so that the latter believes that it would be unprofitable to enter¹².

Test-market predation and signal jamming¹³

Consider a potential entrant that seeks to introduce a new product or brand to compete with an existing product. Assume the entrant lacks knowledge and experience in the market and does not know whether demand is high or low. If demand for the entrant's new product is high, entry is feasible. Alternatively, if demand is low, entry is not profitable as entry at full efficient scale is expensive. Without additional information on demand conditions, the expected profitability of entry may be negative and the entrant would stay out because possible losses are too high to justify the entry gamble.

However, the entrant may be able to test the market by introducing its new product on a limited basis, e.g. in a small geographical region. In this way, the entrant can gain sufficient information about future sales to determine whether entry will be profitable. The potential gain from successful entry fully justifies the cost of the market test. However, the incumbent firm (the predator) may frustrate the market test in two different ways, both involving price-cutting.

- (i) The incumbent can secretly cut price in the test-market to reduce the entrant's sales and thereby induce it to believe that demand is too low to justify market entry or to enter on large scale. This strategy is known in the economics literature as test-market predation.
- (ii) Alternatively, the incumbent can publicly cut its price, thus distorting the data the entrant receives from its test market experiment. The entrant may know that its demand is artificially low due to the incumbent's low prices. However, the incumbent strategy jams the market signals. That is, the entrant cannot have any information about the level of demand in normal competitive conditions. In the absence of this necessary information about demand, the entry gamble will not pay so no entry is attempted. This predatory strategy is known as signal-jamming.

¹¹ This is a pooling equilibrium, as the low cost incumbent cannot be told apart from the high cost incumbent. Cost signaling predation may not only deter entry but also drive existing rivals. For example, consider an industry that has only two firms. Both firms have the same costs initially, but one firm, say firm 1, may be able to reduce its production costs through an important technical innovation, management change, or exclusive access to a cheap input. Whether this happens or not Firm 1 may reduce its prices to signal that, it has achieved a cost breakthrough. A strategic analysis of cost signaling shows that under a range of plausible conditions, the victim will leave the market even though it strongly suspects the predator is bluffing.

¹² In some signalling games, a strategy to deter entry may result in higher prices. This would occur if the entrant is not certain of the cost it would incur once it enters the market. The entrant might think that it would have similar costs as those of the incumbent. Anticipating the entrant's expectation, the incumbent, by selecting a high price level, send a signal that costs are high in this industry. Observing the high price, the entrant would hesitate to enter in the second period. See Harrington (1986).

¹³ See Scharfstein (1984) or Fudenberg and Tirole (1986)

Predation to deceive the prey in believing demand is weak¹⁴

Rational predation may also emerge where one firm is better informed about demand conditions than its rival. In this case, the predator may reduce prices to convince the prey that market conditions are unfavorable and that aggregate demand is too low to justify the continued presence of both firms in the market or a major expansion drive by the prey. The prey, falsely inferring a weak level of demand from the predator's low price, may exit.

However, this form of predation is less plausible in practice. It seems unlikely that one firm can have superior information about aggregate demand than its rivals. Furthermore, a less informed incumbent would be able to retrieve information about demand from its own experience and accurately interpret market trends.

In all of the modern economic theories of predation, the predator is able to either exploit asymmetric and imperfect information or jam market signals to manipulate the prey's expectations about the profitability of staying or entering on the market. This strategy need not involve setting price below costs; however, it does imply that the predator behaves differently from normal competitive conduct.

3 WHY IS THE AKZO RULE INADEQUATE TO ASSESS PREDATION?

As the section above has shown, economic models of predation involve a dynamic strategy whereby the predator sacrifices profit to take advantage of information asymmetries. This aggressive conduct has only one purpose: to deter entry or drive existing rivals out of the market to allow the predator to reap monopoly profits in the recoupment phase. Yet, to detect predatory prices, the European Court of Justice (ECJ) in the AKZO judgment (1986) set a legal test based on a static price-cost comparison. The ECJ held in AKZO that (i) prices set by a dominant firm below its average variable costs are presumed abusive, (ii) prices above average variable costs but below average total costs are abusive if they are intended to eliminate a competitor¹⁵.

The legal standard does not contain an explicit requirement to show the possibility of recoupment. In the AKZO judgment, the ECJ also noted that a dominant firm has no interest in pricing below cost "except that of eliminating competitors so as to enable it subsequently to raise its prices by taking advantage of its monopolistic position" (§71). Consequently, it can be argued the Court presumes recoupment and does not expressly require the need to prove it in order to establish predation. In Tetrapak the ECJ upheld the decision of the Court of First Instance, which declined to lay down the prospect of recouping losses "as a new pre-requisite" for establishing the existence of predatory pricing, observing that it must be possible to penalize predatory pricing whenever there is a risk that competitors may be eliminated¹⁶. The recent ECJ decision in the Wanadoo case has similarly endorsed the AKZO test.

¹⁴ See Roberts (1986)

¹⁵ In 2007 the ECJ upheld the AKZO rules rejecting the appeal by France Telecom against the European Commission's decision. The court's judgement recalled that "prices below average variable costs give grounds for assuming that a pricing practice is eliminatory and that, if the prices are below average total costs but above average variable costs, those prices must be regarded as abusive if they are determined as part of a plan for eliminating competitor. FranceTelecom SA v Commission of the European Communities, Case T-340/03, paragraph 130.

¹⁶ The Court of Justice added in that judgement that "it would not be appropriate, in the circumstances of the present case, to require in addition proof that Tetra Pak had a realistic chance of recouping its losses." Tetra Pak v. Commission, C-333/94P, paragraph 44. In the recent judgement, FranceTelecom v. Commission, (2007), T-340/03, the Court of First Instance recalled the principle of Tetra Pak and added that "it was not necessary to establish in addition proof that WIN had a realistic chance of recouping its losses." This view was later endorsed by the ECJ.

This prevailing legal standard is grossly inadequate to identify predation. The price-cost rules fail to correctly discriminate between a genuine competitive response and an “abuse of dominant position”. The AKZO test and their variants, while potentially informative regarding actual profit sacrifice, are in fact neither necessary nor sufficient to demonstrate the rationality, and thus the existence of predatory conduct. In fact, the price-cost comparison is simply not grounded in modern economic theory. Furthermore, by not requiring evidence on recoupment, the legal standard omits an integral part of predation¹⁷, which makes it incomplete. A proper assessment of recoupment possibilities would allow a competition agency to weed out improbable predation claims.

3.1 PRICE-COST RULES RECEIVE LITTLE SUPPORT FROM ECONOMIC THEORY

Areeda and Turner (1975) were the first to propose the use of price-cost comparisons to identify predation – specifically predatory pricing. They conjectured that if a firm sets its price below some pre-defined cost benchmark it must be predating because there is no other rational explanation. Conversely, if prices remain above costs only less efficient competitors are excluded. This argument had much appeal at a time when economists were unable to prove rational predation and courts were increasingly concerned about the chilling effects on competition of anti-predation policies. Areeda and Turner offered a defense against the abuse of antitrust laws by firms unable or unwilling to compete on the merits against a more efficient and innovative incumbent.

Alas, not only Areeda and Turner’s idea is flawed, but they also fail to base their test on a sound economic theory of predation. Commenting on the Areeda-Turner proposal, Scherer (1976) already pointed that price-cost comparisons were ad-hoc, based on static view of monopoly and non-strategic competition. He warned, “Courts that attempt to substitute simple cost rules for such analyses of effect and intent in alleged predation cases are likely to reach economically unsound decisions”.

In economic models of rational predation “below cost pricing” does not emerge as a sufficient condition. Essentially, for the reason McGee pointed out: if prices were later expected to increase, rivals would not be deterred or driven out of the market by prices below average costs. Other elements need to be present for a predatory strategy to pay-off.¹⁸

For example, common to all models of financial predation is the assumption that the predator has unconstrained (or cheaper) access to financial resources (e.g. due to size, internal source of revenues, efficient monitoring by external creditors or a better credit rating) and can sustain financial losses for a longer period. In contrast, the prey is financially constrained and informational asymmetries, endemic to capital markets, exist between the firm and its lenders or investors. Absent these conditions, predation would fail. Temporary below cost pricing is more likely driven by pro-competitive not predatory motives, turning Areeda and Turner’s assumption on its head.

Similarly, below cost pricing is not sufficient when an incumbent predates to acquire a reputation for aggressive behavior. The predator can price exactly and permanently at average total cost in one market reducing all prospect of profits, even for itself. If potential entrants in other markets in which the predator is present are led to believe that it will always respond to entry by pricing at average total cost, they may prefer to stay out rather than assume the risks associated with entry. If this strategy actually deters entry into other markets, the incumbent can then exercise market power on those markets.

¹⁷ The Irish Competition Authority has considered the possibility of recoupment in its Drogheda decision, and the UK Competition Commission has also relied on the implausibility of recoupment to dismiss predatory pricing claim in its Final Report on the Supply of Groceries, published in 2008.

¹⁸ Ordover and Saloner (1987) noted that: “... [I]n fully specified models of reputational and signaling predation ... successful predation does not necessarily require prices below MC (i.e., marginal cost) or AVC. It requires, however, prices that convey to the rival the signal that it should not enter or remain in the market. Such prices bear no systematic relation to the incumbent’s AVC.”

Strikingly, below cost pricing is also not a necessary condition in financial predation models. This is because the cost of capital to the prey is endogenously increased by the threat of predation. By lowering its prices, the predator increases the (capital) costs of the prey. The point at which it is unprofitable for the prey to enter or remain in the market may be reached before the predators' prices fall below its costs. Unsurprisingly, "below cost pricing" is not even a necessary condition (let alone sufficient) in signaling models. For instance, in the model proposed by Milgrom and Roberts (1982a) where a high-cost incumbent lowers its prices to mislead a potential entrant into believing it has low costs and entry would be unprofitable. The incumbent prices low to deter entry but prices need not fall below its own cost. All that matters is that the entrant's expectations about future profitability be reduced.

Finally, capacity constrained firms, even if dominant, will be unable to predate successfully. Indeed predatory pricing requires both a price decrease and an output increase. Price cutting alone will not work because the objective is to take market share away from rivals. What matters is not whether the predator is dominant but whether it owns spare capacity to cover (temporarily) what was supplied by those rivals and possibly any additional demand stimulated by the price decrease. Therefore, if prices are found below the relevant measures of costs, there might be other reasons justifying these price levels other than predation¹⁹.

3.2 THE DEFENSE FOR THE LEGAL PRICE-COST RULES IS UNCONVINCING

What is the rationale for the continued use of price-cost tests? Honestly, we do not really know. The ECJ is not legally bound by its own past decisions and thus its apparent continued support for price-cost tests as a sufficient indicator for predation is somewhat puzzling. Supporters of these tests argue that pricing below average variable cost must be predatory, because it is unprofitable unless it is part of a strategy leading to higher prices later. However, this reasoning is not only circular it is also mistaken as we explain below. First below-cost pricing can be pro-competitive, second above-cost pricing can be anti-competitive and third price-costs are hardly reliable. Finally, they are extremely hard to implement, even in the best of circumstances. In light of this insisting on bright line rules to detect predation is thus likely to create legal uncertainty, rather than reduce it²⁰.

3.2.1 THERE ARE MANY PRO-COMPETITIVE JUSTIFICATIONS FOR BELOW-COST PRICING

A firm may price below its cost to promote a new product or enter a new market, reduce costs through learning-by-doing, or increase the value of its product through network externalities. Such pricing is essentially dynamic in that the price cutter anticipates that lower costs or increased marketing efficiency in the future will compensate for present losses. Bolton et al. (2000) discuss extensively why a firm may legitimately lower prices in the context of (i) promotional pricing, (ii) learning by doing and (iii) network externalities.²¹

In the presence of two-sided markets a shortsighted analysis based on one side of the market would easily characterized a low price as predatory. A well-known example of two-sided market is the business model of the Adobe Acrobat Reader and Writer. While the Acrobat Reader is offered free over the internet, arguably below any reasonable measure of cost, Acrobat Writer is sold for a fee. The rationale behind this pricing strategy stems from the fact that the incentive to purchase and create files with Acrobat Writer is greater when there is a large number of users that have Acrobat Reader installed.

