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## Safe Harbors for Quantity Discounts and Bundling

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ECONOMIC ANALYSIS GROUP  
DISCUSSION PAPER

Safe Harbors for Quantity Discounts  
and Bundling

by

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## **Abstract**

The courts and analysts continue to struggle to articulate safe harbors for a wide variety of common business pricing practices in which either a single product is sold at a discount if purchased in bulk or in which multiple products are bundled together at prices different from the ones that would emerge if the products were purchased separately. The phenomenon of tying in which the sale of one product is conditioned on the purchase of another is closely related to bundling. Its analysis relies on the same economics as that used to analyze bundling (see, e.g., Carlton and Waldman (2008)), though the law seems to make a distinction between the two. The need for safe harbors for common business pricing practices arises from the recognition that these practices often are motivated by efficiency and that a broad antitrust attack on them could cause more harm than good. In this essay, we analyze and propose safe harbors for quantity discounts and bundled products. In analyzing the latter case, we discuss the deficiencies of the particular safe harbor proposed in the report of the Antitrust Modernization Commission (2007) (AMC) of which Carlton was a member.

## **Safe Harbors for Quantity Discounts and Bundling**

The courts and analysts continue to struggle to articulate safe harbors for a wide variety of common business pricing practices in which either a single product is sold at a discount if purchased in bulk or in which multiple products are bundled together at prices different from the ones that would emerge if the products were purchased separately. The phenomenon of tying in which the sale of one product is conditioned on the purchase of another is closely related to bundling. Its analysis relies on the same economics as that used to analyze bundling (see, e.g., Carlton and Waldman (2008)), though the law seems to make a distinction between the two. The need for safe harbors for common business pricing practices arises from the recognition that these practices often are motivated by efficiency and that a broad antitrust attack on them could cause more harm than good. In this essay, we analyze and propose safe harbors for quantity discounts and bundled products. In analyzing the latter case, we discuss the deficiencies of the particular safe harbor proposed in the report of the Antitrust Modernization Commission (2007) (AMC) of which Carlton was a member.

We begin with an explanation of the central economic issue that motivates antitrust concern with pricing practices such as quantity discounts and bundling.

### **Central Economic Issue**

The central antitrust concern with various pricing practices is their potential to exclude or disadvantage rivals, thereby allowing a firm to exercise market power and harm consumers. As explained in other articles (see, e.g. Carlton (2001, 2007b)), an antitrust claim involving exclusion requires that there be harm to a rival, harm to consumers and a linkage between the harm to the rival and the harm to consumers. For example, a monopolist who switches from simple monopoly pricing to discriminatory pricing may harm consumers but because no rival is affected such a switch should not (and is not) regarded as violating the antitrust laws. This reasoning suggests that all mechanisms of exclusionary pricing conduct that do not alter a rival's costs of operating or impair his ability to exist should not trigger an antitrust violation. In particular, this means that if there are no such effects, as for example occurs when the production technology is constant returns to scale, then there can be no anticompetitive harm. This

does not mean that the rival's business is unaffected nor that consumers are unaffected by a new pricing policy, but simply that the mechanism of harm, if there is one, has nothing to do with excluding a rival. The rival's constraining effect on competition is by assumption unchanged. The economist's search for antitrust harm should therefore be focused primarily, if not exclusively, on cases where some rival is so deprived of scale that it goes out of business (or its competitive influence is significantly impaired), thereby enabling the firm practicing the pricing to exercise increased market power on some product. Notice how similar this description is to the standard description of price predation. Indeed, it is this similarity that motivates the AMC test for bundling, but as we shall see, it is flawed.

### **Single Product Pricing**

Consider the standard price predation story in order to establish the relevant analytic framework to assess claims of exclusionary pricing behavior. One firm lowers price below its marginal cost, drives rivals out of business, and then recoups by raising price to monopoly levels. Recognizing that antitrust attacks on aggressive price cutting could chill the competitive process, courts require that a) price be below the firm's cost (though how to measure cost is a subject of debate and b) recoupment is possible and likely. Prong a) is something a firm can figure out (assuming it knows what cost a court will use), and so gives guidance to a firm in a way that a standard requiring a firm to price above its rivals' costs would not since the firm does not know its rivals' costs. Prong a) really is saying that pricing below a firm's own cost is so unusual that it warrants suspicion. It is well recognized that in theory there can be above cost predation by a very efficient firm (price above the firm's costs but below that of its rivals) that Prong a) will allow, but that is viewed as a reasonable price to pay in light of the fear of chilling beneficial price competition.