¹⁹ But note that market-expanding efficiencies would not be a plausible explanation in this context either.

²⁰ Except in the US, where the use of bright line rules provides much legal certainty that practically all predatory conduct will go undetected.

²¹ For a detailed explanation of how to account for these market-expanding strategies, see Bolton et al. (2000) pp.2276-2282.

Yield management pricing may also lead to apparent below-cost pricing. For example, the adoption of yield management in the airline industry has led to the offering of extremely low fares, in particular by low-cost carriers. Low-cost airlines have championed highly discounted fares. Although these fares are available to only few passengers, the 1 Euro one-way fare would appear clearly to be below any measure of cost of transporting one passenger.

UK supermarket chains have been accused of predatory pricing as they set the price of some products, e.g. beer, below costs. Yet the benign explanation is that supermarkets set a loss-leader strategy on a select group of products in order to increase footfall²².

There may be other reasonable examples of below-cost pricing generating efficiencies. In general, these practices tend to expand demand, but so does predatory pricing. In this context, how does one discriminate between predation and legitimate market-expanding strategies when observing below-cost pricing? A price-cost comparison alone cannot. Only a thorough analysis of the alleged predator's conduct enables the investigator to discriminate between harmful predation and an efficiency-enhancing practice.

3.2.2 SUCCESSFUL PREDATION ON LESS EFFICIENT RIVALS CAN REDUCE CONSUMER WELFARE

It is often argued that efficient incumbents must be allowed to take advantage of their superior efficiency to set their prices at whatever level they deem appropriate. As long as the price remains above cost, it is perfectly legitimate for a firm to temporarily, set prices below its short-run profit maximizing level. A safe harbor for above-cost pricing reduces the risk of chilling legitimate, hard-nosed competition. However, there are at least three compelling arguments in favor of penalizing above-cost predatory pricing under certain, even if uncommon circumstances.

First, the view that only below-cost pricing can injure "as-efficient" producers is not entirely correct because it fails to account for dynamic efficiency. Smaller rivals or potential entrants may have access to the same technology as the incumbent, yet they face much higher average costs. Because production is subject to increasing returns to scale, the incumbent may price above its average total cost but below its rival's average cost. The rival might take a long time to increase its demand to levels that would yield costs as low as those of the incumbent. For this reason, the incumbent might be able to engage successfully in predation with above-cost pricing. The possibility of above-cost predation can be seen as arising from cost asymmetries not from an absolute cost advantage of the incumbent. And if potential entrants anticipate being driven out of the market shortly after entry, they will typically not enter at all.

Consider for example the airline industry. On many routes, an incumbent airline dominates the market and sells at a price above its costs. Periodically, another airline enters the market at a lower price. The incumbent airline then lowers its price to beat (or match) the entrant, prices remain above the incumbent own costs. However, because the entrant has higher costs (or lower quality), it cannot compete at the new price and is driven out of the market. Moreover, it can never reach sufficient scale to minimize costs. Once the less efficient entrant is safely gone, the incumbent re-establishes the old price.

Second, relative efficiency is a multi-dimensional concept and cannot be based solely on observed costs differences. The price-cost tests implicitly assume that firms are identical except with respect to average costs, which determines their relative efficiency. However, in reality this assumption is often untenable. Firms may have similar costs and prices yet differ in the quality of their products or services, location, or

²² In its 2008 Final Report on the Supply of Groceries in the UK, the UK Competition Commission ruled out the possibility that systematic below-pricing on some products by large grocery chains be part of a predatory strategy. In particular, the absence of recoupment possibilities was essential in the Commission's findings.

conditions of supply. The products they offer may be differentiated (or branded), targeting slightly different customer segments within the same relevant market. Some firms may offer a single product others may be multi-product companies and may sell (or produce) several goods in combination. Firms may also differ in the ability or incentive to invest in future product development.

The argument that price-cost tests protect as efficient rivals is thus misguided. Observed costs are just one dimension of efficiency. For instance, a predator may over-invest in quality, innovation or any other important dimension of competition such as frequency of service. Prices may be higher than own costs, maybe even higher than rivals' costs. However, the quality-adjusted (or innovation-adjusted) price may still be the lowest and could thus be predatory under appropriate conditions.

Third, the presence in the market of a "less-efficient" competitor may be beneficial in terms of consumer welfare. In every market, some firms are more efficient than others, yet workable competition is still valuable. Even when one firm is far more efficient than others so that it becomes dominant, the existence of less efficient firms may significantly constrain the pricing of that dominant firm. Prices may be above levels that would result if equally efficient competitors existed but may be far below the monopoly price.²³ A competition authority that has adopted a consumer welfare standard should therefore prevent predatory conduct that excludes rivals whose presence enhances consumer welfare, even if such rivals have higher costs than the predator²⁴.

3.2.3 BAYESIAN UPDATING SUGGESTS THAT PRICE-COSTS ARE NOT RELIABLE

A price-cost test is not even reliable in reducing type I errors, that is, in ensuring that a competition authority does not mistakenly confuse predation with pro-competitive aggressive conduct. When designing bright line tests one needs to consider two aspects. First, what is the probability of making an error and second, what are the consequences of making such error.

The probability of making an error depends on the accuracy of the test, but not only. Suppose we use a "price cost" test of predation implemented using the rule: there is predatory sacrifice if $P < ATC$. Now for the sake of argument, assume that in 90% of cases where a firm actually predares price will be below ATC - that is, there is a 10% risk that the firm engages in non-price predation. This is a fair assumption if one regards price as the main competitive variable. Where a firm predares by increasing the value of its product (say by expanding available capacity) price may be above costs and hence dismissing the possibility of predation would be a false negative.

Assume also that in 90% of cases where there is no predation $P > ATC$. That presumes there is a 10% risk that the firm engages in promotional or penetration pricing. This reflects a rather optimistic view of low prices as drivers of market expansion efficiencies, relatively speaking, in accordance with the prevailing view in the US that false positives are a very serious risk.

Is $P < AVC$ a reliable test to discriminate predation from competition? The answer to this question critically depends on the assumption regarding the incidence of predation by dominant companies. In light of the modern theories of predatory conduct discussed above, market circumstances for rational

²³ Fjell and Sorgard (2006) also argued that applying the "as efficient competitor" test will lead in some circumstances to situations where consumer welfare is reduced. The presence of "inefficient" competitors may constrain sufficiently the dominant firm to benefit consumers.

²⁴ Limit pricing poses a particular challenge in these circumstances. Limit prices, at a level that is above cost but below monopoly prices are generally desirable. However, a strategy of limit pricing may be indistinguishable from one of above-cost predation. In particular, it is difficult to establish whether the alleged predator has sacrificed any profits by pricing below monopoly levels. It can always claim that it was engaging in (desirable) limit pricing. The only way to discriminate between limit pricing and predation is that limit prices are sustained over time (because the threat of entry is permanent) whereas above cost predation leads to lower prices only as long as necessary to avert a temporary entry threat.

predation appear rather uncommon. Let us say as those concerned with over-enforcement might argue that only 1% of even dominant firms will find predation rational.

Now take 1000 dominant companies. Under the assumptions above, typically 10 are truly predating. If they predate the price-cost test comes positive in 9 cases (the remaining firm engages in non-price predation or above cost predation). The remaining 990 are not predating but the test can be inaccurate for them too. Up to 99 of them will price below ATC. So there are 108 positive results in total but only 9 are accurate. So for any case where $P < ATC$ the chance that such bright line test detects rational predation is in fact 8%. On what basis can a legal test that fails in 92% of cases be regarded as appropriate to guide enforcement? Arguably, if low prices are more rarely used to expand the market than assumed say in only 1% of cases (as opposed to 10%) then the test is less inaccurate since there are 19 cases of positive results of which again 9 are correct. In that case the accuracy of the test is a little below 50%. Again, hardly a good basis for decision-making. Note that the accuracy of the test increases also the more likely that dominant firms find it rational to engage in predatory conduct. Thus, ironically, for many of the proponents of price-cost tests that fear over-enforcement support for such tests makes sense only if one also believes that predation is rather common. So why are price-costs tests advanced as a way to prevent type 1 errors. Well, exactly for the wrong reasons, namely, because they are extremely hard to implement in practice, as we discuss below.

3.2.4 THE DIFFICULTIES IN MEASURING COSTS CREATE LEGAL UNCERTAINTY

Defendants of price-cost tests often argue they are operational and at the same time provide legal certainty. The price-cost rules rely on the relationship between the predator's price and cost, not those of the prey. This ensures a certain degree of legal certainty. Presumably, a firm knows its own costs and hence can avoid a predation claim by maintaining prices above costs.

However, in practice price-cost rules have proven difficult to implement even in the most stable and simply structured of manufacturing industries. First, we are not aware of any investigation that has not led to substantial disputes over how to calculate and allocate costs. The issue of common costs arises with multi-product firm and it raises practical difficulties. The allocation of costs related to advertising and promotion causes problems when expenses cover different markets and different products. Similar cost allocation (and pricing) difficulties arise when there exist economies of scope combined with network effects. For example, today's world of scheduled air carriers, working out of a hub-and-spoke network, is fundamentally different from the world in which economists in the 70s debated about cost-based tests of predation. In this world, the very concept of "a" cost for a particular spoke is a chimera. In an industry characterized by multiple products (different routes, categories or frequencies), extremely low marginal prices, and joint network costs, the cost of a particular seat on a particular route is impossible to calculate.

Second, dispute over of the identification of variable and fixed costs have become only too familiar. Economists classify variable and fixed costs based on the distinction between short and long run. Although analytically clear, this distinction is tenuous in practice.

Third, there are many unresolved issues about the treatment of costs in some markets, these include how to treat costs in industries with near-zero marginal costs, how to apply cost tests in situations in which equally efficient firms have different ratios of fixed to variable costs, what to do when, in declining industries, all firms have marginal costs that are below their variable costs.

Finally, appropriately defined economic costs will often be different from costs in the firm's books, which are collated according to accounting principles (rather than economic principles). None of these difficulties in identifying, measuring and allocating costs makes it particularly easy or swift to apply price-costs tests. The ensuing delays and controversy do not result in legal certainty either. In conclusion, the usefulness of price-cost tests is the exception, rather than the rule, and can thus not

form the basis for sound enforcement policy nor provide legal rules, that necessarily must apply in the general case.

3.3 DOMINANCE IS NOT EVIDENCE OF RECOUPMENT

A pre-condition for finding predatory prices consists of establishing the dominant position of the predator on the market where the predatory prices are occurring²⁵. It has been argued then that recoupment is in fact taken into account indirectly in the showing that the predator is dominant. The assessment of dominance necessarily calls for an analysis of entry and re-entry barriers so a separate recoupment condition is not adding anything new²⁶. This view is mistaken. Even if they have common elements, assessing the possibilities of recoupment does not replicate the assessment of dominance. As a result, dominance is neither sufficient for recoupment, and more strikingly, nor it is necessary.

3.3.1 DOMINANCE IS NOT SUFFICIENT FOR RECOUPMENT

Recoupment depends on whether the potential gains after exclusion more than offset the initial profit sacrifice. These potential gains derive from the difference in market power the predator enjoys after rivals are excluded. Recoupment is therefore likely if predation leads to a significant increase in market power. But, recoupment is not systematically related to dominance, which measures the level of market power of the predator before or during the predatory attack. Market conditions after predation are generally different to market conditions before predation. The market structure is not the same as rivals exit the market or potential entrants stay out. Consequently, an assessment of dominance during prior or during the predatory attack is a priori unreliable for gauging the ability of the predator to exercise increased market power post-exclusion.

To assess the possibility of recoupment a competition agency must first determine the extent to which the predator exercise of market power will increase after the prey's exclusion. And this depends on the extent of the competitive constraint the prey exerted on the predator. For example, if the prey offered close substitutes its exclusion is likely to allow the predator to increase prices significantly. None of this is taken into account in the assessment of dominance before the recoupment phase.

Recoupment depends also on the actual sacrifice level needed to induce exclusion. If to be successful a predatory strategy requires substantial losses, then the recoupment will also need to be substantial. Again, dominance offers little indication as the extent of the profit sacrifice required to induce exclusion.

In addition, there is at least one well identified situation for which dominance is poorly related to recoupment possibilities. As McGee (1958) argued, a firm leaving the market may recover some of its

²⁵ "In general predatory pricing will only be dealt with as an abuse under Article 82 if the dominant company applies it to protect or strengthen its dominant position. Usually it will do so by applying predatory pricing in the market where it has a dominant position." DG-Competition Discussion Paper on the Application of Article 82 (2005)

²⁶ Proponents of this view often argue that if dominance is not sufficient for recoupment one could allow defendants a "recoupment defense". That is, a defendant can rebut the presumption dominance implies likely recoupment. This approach is rather disingenuous. First, it shifts the burden proof regarding the competitive effects of predation from the competition agency to the firm. Namely, the agency must only show there was sacrifice but the firm must prove recoupment was unlikely. Second defendants will always prefer to rebut the dominance finding itself rather than the presumption that dominance leads to recoupment. Except in extraordinary circumstances, we would not expect a defendant to accept a finding that it is dominant. Thirdly, much of the information needed to assess the post-predation market structure such as the likely response of non-excluded rivals, potential entrants and customers, is more easily available to the competition agency. Without access to such information, it is unlikely that the defendant can build a defense by proving the impossibility of recoupment - precisely when it is innocent.

investments by selling out its assets to another rival or a potential entrant. The assets stay in the market, making it difficult for the predator to increase prices to recoup its losses. In this case evidence of dominance will not provide little indication as to the possibility of recoupment.

3.3.2 DOMINANCE IS NOT EVEN NECESSARY FOR RECOUPMENT

A successful predator need not enjoy dominance in the market in which it sacrifices profits. A reputation for toughness in the face of competition, earned through predatory behavior in one market, can spill over to other markets where the predator faces potential competitive threats. Predatory pricing in a small market minimizes the profit sacrifice. However, competitors may be deterred or delayed to entry or expand in larger markets where the predator operates. The elimination of the competitive threats allows the predator to raise prices in these larger markets.

Somewhat ironically, the most famous predatory pricing case in the EU is a good example of predation in one market to deter entry into a larger one - *AKZO Chemie BV v Commission (Case 62/86)*. The allegation in this case was that AKZO was attempting to limit the expansion of a competitor, ECS, into the European plastics market. AKZO held a "dominant" position in this market that might have been significantly eroded by the expansion of ECS. However, AKZO's alleged predatory conduct was not targeted in this market, but rather at the activities of ECS in the UK market for flour additives, a relatively small sub-market within the wider European market for organic peroxides. In fact, if the EU market for plastics was large enough and ECS and AKZO were close competitors the incentive to predate might have also existed even if AKZO had not been dominant in the larger market.

4 BEYOND PRICE-COST RULES

The economics of predation stand on strong game theoretic foundations. Under certain conditions, (most of which are empirically observable) predatory behavior by an incumbent firm is a profit-seeking course of action, which can foreclose or discipline competition leading to consumer harm. Equipped with the economist tool-kit, the use of a rule of reason is therefore superior to a formalistic approach. Detecting predation requires a thorough economic analysis of the industry, including the information structure in the market and the relevant asymmetries between the predator and its potential victims. Economic theory helps organize and structure the information gathered into a consistent framework of analysis.

4.1 WHY A THREE-STEP RULE OF REASON?

As the modern economic definition of predation makes it clear, a predatory strategy involves two distinct phases. In the sacrifice phase, the predator offers 'too much' value to consumers (e.g., its price is too low, its product or service quality is too high, or its product is too innovative) to reduce its rivals' profitability. In the recoupment phase, the predator exploits the fact that its rivals have been weakened or excluded and reduces the value it offers to consumers below the competitive level. Thus, when a predatory scheme is successful, even though consumers benefit from unrealistically high value for money in the short run, they ultimately suffer due to the loss of competition.

Although a predatory strategy involves two phases, three distinct elements arise from this mechanism, and these must be present for predation to take place. These elements will form the three steps of our structured approach.

4.1.1 THE THREE STEPS

First, the predator must sacrifice profits. Predation occurs only when a particular action entails a sacrifice relative to some more profitable alternative but for the elimination or disciplining of rivals. Fundamental to the understanding of predatory conduct is that initially the predator incurs some losses.

Second, the predator must have the ability to recoup its initial losses by exercising market power after the rivals have been foreclosed. It must be shown that recouping the initial losses is likely, and these losses can be recovered only by setting and sustaining a price higher than the price that would have been charged if the predatory attack had not eliminated or deterred competition.

It is the price increase post-exclusion that harms consumers. Thus, if the recoupment test indicates that there is little or no likelihood of recouping the initial losses, then predatory pricing would be neither rational nor anti-competitive. It is of no consequence that a firm's unilateral conduct may eliminate a competitor so long as the elimination of that competitor does not result in consumer harm. Only when prospects of recoupment exist, can there be a presumption that consumers will be harmed by losing more in the recoupment stage than they win in the sacrifice stage.

The two stages of a predatory strategy, namely profit sacrifice and recoupment, are not in themselves sufficient to identify predation. Some dynamic competitive behavior, where the dominant firm neither exploits information asymmetries nor build a reputation for aggressive conduct, could be characterized by a first phase of heavy price cutting and a subsequent phase of price increase. On the face of it this would fit the bill for a predation case, but a closer examination might reveal the absence of predatory strategy.

For example, Bagwell, Ramey and Spulber (1997) develop a dynamic model where initially identical firms battle for dominance. Their model is particularly well suited to explain development in the retail sector. In their model, economies of scale arise from firm's investment in selling technologies. The larger the firm is, the greater the reward from a cost reduction which applies over large sales volume. Another key element in this model is the fact that firms selling thousands of products, which imply that consumers are not well informed about current prices. In the competitive stage of the game, some firms select low prices (sometimes below cost) to earn a reputation for being cheaper. This strategy will pay off in the future as (i) consumers will eventually find out which firms are low prices, and (ii) these low price firms have a greater incentive to invest in cost-reducing technologies anticipating larger market shares in the future. In the future, firms that have opted for high prices in the short-run to exploit consumer imperfect information about current prices, will eventually be driven out of the market by the more efficient, low price firms. The high price firms, which had less incentive to invest in cost-reducing technology, become just too inefficient. Eventually, low price firms will raise their price relative to the

first phase²⁷. On the face of it, the pricing pattern of the market leader is similar to that of predatory pricing. However, this is not predation²⁸.

In this dynamic competitive model, some retail firms decide to acquire a low-price reputation, signalling that they are investing heavily in cost-reducing technologies. Lower costs will in turn lead to lower prices in the future. At the end of the day, only the most efficient firm(s) remains on the market. The high price firms have not invested enough in the first phase, hence they find it difficult to survive on the market.

This discussion shows that when investigating predatory claims, the competition authority must develop a cogent theory of harm. Therefore, we add another important step for the identification of a predatory attack. The negative impact on the prey's profitability is likely to induce its exit, reduce its scale or force it to stay out of the markets. It follows that "likely exclusion" should be proven in reference to some valid theory of rational predation. The various economic models presented in the previous section show how a prey may be induced to exit under certain economic circumstances. For example, in the case of financial predation lower prices may have exclusionary effects if lenders cannot distinguish whether reduced revenues are due to predation or mismanagement by the prey.

In summary, to distinguish predation from normal competition we therefore propose that evidence of actual profit sacrifice must be complemented with evidence of likely exclusion and likely recoupment. These three elements are necessary conditions for the conduct in question to be predatory, and neither by itself is sufficient for condemnation. However, taken together they are sufficient to establish a presumption of predatory conduct²⁹.

The competition agency should attempt to step-in as early as possible, and if possible at the "sacrifice" stage. Inevitably, the assessment in this latter case must be forward looking. One must still articulate all three elements in the context of an empirically plausible theory of harm. But as regards exclusion and recoupment a "more likely than not" standard appears most reasonable.

²⁷ The model of Bagwell et al. (1997) is relevant to retail industries where firms sell many products. In this case consumers have only imperfect information about current prices. There are just too many products. In this model, firms also invest in cost-reducing selling technologies. The larger the firms are, the greater their incentive to invest in selling technologies as the cost reduction applies to a large volume of sales. The model has three stages. In the first stage, identical firms enter the market. In the second stage, the competitive stage, firms select prices and investment levels. At this stage, firms differentiate themselves. Some firms price low in that stage to earn a "low pricing" reputation, and this will attract more consumers in the future. Other firms just want to reap short-term profit by pricing high. The firms that set the lowest price stand to gain the largest market share in the future. Because low prices would translate in greater sales volumes, these firms also invest more than the high price firm. The low price strategy in the context of imperfect price information is to convey the message to consumers that the firm is making large investments in cost reduction. In the last stage, the mature stage, firms only select prices, and high-cost firms lose substantial market shares or exit, while low-cost firms come to dominate the market thanks to their low price reputation.

²⁸ Bagwell et al. note that a strict application of the price-cost rules à la Areeda and Turner would condemn the market leader in particular when rivalry is the sharpest (as prices are likely to be below costs in this situation) and the benefit to consumers would be the greatest, as investment in cost-reducing technologies would be the greatest.

²⁹ This approach is similar to that taken by the US Supreme Court in its 1993 decision on the Brooke case. The Court required proof of three elements: (1) sufficient market power to have the requisite anticompetitive effect in the market where the predatory pricing is occurring, and (2) a sufficient likelihood of recouping the investment in below-cost prices after rivals were eliminated or disciplined and (3) proof that the defendant priced below some measure of costs. The Supreme Court did not resolve which measure of costs is relevant. The basic difference with our approach is that we allow for a finding of profit sacrifice, which does not rely, strictly speaking, on price-cost comparisons. This reduces the emphasis on estimating costs, which is complex and notoriously controversial, placing more weight on indirect evidence of profit sacrifice. Furthermore, it allows for a more comprehensive treatment of all predatory practices in general, including non-price predation.

4.1.2 ASSESSING PROFIT SACRIFICE LAST

In implementing the proposed structured rule of reason, we suggest to assess profit sacrifice last. This is because identifying in general profit sacrifice tends to be time-consuming. In practice, it is often not straightforward to determine the incremental cost associated with the predatory conduct. Normally, the firm whose conduct is being investigated has a large number of different cost items, and determining what extra costs are incurred by the predator involved a lengthy and tedious analysis. Further, in certain industries including airlines, firms set a complex array of prices instead of a single price. Carrying out the profit sacrifice step requires an in-depth inquiry of the predator's costs and revenues.

In contrast, it may turn out easier to determine whether market structure, demand characteristics, conditions of entry and exit are conducive to successful predation based on one or more relevant economic models of predation as a rational profit-maximizing strategy. If exclusion were unlikely, because the potential prey has no disadvantage relative to the predator and exit costs are significant, then predation would not succeed. If recoupment is implausible, e.g. because re-entry is costless, that casts doubt on any theory of rational predatory sacrifice. In other words, the feasibility and rationality of predation in the relevant market should be examined prior to testing for the presence of profit sacrifice³⁰. At the same time complainants must bring a convincing story as to why they will be obliged to exit, rather than a claim that prices are apparently "below-cost". Such claims are easy to make but difficult for a competition agency to prove (or disprove).

This approach should reduce false positives and save on scarce enforcement resources. If predation is unlikely to eliminate or deter rivals, or the predator cannot recoup its initial sacrifice, then a competition agency can dismiss allegations of predatory conduct without having to carry out an intricate assessment of actual profit sacrifice.