Prong b) is a reflection of the principle that with constant returns to scale rivals will always constrain price and there can be no recoupment. The reason is that with no fixed costs, entry is always possible and guarantees that there is a competitive constraint on price. Prong b) is phrased more practically to cover deviations from constant returns to scale that are not so large as to allow recoupment. With no possibility of

recoupement, there is no reason to incur the initial losses associated with pricing below cost.

With this discussion as background, let us consider quantity discounts. In particular, let us try to find the analogous tests to Prongs a) and b) of the tests for the standard predation story.

Quantity discounts are ubiquitous in practice. They can reflect efficiency savings arising from a variety of sources such as savings in shipping costs or from being able to plan production. In the absence of efficiencies, they have been well studied as a method of price discrimination in which the firm is trying to extract the surplus especially of its largest buyers. (See e.g. Tirole (1988), Carlton Perloff (2005, Ch.10)). The pricing schedule can be described as  $E(q)$  where the expenditure,  $E$ , depends on the quantity,  $q$ . If all goods sell for the same price,  $P$ , then  $E(q) = Pq$ . With quantity discounts,  $E(q)$  will have the property that it increases with  $q$  at a slower rate than with linear pricing. Under some reasonable assumptions, one can show that the incremental expenditure from purchase of an additional unit will generally exceed marginal cost at each quantity purchased in the profit maximizing solution. Therefore, it is not generally profitable to make an additional sale to a buyer if the additional revenue does not cover marginal cost. Hence, just as in the more familiar standard predation story (Prong a), if for any quantity level one sees incremental expenditure below marginal cost, it raises suspicion. But there is an important caveat.

When there is the same price for each unit, as in the standard predation story, selling below a constant marginal cost generates a loss. That is not so here. Indeed, it is sometimes the case that non linear pricing schedules can have minor discontinuities and can violate the condition that incremental expenditure exceeds marginal cost in the sense that total expenditure falls if one buys one more unit -- e.g., if you buy 11 units it will cost more than buying a dozen because there is a discount for buying 12. When this occurs, it is because a pricing scheme that gives, say, a 10% discount for buying a dozen items is easy to describe. The real issue is whether such situations are so frequent and systematic that they result in such a huge shift of volume that it significantly lowers profit from what it would be if no discounts were offered. If so, then just as in the standard predation story, the pricing is peculiar in that it appears to be a significant deviation from

profit maximizing behavior even when one accounts for the transaction cost savings of having a simple scheme to describe pricing.<sup>1</sup> Otherwise, these minor discrepancies should be ignored.<sup>2</sup>

Prong b) of the standard predation test requires that recoupment is possible and likely. A similar requirement applies to a predation story involving quantity discounts. If either the rival will not be driven out, or if re-entry can occur with no penalty, then recoupment is not possible and the claim of anticompetitive exclusionary pricing should fail.

The mere fact that one firm's pricing structure reduces the sales of a rival should not be sufficient to sustain an antitrust claim. The mere existence of sunk costs or scale economies of a rival is also not sufficient. We have seen the following incorrect argument: "there is a sunk cost to enter, hence there are scale economies. Depriving a rival of scale will therefore raise its costs." This argument confuses average with marginal costs. As long as the rival is not driven out, the rival's marginal cost determines its competitive effect. Once incurred, a sunk cost does not affect the rival's behavior. Depriving an existing rival of scale will not necessarily reduce the rival's competitive significance as long as marginal costs are non decreasing and the rival remains in the industry.<sup>3</sup>

## **Bundling**

Bundling products together and selling the package at a price different from the sum of the prices of the products bought separately is common. Just like quantity discounts, bundling can be efficient and can also be a method of price discrimination. The Peacehealth (502 F. 3d. 895) and LePage's (324 F. 3d. 141) cases have raised the

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<sup>1</sup> Over what range of output should we require that incremental expenditures exceed marginal cost? That strike us as an empirical question that will depend on the particular industry. Remember we are trying to identify behavior that is such a deviation from profit maximization that it requires additional scrutiny. One very conservative approach would be to require that the total sales to each individual customer (or to the large majority of them) be profitable. This is asking whether the total expenditure from a customer covers his incremental costs.

<sup>2</sup> If it is unclear whether a firm passes this test, one can go on to ask whether the volume shifted away from a rival as a result of the questionable pricing is sufficient to deprive the rival of necessary scale, causing the demise (or an increase in the costs) of the rival.

<sup>3</sup> If the rival's investments in, for example, new products or new techniques, is adversely affected, then there can be an anticompetitive harm.

issue of exclusionary bundling. Under what circumstances can bundling be used to harm competition and thereby harm consumers?