4.1.3 A SLIDING SCALE

The evidentiary standard for actual profit sacrifice should be less demanding when proof of the predatory scheme rests on a coherent theory of rational predation supported by actual evidence of exclusion and market structure conducive to recoupment post-exclusion. This amounts to a sliding-scale approach to proof of sacrifice.

Suppose, for example, the competition agency articulates a coherent theory of strategic predatory pricing based on modern economic analysis, that the prey has been excluded from one or more markets and that the evidence shows that post-exclusion market structure and competitive conditions allow for recoupment. With this evidence at hand, it should not be necessary to determine exactly whether incremental revenues are below incremental costs, or by how much and for how long. Instead, evidence that absent exclusionary effects the defendant would have been able to make more profits by following some other plausible course of action (e.g. pricing somewhat higher) would be sufficient in this case to raise objections of predatory behavior³¹.

However, when the evidence supporting the predatory theory appears weaker, though the theory of harm is more likely than not (i.e. both exclusion and recoupment are more likely than not) more detail is

³⁰ Unprofitable predation could well be harmful, but it may not be likely.

³¹ The sliding-scale approach is an important element in our framework for evaluating claims of predation. Precedent exists in the reverse sense: in predatory pricing cases, the quantum of intent evidence required to prove a violation increases as price rises above average variable cost (AVC) and approaches average total cost (ATC), and decreases as price approaches the lower cost level.

required in the proof of actual sacrifice. That is, in practice, it will be imperative to show using data on cost and revenue that incremental revenues do not cover incremental costs during the profit sacrifice phase.

4.1.4 UNOBSERVABLE ELEMENTS

An often heard complain is that predation theories depend on factual assumptions that are not observable. In general, the opposite is the case. For example, when predation depends on the prey being financially constrained, the extent of the prey's dependence on external financing and the resulting dependence of such financing on the prey's initial performance can be objectively determined with reference to financial accounts and internal documents.

Note also that financial market predation, requires no assumption of superior information by the predator. The only necessary assumption is that lending markets cannot feasibly make loans contingent on distinguishing whether the debtor's losses stem from predation or from agency costs. Neither does test market predation require an information asymmetry. It suffices simply to "jam" market signals so that the prey is unable to estimate demand and becomes less willing to risk entry.

Reputation building and cost-signaling theories of predation are based on the existence of some informational asymmetries between the prey and the predator. Reputation effects requires that the prey knows less than the predator about the predator's strategy, and cost-signaling requires a similar asymmetry in the prey's knowledge of the predator's costs. Such asymmetries may be difficult to prove directly. However, a competition agency can rely on circumstantial evidence and inferences derived past conduct.

4.1.5 BEWARE OF ABUSING THE CONCEPT OF DOMINANCE

In the context of Article 102, a pre-condition for finding predatory prices consists of establishing the dominant position of the predator on the market where the predatory prices are occurring. It has been argued then that recoupment is in fact taken into account indirectly in the showing that the predator is dominant. The assessment of dominance necessarily calls for an analysis of entry and re-entry barriers so a separate recoupment condition is not adding anything new³². This view is mistaken. Even if they have common elements, assessing the possibilities of recoupment does not replicate the assessment of dominance. As a result, dominance is neither sufficient for recoupment, nor, more strikingly, is it necessary.

A successful predator need not enjoy dominance in the market in which it sacrifices profits. A reputation for toughness in the face of competition, earned through predatory behavior in one market, can spill over to other markets where the predator faces potential competitive threats. Predatory pricing in a small market minimizes the profit sacrifice. However, competitors may be deterred or delayed to entry or expand in larger markets where the predator operates. The elimination of the competitive threats allows the predator to raise prices in these larger markets.

³² Proponents of this view often argue that if dominance is not sufficient for recoupment one could allow defendants a "recoupment defense". That is, a defendant can rebut the presumption dominance implies likely recoupment. This approach is rather disingenuous. First, it shifts the burden proof regarding the competitive effects of predation from the competition agency to the firm. Namely, the agency must only show there was sacrifice but the firm must prove recoupment was unlikely. Second defendants will always prefer to rebut the dominance finding itself rather than the presumption that dominance leads to recoupment. Except in extraordinary circumstances, we would not expect a defendant to accept a finding that it is dominant. Thirdly, much of the information needed to assess the post-predation market structure such as the likely response of non-excluded rivals, potential entrants and customers, is more easily available to the competition agency. Without access to such information, it is unlikely that the defendant can build a defense by proving the impossibility of recoupment - precisely when it is innocent.

Somewhat ironically, the most famous predatory pricing case in the EU is a good example of predation in one market to deter entry into a larger one - AKZO Chemie BV v Commission (Case 62/86). The allegation in this case was that AKZO was attempting to limit the expansion of a competitor, ECS, into the European plastics market. AKZO held a "dominant" position in this market that might have been significantly eroded by the expansion of ECS. However, AKZO's alleged predatory conduct was not targeted in this market, but rather at the activities of ECS in the UK market for flour additives, a relatively small sub-market within the wider European market for organic peroxides. In fact, if the EU market for plastics was large enough and ECS and AKZO were close competitors the incentive to predate might have also existed even if AKZO had not been dominant in the larger market.

Note also that dominance is not sufficient for recoupment. Recoupment depends on whether the potential gains after exclusion more than offset the initial profit sacrifice. These potential gains derive from the difference in market power the predator enjoys after rivals are excluded. Recoupment is therefore likely if predation leads to a significant increase in market power. But, recoupment is not systematically related to dominance, which measures the level of market power of the predator before or during the predatory attack. Market conditions after predation are generally different to market conditions before predation. The market structure is not the same as rivals exit the market or potential entrants stay out. Consequently, an assessment of dominance during prior or during the predatory attack is a priori unreliable for gauging the ability of the predator to exercise increased market power post-exclusion.

To assess the possibility of recoupment a competition agency must first determine the extent to which the predator exercise of market power will increase after the prey's exclusion. This depends on the extent of the competitive constraint the prey exerted on the predator. For example, if the prey offered close substitutes its exclusion is likely to allow the predator to increase prices significantly. None of this is taken into account in the assessment of dominance before the recoupment phase.

Recoupment depends also on the actual sacrifice level needed to induce exclusion. If to be successful a predatory strategy requires substantial losses, then the recoupment will also need to be substantial. Again, dominance offers little indication as the extent of the profit sacrifice required to induce exclusion.

In addition, there is at least one well-identified situation for which dominance is poorly related to recoupment possibilities. As McGee (1958) argued, a firm leaving the market may recover some of its investments by selling out its assets to another rival or a potential entrant. The assets stay in the market, making it difficult for the predator to increase prices to recoup its losses. In this case, evidence of dominance will not provide little indication as to the possibility of recoupment.

4.2 THE ASSESSMENT OF DOMINANCE IN PREDATION CASES

In practice, when investigating a breach of Article 82, the competition authority determines dominance at the time when the abuse occurs. However, for predation to harm competition, it does not require that the predator has significant market power. To predate successfully, all a predator needs is some inherent advantage over its prey, and the ability to lower the market price which requires sufficient excess capacity to flood the market and serve the increased demand.

In comparison, it may be very costly for a firm that is dominant before the predation phase to actually predate. Firms with large market shares would suffer considerable losses at the sacrifice stage, as low prices will extend over a large sales volume. Moreover, the presence of a dominant firm indicates that the degree of competition is already weakened. As a result, a dominant firm may earn limited gains from further increasing its grip on the market relative to a firm that predares in the hope of acquiring a dominant position.

There is no economic justification for making ex-ante dominance a requirement for predation under Article 82. If a firm predates and thereby acquires dominance, it will increase prices during the recoupment phase. This generally leads to consumer harm. Such conduct is abusive because the price increase derives from a dominant position acquired by illegitimate or anti-competitive means, but not by competing on the merits³³.

A popular argument is that the requirement to show ex-ante dominance serves as a safe harbor. Alas, at best, it is a poor one. To be effective a safe harbor must have two properties. First, it must be simple to implement. In practice, it is difficult to assess whether a firm is dominant in the sense that it exerts substantial market power. Except in extreme cases (when market power is very high, or when it is non-existent) the assessment of dominance will always be controversial. Mostly this is because a substantial level of market power does not define a clear threshold for dominance. Moreover, the assessment of dominance is also sensitive to market definition, in particular given the relevance of market shares in the European case law.

Second, a safe-harbor must be a good proxy for the absence of competitive harm. In predation cases, ex-ante dominance also fails this criterion³⁴. Successful predatory conduct to acquire dominance is likely to be equally, if not more harmful to competition and consumers than predatory conduct by a dominant firm. A dominant firm may predate to deter future entry but its incentive to predate to further extend its dominance may not be as high as a firm that seeks to acquire a dominant position. The price increase resulting from the creation of a dominant position can be significant.

4.3 AN EFFICIENCIES DEFENSE

We suggest that profit sacrifice, likely exclusion and likely recoupment are necessary and taken together sufficient to establish a presumption of predation. And these three elements should be enough to raise objections. The defendant may rebut such presumption by showing that its conduct is desirable despite its exclusionary effects and likely, on balance, to increase consumer welfare. Nevertheless, the burden of rebuttal falls squarely on the defendant.

European Courts have not given any support to the relevance and scope of an efficiencies defense with respect to predatory conduct. According to the Court of Justice, any business justification for below-cost pricing is only available to the extent that prices are above variable costs³⁵. However, the actual policy of per-se prohibition of below-cost pricing could impede and further chill welfare-enhancing behavior. This is for at least three reasons.

³³ In the United States, the prohibition on attempts to monopolize a market under section 2 of the Sherman Act opens the door to allegations of predation by a firm without a substantial degree of market power.

³⁴ Dominance may be necessary to engage in exclusionary practices that raise rivals costs, e.g. in refusal to deal cases. In general, a firm without significant market power upstream may not be able to raise the costs of its downstream rivals. With respect to such exclusionary practices, dominance (or its absence) may be closely related to both the likelihood and the degree of competitive harm.

³⁵ In AKZO the Court stated: "Prices below average variable cost (that is to say, those which vary depending on the quantities produced) by means of which a dominant undertaking seeks to eliminate a competitor must be regarded as abusive. A dominant undertaking has no interest in applying such prices except that of eliminating competitors so as to enable it subsequently to raise its prices by taking advantage of its monopolistic position" and in Tetra Pak II, the Court also held: "Prices below average variable costs must always be considered abusive. In such a case, there is no conceivable economic purpose other than the elimination of a competitor, since each item, produced and sold entails a loss for the undertaking."

4.3.1 EFFICIENCIES-ENHANCING INVESTMENTS AND PROFIT SACRIFICE

It is uncontroversial that both desirable and undesirable practices may involve profit sacrifice³⁶. Investments in fixed assets, process innovation or new product development would generally be justified irrespective of whether or not rivals are forced to exit the market. For example, to obtain a patent, investments would typically be unprofitable but for the prospect of later monopoly returns reaped by (lawfully) excluding competitors. Again, such instances are unlikely to be mischaracterized as predation under the three-step structured rule of reason we propose. Identifying “likely exclusion” requires an assessment of the reasons why the alleged prey would exit the market in reference to a valid theory of rational predation. For instance, extraordinary investments in R&D by a dominant rival could be deemed predatory if all its rivals are severely constrained financially, and the predator is well aware of this fact which triggers additional investments than otherwise. Yet an incumbent that invests heavily and wins a patent race against one or more financially healthy rivals is competing for the market, not predating.

4.3.2 REACTION TO CHANGES IN MARKET CONDITIONS

Low prices or other forms of apparent aggressive behavior may be a response to market events outside the firm's control, seeking to maintain its competitive position in the market. There are circumstances where pricing below cost is an attempt to minimize losses stemming from unexpected market developments, such as excess capacity, product obsolescence, or shrinking demand.

For example, if an industry has an unsustainable number of firms so that one or more firms will ultimately be forced to exit in the medium to long term, and if the firms do not know their rivals' costs, prices might fall below cost as the firms struggle to survive until one firm exits. Short-term losses can then be recovered by the surviving firms after industry rationalization.

In some markets, large-scale entry can reduce each incumbent's share of demand rapidly, thereby creating excess capacity and leading to the same situation as an industry downturn. In other industries consumer demand is cyclical, and firms may need to sell below cost during the slumps to maintain customer relationships, avoid shutdown and re-start costs, and/or storage costs.

Low pricing in any of these circumstances benefits consumers in the short run and may promote long run consumer and social welfare in cases where it preserves the price cutter as a competitor or potential competitor in the challenged market.

4.3.3 MARKET EXPANDING EFFICIENCIES

Low pricing may be justified by market expanding dynamic efficiencies. A firm may price below its costs to promote a new product or enter a new market, entice consumers to shop at an existing outlet, reduce costs through learning-by-doing, or increase the value of its product through network externalities.

Such dynamic efficiencies explain how the higher sales resulting from lower prices might increase future profits even with no exclusionary or disciplining effect. Evaluation of market expanding efficiencies may raise difficult issues of characterization as they also involve recoupment, but in this case it comes not from output contracting monopoly pricing, but from output expanding efficiencies.

³⁶ Elhauge (2003) questions the merits of requiring sacrifice as a constitutive element of predatory conduct. He points out that several forms of desirable market activity involve profit sacrifice. Indeed, every investment - including investments in building new facilities, training personnel, or making organizational or distributional changes - involves some sort of initial sacrifice, which pays off only if the firm succeeds in the marketplace.

The mere presence of these efficiencies does not preclude a coexisting predatory strategy to exclude or discipline rivals. In one scenario, the exclusionary impact of lower prices and the resulting increase in market power for the predator may be present but insufficient, in itself, to justify the initial profit sacrifice. However, it is possible that a firm will predate if the additional gains that result from market expansion together with the increased market power, compensate for the initial sacrifice. In another scenario, by exercising increased market power after exclusion the predator can entirely recoup its initial investment. Hence, there is predation. However, efficiency gains from learning curve or network effects could be substantial. The resulting incentive to reduce prices could more than offset the incentive to increase them after rivals are excluded. Thus predation could, on balance, benefit consumers in the same way a merger to monopoly can reduce prices if it leads to significant marginal cost reductions. In these situations, the competition agency should not intervene to avoid the risk of false negatives.

In general, the burden of establishing a legitimate business justification should fall on the alleged predator. To make its case, the firm will need to show that it was pricing below cost for legitimate, non-predatory reasons. It must be able to support the conclusion that it would have set the same prices even if doing so had not harmed competition. Specifically, the company should have to show either that circumstances forced it to price below cost, or that its prices were part of a normal business practice involving a brief period of losses.

In practice, to identify the presence of efficiencies, Bolton et al (2001) proposes a neat structure that requires that the efficiency gains be plausible, there was no less restrictive alternative to achieve these gains and that the recoupment stems only from efficiency-enhancing factors.

4.4 OTHER STRUCTURED RULES OF REASON

Other economists have suggested that predatory pricing or more generally predation should be assessed using a less formal approach than the price-cost rules. When Scherer (1976) criticized Areeda and Turner (1975), although he did not formulate specifically how to assess predatory pricing, he clearly expressed a preference for an effect-based approach. Many economists followed suit.

To date, Joskow and Klevorick (1979) were the first to advocate a rule of reason designed as a two-tier system. The first tier consists in an assessment of whether market structure is conducive to predation. This entails evaluating the existence of monopoly power and the condition of entry. In the second tier the alleged predator's actual pricing behavior is examined. However, the center piece of the second tier is the use of price-cost tests which remains formalistic. Joskow and Klevorick also departed from Areeda and Turner by advocating the average total cost as the primary cost standard for predation. The method advocated by Joskow and Klevorick bears resemblance to the current EU legal standard, which involves first an assessment of firm dominance and second the implementation of price-cost comparisons.

As far as we know, Bolton et al. (2000) were the first to propose a structured rule of reason incorporating modern economic theories of predation. Their proposal attempts to incorporate the modern theories of predation into the U.S. legal standard, in particular it is consistent with the U.S. Supreme Court legal standard developed in *Brooke Group*. Their proposal consists of assessing predatory pricing by requiring the showing of five elements: (i) a facilitating market structure; (ii) a scheme of predation and supporting evidence; (iii) probable recoupment; (iv) price below-cost; (v) the absence of an efficiencies or business justification defense.

In Europe, the AKZO's standard has not led the EC Commission to include modern economics into the assessment of predatory pricing. A recent decision by the Irish Competition Authority, however, shows that a structured rule of reason that include modern economic theories of predation can be applied within the framework of article 82. In its decision *Drogheda Independent*, the Irish Authority

concluded that the alleged predator was not dominant, but regardless of that assessment it also determined that the alleged predation “would appear to be highly implausible”. In the decision the Competition Authority set out the following structured rule of reason³⁷. Once the alleged predator’s dominance has been established, the authority determines four distinct elements: (i) whether the alleged predatory behavior is plausible; (ii) whether there could be a plausible business justification for the alleged predatory activities; (iii) whether recoupment was feasible; (iv) finally whether prices were set below cost.

Our own proposal bears strong similarities with that of Bolton et al. (2000) and that of the Irish Competition Authority. We diverge from these proposals on several aspects. First and foremost, we do not endorse the traditional price cost comparison as the sole means to demonstrate profit sacrifice. In fact, these comparisons tend to generate very conservative estimates of actual profit sacrifice. As a result, these other rules of reason augment the current legal standard without altering the existing requirement for showing profit sacrifice. In our view a switch to a rule of reason that also requires showing likely exclusion and likely recoupment should require more flexibility for showing profit sacrifice.

The price-cost rules were designed to limit the number of successful litigation based on predatory claims. Although, such legal standard was possibly necessary to limit frivolous complaints from weaker competitors at that time they were adopted, nowadays modern economics provide a set of tools that enable competition authorities and judges to assess more accurately predatory claims than ever before. Second, comparing the incremental costs with the incremental revenues associated with the predatory conduct is technically more accurate to demonstrate the existence of actual profit sacrifice. Finally, in cases where strong evidence of exclusionary effect and recoupment are present, we would consider that evidence of profit sacrifice be not necessarily based on a detailed examination of the dominant firm’s costs and revenues. In the next section we provide a more detail discussion of the three-step rule of reason we advocate.

5 A THREE-STEP RULE OF REASON UNDER ARTICLE 102

In this section we discuss in more detail each of the three steps of this rule of reason. In particular, we provide some general guidance in relation to the type of evidence that need to be brought to the fore.

5.1 LIKELY EXCLUSION

A predatory strategy has the sole purpose of: (i) inducing exit; (ii) deterring entry into the predated market or other markets; (iii) lowering the cost of acquiring a competitor; (iv) or ‘disciplining’ rivals into permanently accepting relatively small market shares or collusive pricing.

To prove these exclusionary effects, a competition agency should rely on a well-articulated theory of rational predation. The aim is to provide an explanation as to why the prey will prefer to exit rather than compete against the predator. The answer to this question requires an understanding of the extent and duration of the alleged predation, the relative financial strength of the predator relative to the prey and the victims’ expected profitability of staying in the market.

Evidence that predation failed in the past, for instance, because rivals were not excluded, is useful but not conclusive. Indeed a predatory strategy could be maintained despite several periods of failure. In each new period the probability of success may be updated downwards. But if the potential gains substantially exceed the costs the expected return of predating might still be positive.

³⁷ Decision of The Competition Authority (Case COM/05/03), 7th December 2004, concerning “the alleged predation by the Drogheda Independent Company Limited in the market for advertising in local newspapers in the greater Drogheda area.”

In section 2 we presented the main strands of the economics of predation. The actual theory of harm should rely on these models and not on simply observed low prices and likely recoupment possibilities. Bolton, Broadley and Riordan (2000, 2001) offer an exhaustive review of the relevant factors which a competition agency has to assess to establish whether an aggressive conduct could lead the prey exit or stay out of the market. They identify various subsets of observable factors one can rely on to proof the likely exclusion depending on the underlying mechanism of predation. We refer to their work.

To prove exclusion resulting from financial predation a competition agency must show that predation reduces the prey's initial performance sufficiently to threaten the prey's continued financing and viability. There must be evidence that the alleged prey depends on external financing. Also the prey's access to external financing must be shown to depend on its performance. Otherwise the prey and its investors and creditors would be insensitive to a predation strategy. Cash flow is an obvious performance indicator but there may be others depending on the industry. Because predation also reduces its own profits the predator must be able to absorb initial loses by relying on internal sources of financing or a better access to external credit than the prey³⁸.

Predation to eliminate a financially constrained rival and predation to acquire a reputation for aggressiveness are closely related. There are reputation effects if predator reduces price in one market to induce the prey and potential entrants to believe the predator will cut price in other markets or in the predatory market at a later time. The incumbent seeks to establish a reputation as an overaggressive competitor, based on some perceived special advantage or characteristic. In these circumstances creditors may find it even riskier to continue to support a financially constrained firm.

In general, reputation effects are more credible in a multi-market context, as the market where the predatory attacks occurs is often the stage where the predator demonstrates its toughness. Basing a case only on the reputation effect of predation is not prudent however. As reputation is hardly tangible, the case might be impossible to demonstrate. The absence of new entry would help but by itself it is insufficient to confirm the existence of a deterring reputation (there also would be no new entry if the market were declining or stagnant). A strong case for the reputation hypothesis can be made if it is shown that even when the circumstances are quite favorable for significant new entry and rival firm expansion in the predator's market (e.g., rapid market growth and legally binding constraints on the dominant firm's expansion), little new entry actually occurred and the predator was able to delay its subsequent renewed expansion until it could well cover its costs. One should observe the predator itself expanding into other markets as conditions warrant, even though no other firms enter or expand in those markets. Finally, it must be shown that the potential entrant observes the exit or other adverse effect experienced by the predator's existing rival. Otherwise there can be no reputation effect.

To prove that an incumbent can deter entry by misleading the entrant into believing it has low costs there can be no transparency as to the cost structure of the incumbent. Further, cost-signaling is most plausible when the prey has reasons to believe the incumbent has recently reduced its variable costs, possibly in reaction to some exogenous, observable event. The possible cost reduction must be of sufficient magnitude to require the victim to exit or stay out. Low-cost signaling is a risky strategy to drive out an existing rival unless there are high re-entry barriers. If the predator attempts to recoup its losses by raising price after exclusion this risks revealing the signaling strategy to the prey and other potential entrants, causing them to upgrade their estimates of market profitability. In the absence of substantial entry and reentry barriers, rivals would then have an incentive to enter or reenter the market, preventing recoupment.

Proof of test market predation requires evidence that predatory conduct prevents a potential entrant from learning about demand under normal competitive conditions. First, it must be the case that price cutting by the predator must be secret, for otherwise the prey will not be misled into thinking that demand for its product is low. Second, it is often indicative of test market predation if the predator cut prices only in

³⁸ See Bolton et al., 2000 and 2001 for more details.

the test market, and not in other markets. Test market predation will not harm competition unless the victim is misled into believing that demand for its product is weak. Bolton et al. (2000) rightly point out that the standard should be measured not by whether the victim itself lacked knowledge of market demand, but by whether a "representative firm in the industry"—a rational firm—would be unable to assess demand. If other equally efficient information channels are available, such as market research or prospective customers, then a representative firm in the industry would not be confused, and a test-market jamming strategy would be implausible. Thus, there must be evidence that alternative information channels were unavailable, significantly more costly, or less accurate.

Finally, unlike test market predation, to prove signal-jamming predation it is necessary to show that the initial sacrifice (i.e. price-cuts or other forms of predatory conduct) is public, since the purpose of the price cut is simply to obfuscate the test market results of the new entrant. Instead of being misled into believing that demand is weak, the victim may simply be unable to assess the demand for its product due to the signal jamming effect.