Imagine the following situation. The monopolist of A charges \$10. Product B is sold competitively at \$5. The monopolist practices price predation on B by charging a below-cost price of \$4, drives all rivals out of business and then prices B at \$6. The monopolist is guilty of price predation, assuming that recoupement is likely.<sup>4</sup>

Now consider the following. Suppose that each customer who wants B also wants A. Instead of selling B at \$4, and assuming the firm will drive out rival sellers of B, the monopolist bundles together products A and B and sells them for \$14, as well as selling A separately for \$10. The effect is similar to selling B for \$4, driving out rivals, thereby eventually allowing the package price to rise to \$16. Under the AMC test for a safe harbor, which is analogous to Prong a) of the standard predation test, one would assign the “discount” of  $\$10 + \$5 - \$14$  or \$1 to the \$5 price of B and compare the “net” price of B ( $\$5 - \$1$ ) to B’s marginal cost of \$5.<sup>5</sup> Since the “net” price of \$4 fails to cover marginal cost, then the pricing fails to fall into the AMC safe harbor.

The AMC test does make sense in terms of the context of the simplified predation example just given. However, as explained in Carlton’s separate AMC statement, it is not true that a calculation such as the AMC’s will reveal pricing so aberrational from profit maximization that it suggests further inquiry. This is a major difference with Prong a) of the standard test for predation.

The reason why pricing that fails the AMC test can be perfectly rational absent exclusionary conduct has to do with price discrimination. It is well known (See, Carlton Perloff (Ch.10)) that bundling can be a profitable method to separate consumers into two groups, those who really want A alone and those who do not. This separation can allow the firm to use bundled pricing to extract additional value from consumers and thereby

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<sup>4</sup> The theoretical difficulties with this story are well known but we ignore them here to make our point.

<sup>5</sup> An alternative would be to look at whether the price of the bundle exceeds the marginal cost of the bundle. This test does not deal as precisely with the predation story presumably underlying the AMC test in which the predation is in Product B. It has the property that it likely would be an easier standard to pass than the first prong of the AMC test.



increase the firm's profits. The AMC test ignores this rationale for bundling and accordingly non-exclusionary profit maximizing pricing can flunk the AMC test.<sup>6</sup>

To see how bundling can be used to price discriminate, suppose that there are two consumers, one consumer is willing to pay \$15 for A but places no value on B, while another consumer is willing to pay \$11 for A and \$6 for B. Suppose B is sold competitively for \$5, the constant marginal cost of producing B. The monopolist of A will charge \$11 for A when he sells only A, will sell 2 units, and will earn \$22 where, for simplicity, we assume that there are no costs to producing A. With (mixed) bundling, the monopolist of A will charge \$15 for A alone and \$16 for the bundle (A,B)<sup>7</sup>. This pricing fails the AMC safe harbor test (the discount is  $\$15 + \$5 - \$16 = \$4$  so the net price of B is \$1, which is well below B's marginal cost.). Each consumer will buy from the monopolist and no firm that sells only B will exist. Yet there is no competitive harm to consumers of B since they continue to benefit from the competitive constraint on the price of B of \$5 imposed by potential producers of B. (The consumer who values A at \$15 is worse off as a result of the bundling, but not as a result of the elimination of B.) Indeed, suppose that there are many consumers who value B alone at \$5 and place no value on A. They would continue to be served by producers solely of B. No exclusion of rivals occurs, yet the AMC safe harbor test is failed.

The second prong of the AMC safe harbor test is recoupement.<sup>8</sup> The AMC asks (or should ask) whether the price of B could rise, just as in the standard predation story, if one fails to fall into the safe harbor of the first prong of the test.<sup>9</sup> This makes perfect sense in terms of the context of price predation. The court in *Peacehealth* dismissed this

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<sup>6</sup> The AMC test has buried in it an assumption that, in the absence of the bundle price of \$14, the price of A remains at \$10. This was true in the predation example I gave earlier. But, it is quite likely that, in the absence of the bundle, the price of A will fall when bundling is used as a method to price discriminate, as the next example in the text shows.

<sup>7</sup> At \$16, the consumer buys the bundle and enjoys \$1 worth of surplus. If the bundle were priced at \$17 which generates zero surplus for the consumer, the consumer would forego the purchase of the bundle and instead buy B for \$5 and enjoy the surplus of \$1.

<sup>8</sup> There is a third prong to the AMC test. There must be no competitive harm. One fails the AMC test only if one fails all three prongs. This third prong presumably prevents the full AMC test from making an error. But as the court in *PeaceHealth* notes, it is unclear what the point of a safe harbor test is if it requires a full blown analysis of competitive effects.