5.2 LIKELY RECOUPMENT

Proof of actual recoupment is not a necessary ingredient of predation only a showing of probable recoupment should be required. This requires evidence that market conditions and the predator's conduct makes future recoupment likely causing prices to rise. Note that recoupment need not be confined to the market in which predatory behavior occurs. A firm can raise barriers to entry to a market by developing a reputation for predatory conduct, either in that market or in other markets.

Before examining the various factors that should be taken into account in this step, it is important to note that recoupment differs according to whether the predatory attack is directed against an existing competitor or against an entrant or potential entrant. In the former case, the target is a competitor who has been exercising a downward influence on the predator's price. A successful predatory attack will allow the predator to raise its price above the pre-predation level, and this will permit the dominant firm to recover its losses. It follows that consumers will be worse off in the recoupment period than in the pre-predation period.

In the case of predation against an entrant or potential entrant, the predator lowers its price in order to make entry appear unviable so that the recent entrant exits or the potential entrant stays out. If that strategy succeeds, the predator will then raise its price back to the pre-predation level. In all likelihood, it would not try to raise it above that level. If it could do so profitably, it would have done so already before the entrant appeared. Thus, in this case, recoupment is not achieved through an ability to raise prices above pre-predation level to reap more profits than before, but through the restoration or entrenchment of a position, that maintains the previous level of supra-competitive profits. It follows that consumers are worse off because prices are higher than they would have been had the predatory attack failed and the entrant competed with the predator.

The assessment of the probable recoupment will take into account a variety of structural conditions that contribute to the likelihood that a predatory pricing strategy will be successful.

5.2.1 ENTRY IS UNLIKELY AFTER THE PREY IS EXCLUDED OR DISCIPLINED

The presence of entry barriers after exclusion is essential if a predator is to have any hope of recovering losses it incurs at the sacrifice stage. Once it drives competitors out the predator needs to raise its price high enough to earn the supra-competitive profits that justify its initial sacrifice. Ordinarily, those profits would attract entrants, driving prices down. If prices fall back to pre-predation levels—when its pricing policy is constrained by the presence of competitors--then the sacrifice would not pay-off and predation is irrational.

In principle, assessing predation at the recoupment stage (i.e. post-exclusion) is easier than at the sacrifice stage (pre-exclusion). At the recoupment stage, it may be possible to observe whether the predator enjoys increased market power relative to the scenario without predation. In contrast, to assess the prospect of recoupment at the sacrifice stage a competition agency must rely on estimates regarding future events and market conditions. However, this is no impossible obstacle. The assessment of likely recoupment bears similarities with the analysis of merger-induced entry in merger cases. A merger eliminates the competition constraint that the merging parties impose on each other and reduce the intensity of competition, increasing market concentration. As a result, a merger may increase the expected profitability of entry. Similarly, by inducing exit or deterring entry, predatory conduct has an impact on market structure.

Establishing likely recoupment at the sacrifice stage is a forward looking assessment of entry prospects after exclusion. For recoupment to be probable, entry must be shown to be unlikely, insufficient or belated. In merger control entry likelihood analysis asks whether an entry plan would be profitable to carry out in the post-merger environment. Similarly in predation cases, likely recoupment depends on whether entry is likely post-exclusion. Entry can be profitable at pre-exclusion prices even if it was not profitable before the prey left the market. If the predatory strategy is successful, at the recoupment stage market output will decline, thereby creating additional potential sales for an entrant beyond what had previously been available. Entry is then more attractive than it had previously been. When considering the likelihood of entry after exclusion, competition agencies must also pay attention to the time necessary to accomplish it.

Sunk costs matter in the assessment of barriers to entry. The presence of high sunk costs would indicate that recoupment is likely as entry is highly risky. However, when recoupment is assessed at the profit sacrifice stage without the benefit of observing the post-exclusion period, a forward looking assessment of predation might prove difficult. The presence of high sunk costs would also make it more difficult to drive existing rivals out the market. Indeed, these irreversible investments make it more costly for the prey to exit the market. This element must therefore be taken into account in the assessment of likely exclusion³⁹.

Finally, whether assessing predation at the sacrifice or at the recoupment stage historical evidence on entry should be analysed with care to ensure that it is probative. First, evidence of no significant entry can mean the market is competitive since large-scale entry does not happen because it is unattractive, with prices down around costs. Conversely, the fact that entry has occurred in the past does not imply there are no barriers to entry or that entry is necessarily easy. In general, a clear signal of low barriers is provided only by effective, viable entry that takes a nontrivial market share.

5.2.2 RE-ENTRY IS UNLIKELY

Re-entry barriers are equally important when assessing likely recoupment. A re-entry barrier may be defined as the cost that a firm that has exited a market must incur to resume production. If the firm can costlessly re-assemble the physical and human capital dispersed upon exit, then no re-entry barriers exist. In this case, a predator is unlikely to recoup the lost profits because its rivals remain viable even after they cease production. Hence, there can be no motive for predation.

Re-entry barriers exist, for example, when it is difficult and expensive for a firm that has left the market to repair the damage done to its reputation when it exited. Alternatively, it may be difficult for some firms to rehire the specialists who lost their jobs when the firm went out of business, or to find new ones to replace them.

³⁹ Cabral and Ross (2008) develop a model where sunk costs serve the entrant to commit to stay on the market which softens the reaction of the incumbent.

5.2.3 ASSESSMENT OF THE COMPETITIVE CONSTRAINED EXERCISED BY THE EXCLUDED RIVAL

The possibilities to recoup an initial sacrifice will depend on the identity of the prey. Suppose the prey is relatively efficient, produces a close substitute to the predator's product, is a potential entrant on various markets on which the predator is established, or a maverick whose presence impedes coordinated behavior with other rivals. It is likely that the exclusion of such rival will significantly increase the predator's market power. And this greatly facilitates the possibilities of recoupment. Again, such assessment bears similarities with the analysis of competitive effects in horizontal mergers where the emphasis is on the extent to which the merging parties were close competitors pre-merger.

5.3 ACTUAL PROFIT SACRIFICE CONDITION

In the absence of evidence of actual profit sacrifice, predation can simply not be established. Even if the conditions for exclusion and recoupment are present, a firm may prefer not to engage in predatory conduct, particularly if it fears the wrath of effective antitrust law enforcement.

In theory, a predator will sacrifice profits when its marginal cost exceeds its marginal revenue. In this case, the last unit of output costs more to produce than the revenues it generates once sold. The firm would thus be better off not producing the extra unit. In practice, however, marginal costs and marginal revenues are notoriously difficult to measure. It would also be elusive to calculate the profit-maximizing price or output level to compare with the actual output and price level. Instead, to show actual sacrifice we propose to follow two different approaches.

5.3.1 COMPARING INCREMENTAL REVENUES WITH INCREMENTAL COSTS

The most direct way to test for a temporary profit sacrifice is to compare the incremental costs and revenues of the alleged predatory practice. That is, does the conduct of the firm actually generate more revenues than the costs incurred? If the incremental costs of expanding output or increasing quality is higher than the associated incremental revenues clearly this provides immediate evidence of profit sacrifice.

This approach is sufficiently flexible to be applicable also in non-price predation cases, simplifying the sacrifice inquiry relative to traditional price-cost tests. For example, following entry of a threatening rival a dominant firm may ramp up its advertising campaign to a point beyond what a normal competitive response would be. In fact, the firm is sacrificing profits because the extra revenues generated by that extra advertising are less than what it costs. And when the predatory behavior includes a myriad of actions such as lower prices, large advertising campaign, extra-service etc...directed at attracting additional customers, the combined incremental revenues of all these activities can be compared with the incremental costs.

Under this approach competition agencies should limit feckless debates over the relevant cost measure with the parties. In particular, the competition agencies do not have to make complex judgment calls about which costs should be considered variable or fixed. In addition, the issue of allocating common costs should not arise as only incremental costs are concerned. When the firm offers steep discounts or adopts other form of non-linear pricing, it may be more accurate to compute the per-unit incremental revenues rather than using the market-wide per-unit price.

The apparent difficulty with this approach, however, may be to determine exactly when the alleged predatory practice begins. But usually alleged predatory practices are marked by a departure from the normal conduct that provides a natural anchor to compute incremental costs and revenues. In case of dispute, sensitivity analysis can be conducted in computing incremental revenues and incremental costs.

5.3.2 OTHER, MORE PROFITABLE ACTIONS

In some cases, it might prove tedious and time consuming to gather sufficient data to determine whether incremental costs are above incremental revenues. Yet, in principle, it is still possible to establish sacrifice. The competition agency can show that an alternative course of action for the firm exists that would have led to greater profits. However, unlike the first approach described above, this exercise relies on comparing profit under predation (observable) and profit under accommodation (not directly observable). This type of evidence can be very persuasive as long as they are the result of a careful empirical analysis. The EC Commission Guidance on Article 102 paper adopts this possible alternative way of showing profit sacrifice⁴⁰.

Importantly, we are not suggesting that a competition agency second-guess what alternatives firms could have opted for. For example, an incumbent airline may respond to entry by a financially constrained firm by doubling the number of flights on that particular route. In contrast, on other routes where entrants are not financially constrained the incumbent responds by reducing (or not significantly increasing) the frequency of its service (see Section 6 for a discussion of the American Airlines case). In this situation, it could be convincingly argued that the response to entry in the first route involves profit sacrifice, in comparison with the response to entry in "normal" circumstances (i.e. when predation is unlikely to succeed because entrants have deep pockets). Such analysis must be born out by actual data, not mere speculation⁴¹.

When assessing alternative actions, one must avoid three common pitfalls. First, as already discussed profit sacrifice refers to avoiding a more profitable course of action, but not the most profitable. Second, sacrifice must be assessed with reference to a hypothetical response in an environment where there is no exclusion and rivals compete. There is no sacrifice even if a more profitable response to entry might well be to set a duopoly price in tacit collusion with the entrant. Third, entry ordinarily reduces an incumbent's profits even if the incumbent responds optimally. That profit reduction must not be confused with sacrifice. That is, the relevant counterfactual must also consider likely entry if it is expected to take place independently of predation.

This alternative route to show actual profit sacrifice should be used when there is strong evidence regarding likely (or actual) exclusion and likely (or actual) recoupment. This reflects our view that there should be a sliding scale as regards the standard of proof of actual sacrifice. The more convincing the evidence on the first two conditions the less detailed the required analysis to establish sacrifice.

5.3.3 USING PRICE-COST RULES AS AN ALTERNATIVE

Traditional price cost comparisons offer only a conservative approximation of profit sacrifice. This implies that when prices are found below these measures of cost, there is strong evidence that the firm has lost profit. However, a firm may sacrifice profit and yet prices may be found above the traditional measures of costs described in AKZO. There are a number of reasons why applying the AKZO rules favors the dominant firm, and this is because price and average variable costs are only approximation for testing profit sacrifice.

First, price is not equal to marginal revenue except for firms that have no market power. From microeconomic principle, any profit maximizing firm with market power sets price above marginal revenue. As a result, using price instead of marginal revenue provides only a conservative estimate of profit sacrifice. The firm could lower price so that marginal revenue is less than marginal cost, yet price remains above marginal cost.

⁴⁰ See EC Guidance on the Commission's Enforcement Priorities in Applying Article 82 EC Treaty to Abusive Exclusionary Conduct by Dominant Undertakings, paragraph 64.

⁴¹ See Edlin and Farrell (2002) for a discussion.

Second, average variable cost can be a poor proxy for marginal cost. When the marginal cost curve is increasing with output, as the predator expands output marginal cost is higher than average variable cost. Comparing price with average variable cost during the predation phase is again favorable to the predator. Prices might be above average variable cost and yet they are below marginal cost.

Finally, in practice the price and average cost are often computed as market-wide measures but not as incremental metrics. Comparing average revenues with some average cost benchmark in the market can then be a poor test to determine whether the incremental profits associated with an alleged predatory practice are negative or positive. First, the predator, facing a demand curve that is downward sloping, will tend to earn less on incremental sales, the predatory sales. As a result, the average revenue will be greater than (average) incremental revenues. Second, if costs increase with output, incremental costs would be higher than average costs. In sum, the use of market-wide average measure tends to mask profit sacrifice.

The EC Guidance paper on Article 82 EC Treaty is using pricing below average avoidable cost as indication of profit sacrifice. The switch to average avoidable cost (AAC) is welcome. First, this will avoid endless dispute about the definition of variable vs. fixed costs. Second, as made clear in the Guidance paper, it should be computed over the incremental predatory quantity⁴². However, in practice this test is not immune from some of the criticism we have just discussed, and might remain distant from actually comparing incremental revenues and costs. In particular, the AAC can be lower than the average incremental costs, and as such bias the sacrifice test in favor of the dominant firm. This is because the average incremental cost will account for all costs, including sunk costs, incurred in producing the extra predatory output, whereas the AAC measure will exclude these sunk costs as those cannot be avoided⁴³.

6 AN ILLUSTRATION: THE AMERICAN AIRLINES CASE

In 1999, the US Department of Justice (DOJ) sued American Airlines for alleged predatory behavior on routes out of its hub in Dallas – Fort Worth Airport (DFW) from 1995 to 1997. The District Court granted summary judgment in favor of American in 2001, and in appeal, the U.S. Court of Appeal of the Tenth Circuit upheld the summary judgment in 2003. The judgments have since triggered a wave of comments. Using the facts and data provided in the Courts' judgments and various filings of DOJ we review the case in light of our approach to assess predation⁴⁴. Of course, such an exercise is plainly academic and its only purpose is to illustrate the three-step methodology. We pretend neither to provide an expert opinion on this case nor to make any judgment on the arguments offered by the parties and the judges.

DOJ claimed that American engaged in predatory behavior against three low cost carriers (LCCs), Vanguard Airlines, Sun Jet and Western Pacific. DOJ maintained that American engaged in such an exclusionary conduct to protect its hub dominance at DFW. Prior to these episodes of predation, another LCC, ValueJet, had succeeded in establishing a base of operation in Atlanta, the hub of Delta Airlines, another network carrier. Delta accommodating strategy resulted in a significant loss of market shares and revenues. According to DOJ, such experience convinced American that it had to be overly aggressive against LCCs to avoid the same fate at DFW.

One important aspect of this case is that DOJ did not challenge American's conduct as *stricto sensu* predatory pricing (see Werden, 2003). In fact, American's fares were never below those of its rivals. The

⁴² See EC Guidance on the Commission's Enforcement Priorities in Applying Article 82 EC Treaty to Abusive Exclusionary Conduct by Dominant Undertakings, paragraph 25 and footnote 18.

⁴³ See Baumol (1996) for a discussion about the difference between AAC and AIC.

⁴⁴ Non-confidential versions of DOJ filings are available at <http://www.usdoj.gov/atr/cases/indx199.htm>.

alleged predatory conduct was the money-losing capacity addition. American responded to entry by LCCs by first matching the LCCs fares and then either by increasing the number of frequencies or using larger planes, or a combination of both. DOJ claimed that such conduct did not make sense economic but for preventing the LCCs to establish a hub at DFW⁴⁵.

6.1 EVIDENCE OF LIKELY EXCLUSION

Following our proposal, likely exclusion is assessed first. Under this header we attempt to establish whether American had adopted a predatory strategy that was likely to force the LCCs out of the markets. DOJ claimed that American was building its reputation of “predator” against any LCC whose ultimate goal was to establish a mini hub at DFW. Even though DOJ did not appear to rely on other modern economic theories of predation, there are some elements of financial predation scattered here and there the filings that suggest that a modern theory of “deep pocket” could have been developed.

6.1.1 FINANCIAL PREDATION?

First, the three LCCs were relying on external financing to launch and develop their operations while American Airlines had much “deeper pockets”. In general, experience in the airline industry has shown that new airlines, and in particular independent LCCs, tend to rely on external funds to develop their operation. Second, such reliance on external funds of newcomers is common knowledge. American Airlines, therefore, must have known that its preys had to turn to their debtors for additional funds. The LCCs could not possibly rely on a “war chest”. Third, generally a LCC’s entry strategy is split in several steps. The first stage consists of selecting one or two profitable routes out of a specific airport on which the LCC starts operating flights. Then if successful in the first stage, a LCC may ramp up its operation gradually by operating new routes out of the same airport. In terms of ground crew, maintenance and passenger service, an airline may reap significant economies of scope as it begins flying over many routes.

Because the predation episode occurred in the initial phase of entry, this also indicates that American was trying to damage the LCC’s initial performance. American did not wait until the LCCs were operating many routes out of DFW to act. As soon as the LCCs announced they would increase their activities out of DFW by operating more destinations, American added money-losing capacity on the few markets when these LCCs operated. Such actions would necessarily harm the initial performances of the LCCs, and if successful, cast doubts on the LCCs’ chances of success at DFW airport.

American’s strategy was successfully in gaining back many passengers, limiting the source of revenues of LCCs. There is also evidence that American monitored closely the performance of its preys, calculating their load factors and break-even point. Such activity indicates that American was trying to gauge whether its aggressive strategy was successfully triggering financial losses for its rivals.

It is also clear that American had sufficient internal funds to sustain a temporary price war against these LCCs on a few markets. The 10-K SEC filings during the years of the alleged predation reveal that AMR, the parent company, had tens of millions of dollars available. In addition, had it been necessary, the scope of American’s operation and its credentials with the financial markets at the time would facilitate the creation of new lines of credit.

Finally, it appears that American had opted for a different competitive strategy, depending on which rival it faces. Delta has been an active player out of DFW, and other network carriers fly regularly from their respective hub to DFW. American strategy against other large network carriers can be contrasted with the strategy it adopted against the three LCCs. In addition, and more telling was American strategy

⁴⁵ Brief for Appellant United States of America.

with respect to SouthWest a large LCC that operate out of Love Field, another airport in the Dallas-Forth Worth urban area. DOJ contrasted American's accommodating strategy when facing SouthWest, a more established LCC with substantially larger operation and greater financial backing than the three LCCs at issue in this suit.

Shortly after American started the alleged predatory episode, the three LCCs eventually exited the route and left DFW altogether. Two of them, Sun Jet and Western Pacific, filed for bankruptcy shortly thereafter, and Vanguard, the third one relocated in Kansas City.

6.1.2 BUILDING A REPUTATION FOR TOUGHNESS?

American operated flights on hundreds of market out of DFW, and the LCCs entered only a handful of them. American could use these few markets where it faced these newcomers to demonstrate its "toughness" and start building a reputation of an aggressive incumbent sending a clear signal to any LCC wishing to enter a route at DFW. Because the number of markets to protect is large, such strategy might be very effective when the profit sacrifice takes place on a handful of markets. In fact, this strategy against financially weak entrants that relied on external funding reinforced the reputation that American would be particularly aggressive when facing this particular type of entry. The strategy was made credible as American repeatedly attacked the weaker LCCs that tried to set foot at DFW during these two years. The streak of predatory episodes led DOJ to file suit against American. American was sending a clear signal to every potential LCC entrant.

DOJ alleged that American newly acquired reputation of tough competitor deterred other LCCs to enter routes to/from DFW. For example, the District Court reports that JetBlue, a LCC based in New York City, "believes that its proposed service of three-round trips a day between JFK and DFW would be financially viable so long as the competitive reaction was only fare matching by the incumbents and did not include adding flights". Potential entrants were clearly watching the event unraveling at DFW and few have since attempted to enter massively at DFW. The District Court noted that since 1995 several LCCs have entered DFW, but it does not appear that any one of them is serving more than two routes out of DFW. As of today the presence of LCC in DFW seem to be restricted to a few routes.

A financial predatory strategy coupled with a reputation effect has the benefit of raising barriers to entry. This, in turn, contributes to facilitate the recoupment of the initial profit sacrifice. And in this case, the recoupment could allegedly occurred on other markets that those where the predatory actions took place.

6.2 EVIDENCE OF LIKELY RECOUPMENT

Because the first prong of Brooke Group was not met (pricing below an appropriate measure of cost) the Court of Appeals did not examine whether there existed a dangerous probability of recoupment. However, the district court ruled that recoupment was unlikely. In short, the district court argued that because LCC had actually entered the route, there is no "structural barriers" to entry, and therefore American cannot sustain supra-competitive price on these routes. It follows that the pre-entry prices were not supra-competitive either. The district court also rejected the possibility of recoupment on other markets and focused solely on recoupment in markets were the alleged predation had taken place.

According to DOJ the existence of barriers to entry and the ability of American to price above competitive prices is demonstrated by the fact that American's price were competitive when facing SouthWest or other LCCs, but higher and indicative of earning supra-competitive earnings when not facing such competition. Therefore, this suggests evidence that American would be able to raise prices to monopoly levels once rivals have exited the route. In addition, the Braniff Airlines experience also

shows that American can raise prices after rivals exit the market. The District Court reports that when Braniff Airline moved its operation from DFW to Kansas City in 1988, "American's prices increased an average of 13% on the routes where it had formerly competed with Braniff".

DFW is one of the hubs of American where in 2000 it held a market share of above 70% of all passengers boarding a plane. As the ValueJet experience revealed, should an LCC establish a hub at DFW, this could have devastating consequences on American's revenue. Recoupment therefore should also include other routes in which American holds a monopoly position. American money-losing capacity addition on a few routes is a small investment to protect its monopoly rents on many other markets.

DOJ claimed that the LCCs have in general much lower operating costs than major hub carriers⁴⁶. One obvious cost advantage that LCCs have over traditional US carriers is the absence of stranding labour contracts. The threat posed by the entry of LCC to the current and future profits of American was clear. The elimination of such threat would justify sacrificing profit to preserve American monopoly profit on many routes out of DFW. And the predatory strategy would further raise barriers to entry against cash-strapped LCCs that will think twice not only before entering a route out of DFW but also before adopting DFW as a base of operation.

6.3 EVIDENCE OF PROFIT SACRIFICE

The courts review of this case focused largely around the determination of whether American had sacrificed profits in the short-run. Ensuing comments triggered by the case provided ample discussion on what is the relevant method to establish profit sacrifice.

6.3.1 USING PRICE AND COST DATA

DOJ offered four tests that purport to demonstrate such sacrifice. These tests are in the words of DOJ as follows:

- "Test 1: Whether incremental cost exceeded incremental revenue;
- Test 2: Whether long-run (18 month) AVC exceeded price;
- Test 3: Whether price was below American's 18-month cost measure (persistent negative profitability); and
- Test 4: Whether incremental (average avoidable) cost exceeded price"⁴⁷.

The District Court recognized that the four tests could be split into two distinct categories. Test 1 and 4 appear conceptually very similar. They check whether the incremental revenues generated by American's capacity addition were below the incremental cost of that capacity expansion. Test 2 compares price with LRAVC, whereas test 3 does exactly the same thing for a period greater than 12 months.

Based on the public record of the case, it is worth reviewing how DOJ implemented these various tests. Each test was based on the same costs and revenues included in AAIMSPAN, American's internal decisional-accounting system that is only used for decision-making but not for financial reporting. One important measure generated by this system, FAUDNC, serves primarily to establish the relative performance of American on the routes where it operates a service. FAUDNC is a fully-allocated earnings and cost measure reflecting revenues minus all costs. In fact, FAUDNC captured between 97% and 99% of American's total costs, including variable expenses, aircraft ownership, fixed overhead, interest, equity and income taxes. FAUDNC was constructed to also capture revenues generated by connecting passengers but subtract the cost associated with those passengers. DOJ claimed that FAUDNC was a measure of long run variable cost (LRAVC). However, according to the district court

⁴⁶ See *United States of America v. AMR Corporation et al.* District Court of Kansas.

⁴⁷ Reply Brief for Appellant United States of America.

some costs included in FAUDNC are neither variable nor avoidable with respect to American's capacity expansion on any particular route. Therefore, FAUDNC calculates a cost measure that is closer to average total cost, and this helps gauging the long run profitability of a particular route.