<sup>9</sup> In addressing recoupement, the logic of the AMC test would seem to require that recoupement in Product B occur. However, the prong of the AMC test dealing with recoupement focuses on the entire bundle. See, Jacobson (2007) for some justifications.

prong by claiming that there can be “simultaneous” recoupement. What the court means is that in equilibrium there will be no producers of only B, so that the price of B will be high. There is an instantaneous recoupement if the predation happens quickly or if the threat of predation deters entry. There is no dynamic story in the court’s thought process – the decision cites Nalebuff (2005) who uses a static model – while there is a dynamic story underlying the AMC test. Whether the recoupement is simultaneous or delayed, as it is in the usual price predation story, is a detail. The key issue is whether the price of B can rise above the competitive level.

If one accepts the proposition that the antitrust laws should not prevent price discrimination, then an alternative (or perhaps complement) to the AMC test is as follows: are consumers of B who do not consume A made worse off because the bundling excludes independent producers of B?<sup>10</sup> This test has the virtue that it requires exclusion of rivals and consumer harm. It also asks a more focused question than a general rule of reason analysis as to whether there is competitive harm. It means that a single product firm (producing just B) that can stay in business to serve customers for B without suffering any significant marginal cost elevation should generally not prevail in an antitrust claim of bundling against a multi-product rival. The reason to focus on customers who demand only B is because the extraction of the consumers surplus of customers who also consume A is a form of price discrimination that, as already explained earlier, should be immune from antitrust challenge.

## **Conclusion**

Various common pricing practices have been the focus of recent antitrust attention. Quantity discounts and bundled pricing (including tie-in sales) can work to benefit consumers by improving efficiency or can work as a method of price discrimination. If used for these purposes, the antitrust laws should not be used to attack them. These pricing mechanisms can also harm competition by depriving rivals of the necessary scale to succeed, forcing their demise and creating market power. The antitrust laws should be used to deter his type of behavior.

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<sup>10</sup> In contrast, Greenlee et al. (2004) propose tests for bundling in which they examine lower consumer welfare arising from price discrimination.

Safe harbors based on standard tests for predatory pricing can be adapted for quantity based discounts but not for bundling. The standard test for predatory pricing consists of two prongs each of which answers a well-posed question. First, is price below cost? Second, will rivals be driven permanently out of business or permanently impaired, so that the predating firm can raise price and more than recoup its losses from pricing below cost?

It is relatively straightforward to adapt the two prongs of the standard test for predation to the use of quantity discounts. The first prong of the test becomes: is an incremental expenditure ever below cost and, if so, is the phenomenon sufficiently systematic that it represents a significant deviation from profit maximization once transaction costs are taken into account? The second prong asks the same question as in the standard test as to whether recoupment is possible and likely.

For bundled pricing, it is not possible to modify the standard test simply and the AMC's attempt to do so has some flaws.<sup>11</sup> The first prong of the AMC safe harbor test can falsely flunk non-exclusionary profit maximizing pricing behavior. It is the first prong of the AMC test that has received court acceptance and which will likely remain its important influence. No test is perfect but, as Carlton's separate AMC statement (2007a) explains, the first prong of the AMC test will fail to immunize lots of pricing that does not raise an antitrust concern. Therefore, we propose an alternative test as either a substitute or as an additional safe harbor. An alternative test is to focus on whether allegedly harmed rivals survive and can serve their customers efficiently. If so, the defendant should prevail.

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<sup>11</sup> These flaws were generally understood by the AMC. See Jacobsen (2007).

## References

- Antitrust Modernization Commission (AMC), Report and Recommendations, (April 2007).
- Carlton, Dennis, Antitrust Modernization Commission (AMC), Report and Recommendations, "Separate Statement," (2007a).
- Carlton, Dennis, "Does Antitrust Need to be Modernized," Journal of Economic Perspectives, (2007b).
- Carlton, Dennis, "A General Analysis of Exclusionary Conduct and Refusal to Deal – Why Aspen and Kodak are Misguided," Antitrust Law Journal, (2001).
- Carlton, Dennis and Waldman, Michael, "Tie in Sales", W. Collins ed., Competition Policy, American Bar Association, (2008).
- Carlton, Dennis and Perloff, Jeffrey, Modern Industrial Organization, Addison Wesley (2005).
- Greenlee, Patrick, Reitman, David and Sibley, David, "An Antitrust Analysis of Bundled Loyalty Discounts," EAG Discussion Paper (2004).
- Jacobson, Jonathan, "Evaluating the Antitrust Modernization Commission's Proposed Test for Bundled Pricing", Antitrust, (Summer 2007).
- Nalebuff, Barry, "Bundling as Barrier to Entry," Quarterly Journal of Economics, (2004).  
Tirole Jean, "The Theory of Industrial Organization," MIT Press, (1988).