VAUDNC is another profitability measure that compares American's variable earnings with variable expenses as determined in American's accounting system. This variable computes costs that are deemed variable over an 18-month period. DOJ also proposed a refined measure of VAUDNC, termed VAUDNC-AC, which included the cost of aircraft ownership. DOJ claimed that VAUDNC-AC was a measure of short run average variable costs (SRAVC). The district court considered that aircraft ownership costs were fixed, and therefore disputed this interpretation.

Test 2 and 3 were based on FAUDNC only. Test 2 checks whether FAUDNC became negative following American's capacity expansion, while test 3 checks whether FAUDNC remains negative for at least one year. As discussed above, the district court argued that FAUDNC included too many fixed or unavoidable costs to be relevant. The court of appeals concurred with the district court maintaining that test 2 and 3 "are simply not proxies for marginal or incremental cost". Although we do not have enough elements to form an informed opinion on test 2 and 3 it would appear that test 1 and 4 were possibly a better way to address whether American had sacrificed profits in the short-run.

Test 1 was a "before-and-after" comparison using American's accounting decision system. Because American's reaction to the entry of LCC occurred in two steps, this enables DOJ to ground its counterfactual with hard data. In a first move, American matched the LCC low fares for some of its flights. In a second move, American increased its capacity while opening more seats to its low fares but did not cut down fare any further. Test 1 examines the change in profitability between these first and second moves using FAUDNC, VAUDNC and VAUDNC-AC. Because profits declined, DOJ claimed that American capacity increase were thus unprofitable. Conceptually DOJ attempted to show that it was more profitable for American not to add capacity once entry of LCCs had already taken place. In principle the profit comparison does not suffer from the fallacy of counting the profit loss resulting from the increased in competition following the entry of LCCs.

Test 4 is slightly different. DOJ utilized the change in VAUDNC-AC between the two moves to determine the incremental cost of the capacity addition. DOJ claimed that this was the average avoidable cost of the increment of capacity. This cost measure was then compared with the average fare from incremental local passengers.

Although the U.S. Court of Appeals 10th circuit upheld the summary judgment, deeming that "all four proxies are invalid as a matter of law, fatally flawed in their application, and fundamentally unreliable"⁴⁸, we discuss the reasons of the rejection of test 1 and 4, and conceptually depart from some of the court's conclusion.

The District Court retained that the only test for profit sacrifice is the comparison of price with average variable cost. This position is similar to the part of the AKZO test that is based on variable cost. Because DOJ did not show that prices (average revenues) were below such measure of cost, the district court rejected the predation claim in summary judgment. The Court of Appeals, however, considered that "sole reliance on AVC as the appropriate measure of cost may obscure the nature of a particular predatory scheme and, thus, contrary to what is suggested by the district court we do not favor AVC to the exclusion of other proxies for marginal cost"⁴⁹.

The district court also labeled tests 1 and 4 as a short-run profit maximization test. Arguably, it would be elusive to determine whether the price charged by American was below its profit-maximizing level. The Court of Appeal followed the reasoning of the district court and rejected test 1 because it was just

⁴⁸ United States of America v. AMR Corp. U.S. Court 10th Circuit.

⁴⁹ Ibid.

“looking to whether profits on the route as a whole decline after capacity was added, not to whether the challenged capacity additions were done below cost”⁵⁰, and this amounted to a profit maximization test. In general, we consider that a short-run profit maximization test is too speculative to be operational. However, we wonder whether conceptually test 1 is really such a test. As we argue in section 4.3 we accept compelling evidence showing that the predator has clearly foregone profits in the short-run. If it can be shown that in the presence of competing LCCs not adding capacity was more profitable, this is evidence that American had foregone profits, and it appears that was what DOJ attempted to demonstrate.

Alternatively, the Court of Appeals considered that test 4 did not suffer from such a flaw, and appeared to endorse the logic of such test as in practice it entailed comparing “the average revenues from incremental passengers who traveled after the capacity addition with the average avoidable cost of capacity addition”⁵¹. However, the court rejected test 4 because it contained “arbitrarily allocated variable costs”, and therefore it did not measure properly the incremental cost of American’s capacity expansion. This last criticism illustrates how difficult it might be to identify precisely the cost of the alleged predatory activities.

However, as argued by DOJ in its appellant brief, these two tests determine whether American’s capacity expansion was a profitable strategy, not even that there were alternative conducts that were more profitable. In other words, DOJ only attempted to show that American’s strategy of capacity expansion was losing money, and therefore did not make any business sense but for the exclusion of its rivals.

6.3.2 OTHER ECONOMIC EVIDENCE

Arguably, test 1 was rejected because according to the courts it only showed a decline in profit. When arguing over such a rejection the U.S. courts indicate that it would not consider predatory any aggressive reaction that remains profitable. First, if there is sufficient information and data to show that incremental revenues are below incremental cost, this is the better proxy of showing that marginal revenues is below marginal cost. However, revenues and cost measurement are inherently difficult. Had there been an obvious alternative course of action that is more profitable, there would be evidence that American had sacrificed profit. Such evidence tends to be more exploratory, yet easier to implement, than actually showing that incremental revenues were below incremental costs.

In the present case, it would appear that such evidence was clearly available. The first evidence available was American’s reaction to various type of entry. It appeared that American was more aggressive when on routes entered by Vanguard, Western Pacific and Sun jet than that with SouthWest, a well-established LCC. In fact, DOJ claimed that it demonstrated that “American’s capacity changes were systematically profitable in most markets, including markets where American competes with SouthWest, they were systematically unprofitable in LCC markets”⁵².

American took other actions likely foregoing short-run profits. For example, the fact that American increased its capacity far beyond the increase in passenger demand provide compelling evidence that a smaller capacity increase would have been more profitable. It is reported that there were three empty seats for every additional local passenger that American attracted, hardly a healthy business strategy in the short run⁵³. In addition, Americans re-entered routes that it had deemed unprofitable prior to the entry of LCCs. In June 1994, American had abandoned its scheduled air transport service on the route DFW-Long Beach. At the same time, Sun Jet started operating a non-stop service on the same route. When it became clear that Sun Jet’s strategy presented a clear opportunity to establish a DFW hub,

⁵⁰ Ibid.

⁵¹ Ibid.

⁵² Reply Brief for Appellant United States of America.

⁵³ Reply Brief for Appellant United States of America.

American re-entered the route in December 1995⁵⁴. Why would DFW-LGB become a profitable route once Sun Jet operates whereas it was not before when American did not face any rival?

Before Vanguard entered the route DFW-Wichita, American had decided to switch its jet service to propeller that it deemed more profitable. When it became clear that Vanguard's strategy would lead to the establishment of a mini-hub at DFW, American decided to re-introduce jet services, increasing capacity by 35%, although its turboprop service was profitable. It is difficult to square how jet service deemed unprofitable before the entry of Vanguard, become a more profitable strategy when American faces more competition. On DFW-Colorado Spring, American decided to increase capacity by notably substituting three aircrafts with the larger Boeing 757s. It had already increased capacity by 43% by replacing its seven F-100 flights per day with eight MD-80s. In the words of the district court, "it is unusual that American used 757 aircraft on DFW-COS"⁵⁵. Overall, these elements are probative and suggest that American had chosen a strategy that was foregoing profits in the short-run.

6.3.3 THE DISPUTE OVER COSTS

DOJ used VAUDNC-AC as a proxy for short-run average variable cost. Unlike DOJ, the District Court considered that aircraft ownership costs are fixed. Although we would tend to agree with DOJ that aircraft ownership costs are certainly variable over the short run, after all an aircraft can be leased, if anything this exemplifies how difficult it is to agree on what is variable and fixed cost in this type of cases.

DOJ argued that the relevant cost measure is incremental cost, while the District court maintained that the marginal cost of serving an additional passenger is very close to AVC. It is certainly true that the additional cost of carrying an additional passenger on the same plane is not very different from the average variable cost of operating that plane. But the predatory allegation is that American embarked in money-losing capacity addition. Therefore, the cost of adding capacity, that is, either adding flights or switching to larger aircrafts can be quite different from either market-wide AVC or flight AVC. As DOJ stated "the cost of adding 10 passengers on an existing flight is (not) the same as its cost of adding a new flight to carry those same 10 passengers"⁵⁶. In fact adding 10 passengers to an existing flight will contribute additional revenues to cover the operating of that flight; which is the not the same as adding a new flight to carry 10 additional passengers.

Because the load factor of the added capacity was extremely low, 3 empty seats for every additional local passenger, the incremental cost must be increasing. Indeed, the overall load factor must decline as American operated planes with more available seats than before. As a result, the incremental cost per passenger as measured over all incremental passengers must be greater than the average variable cost over the entire route⁵⁷. Therefore, as DOJ argued using AVC may actually mask the predatory action of American. As Edlin and Farrell (2002) correctly point out, if the load factor decline with the capacity expansion, the unit cost of carrying a passenger has increased. In fact, American strategy would appear to run contrary to yield management principle that aim at filling up the plane, and only operate flights that have a load factor not below certain level, usually the break-even point.

In conclusion, although the U.S. Court of Appeals dismissed DOJ appeal because of the inappropriate cost measure utilized by DOJ expert to show profit sacrifice, the case illustrates how our proposed method could be implemented. It must be clear that the level of detail and evidence ought to be much higher than what has been mustered in this example to consider even raising any objections.

⁵⁴ United States of America vs. AMR Corp. United States District Court for the District of Kansas.

⁵⁵ Ibid.

⁵⁶ Brief for Appellant of the United States of America

⁵⁷ See Edlin and Farrell (2002) for a numerical example.

7 FINAL REMARKS ON PRACTICAL IMPLEMENTATION

To conclude we discuss in more detail each of the three steps of this rule of reason. In particular, we provide some general guidance in relation to the type of evidence that need to be brought to the fore.

To show likely exclusion a competition agency can rely on empirical elements derived from economic theories of rational predation. By showing rigorously that some predation scheme is rational, the analysis draws attention to attributes of the predation process that it profitable.

To show likely recoupment a competition agency must assess the ability of the alleged predator to exercise increased market power after rivals are excluded or disciplined. Three elements are particularly important. First, the likelihood that new entry will take up the place of the exit or marginalized prey. Second the possibility of re-entry. Third, an assessment of how significant a competitive constraint was the prey imposing on the predator.

To show actual sacrifice we propose two alternatives. First, if sufficient data is available, determine whether the incremental costs of the alleged predatory practice are above incremental revenues. Second, if there exists compelling evidence regarding exclusion and recoupment is compelling it may be sufficient to determine whether there exists a more profitable course of action in the absence of exclusion. In some instances traditional price-costs tests may be prove useful in the assessment of actual profit sacrifice, but only insofar they provide an indication of actual sacrifice.

This approach is superior to the current AKZO test. First, it is easier to administer. Profit sacrifice can be proven even without a complex and controversial analysis of average costs and prices and without entering into a futile and never-ending dispute regarding the relevant cost benchmark. Second, the proposed approach reduces false negatives, in particular in cases of non-price predation. A comparison of prices and costs can be seriously misleading when firms compete primarily in dimensions other than price. In any event, it is always preferable to concentrate on establishing whether predation would be rational in the given circumstances. Third, it also reduces false positives by placing the focus on proving that a rational predatory strategy exists and that the predator has acted pursuant to that strategy. There is no predation if this is not profitable. It may not be, either because it cannot credibly lead to exclusion or entry deterrence, or because some competition constraints will remain making the prospect of recoupment unrealistic.

The EC Guidance paper on Article 102 offers a departure from the traditional AKZO legal rule, by opening the assessment of predation cases beyond the simple price-cost test. In particular, it leaves the possibility of showing profit sacrifice using evidence about other profitable alternatives. It also requires an assessment of anticompetitive foreclosure and thereby relies on modern economic theories of predation along the lines discussed in this paper. This appears to be a good starting point to discriminate between pro-competitive aggressive pricing and rational predation, and provides the appropriate analytical framework to establish enforcement priorities in this difficult area.

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