

WHEN DO PROPRIETARY AFTERMARKETS BENEFIT CONSUMERS?

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I. INTRODUCTION

Potential benefits to consumers, as well as possible legal roadblocks, can occur when a manufacturer adopts what is sometimes known as a "razor/razor blade" strategy¹ and then maintains this strategy by defending a "proprietary" aftermarket. A necessary characteristic of the strategy is the sale of component products that are strict complements for each other (i.e., each component is not useful without the other). One component, typically called the "initial" component, is durable and is sold in the "foremarket," while the other component is directly consumed through usage and is sold in the "aftermarket." In addition, the manufacturer usually will seek to keep control of this "system" of components by preventing the use of other manufacturers' components with the system,² and will price the initial (durable) component relatively cheaply, earning the bulk of its profits from sales of the "aftermarket" component.

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¹ "Razor/razor blade" may be something of a misnomer for the strategy that we analyze in this article, in that manufacturers of razors and razor blades may or may not underprice razors and earn profits on blades, and preserve this strategy by making other manufacturers' blades incompatible with their razors. However, we have found that the term is a useful shorthand that contributes to conveying the relevant concepts, which are applicable in a number of real instances, notwithstanding any questions about the applicability of the facts regarding actual razor and razor blade manufacturers. Previous antitrust cases involving razors dealt with horizontal merger issues or counterclaims related to trademark infringement. See, e.g., *United States v. Gillette Co.*, 1990-2 Trade Cas. (CCH) ¶ 69,142 (D.D.C.); *Warner-Lambert Co. v. Schick U.S.A., Inc.*, 935 F. Supp. 130 (D. Conn. 1996).

² In addition to the examples of proprietary systems discussed *infra*, there are examples of great historical significance in the development of the antitrust law. For example, in *International Salt Co. v. United States*, 332 U.S. 392 (1947), International Salt Co. tied the use of a salt tablet-making machine and salt supplied by International Salt Co. In *IBM v. United States*, 298 U.S. 131 (1936), IBM required users of IBM computers to purchase from

Razor/razor blade strategies can be found throughout our everyday life. For example, cellular phones are often sold at very cheap prices, or even given away, on the condition that the customer purchase the air-time from the same producer.³ Margins on automobiles are remarkably thin, especially compared to the margins earned in sales of automobile parts and options. Some computer data storage drives are priced with little or no margin, while profits are earned on the compatible disks. Some cameras are sold at reduced prices but require a special (and relatively expensive) type of film. Likewise, medical equipment is often sold at a low up-front cost, while profits are earned on the aftermarket components, such as replacement electrodes and supplies used in performing procedures. Similarly, some computer game manufacturers sell game consoles at or below cost, earning virtually all of their profits from sales, license fees, and manufacturing charges on software. Initial versions of computer programs frequently are sold cheaply, or even given away, in the hope of building an installed base and brand recognition, after which subsequent upgrades or improvements are sold at a greater profit.

In recent years it has been argued that the razor/razor blade strategy is harmful to consumers and should be the subject of antitrust enforcement.⁴ One claim is that the proprietary nature of the system creates an illegal "tie" between the initial and aftermarket components, and that the proprietary nature of the system either creates or extends market power into the markets for other components. Another claim is that consumers, having invested in a particular brand of initial product, are now locked-in to that brand of aftermarket products, losing the benefits of competition among system sellers and becoming subject to anticompetitive exploitation in a relevant market composed of only one brand of the aftermarket product.

We think that the razor/razor blade strategy frequently, if not generally, benefits rather than harms consumers. As we explain below, the

IBM tabulating punch cards (at that time necessary for data and program input). *In re IBM Peripheral EDP Devices Antitrust Litigation*, 481 F. Supp. 965 (N.D. Cal. 1979), *aff'd sub nom. Transamerica Computer Co. v. IBM*, 698 F.2d 1377 (9th Cir. 1983). IBM altered the interface between its mainframe computers and plug compatible components, such as printers, to make other manufacturers' equipment incompatible. Additional examples are cited in ALFRED KAHN, *LETTING GO: DEREGULATING THE PROCESS OF DEREGULATION* 81 (1998).

³ See, e.g., *Cel-Tech Communications, Inc., v. Los Angeles Cellular Tel. Co.*, 69 Cal. Rptr. 2d 207 (Cal. App. 1997) (plaintiff was a seller of cellular telephones alleging that "L.A. Cellular sold cellular telephones below cost as a strategy to gain subscribers for its cellular service. . .").

⁴ See, e.g., *KentMaster Mfg. Co. v. Jarvis Prods. Corp.*, 146 F.3d 691 (9th Cir. 1998) (alleged tie between cheap equipment and expensive maintenance).

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strategy of pricing the initial product low and earning profits on aftermarket sales tends to succeed only with good product quality and aftermarket support. As a result, the pricing strategy itself provides important consumer information about product quality and continued support. This pricing strategy also makes the products accessible to a larger base of users. In addition, the razor/razor blade strategy typically will increase manufacturer profits and incentives for innovation, as well as total welfare and consumer welfare. Our ultimate conclusion is that the razor/razor blade strategy is more likely to benefit competition and that the antitrust laws should more explicitly allow for the protection of proprietary aftermarkets when it does.

The issue of protecting a proprietary aftermarket is particularly important because, once a manufacturer adopts a strategy in which profits are disproportionately earned on one component of the system, powerful incentives are created for other manufacturers to begin to enter the aftermarket and produce only the profitable component. Typically, such entry destroys the viability of the razor/razor blade strategy established by the original manufacturer, thereby vitiating the procompetitive effects of such strategies and making them less likely to be adopted by manufacturers in the future. What is both seemingly paradoxical and legally problematic is the logical conclusion that preventing others from supplying an aftermarket component by defending a proprietary aftermarket could benefit consumers and therefore be consistent with, rather than contravene, traditional competition goals.⁵ But this is the case we seek to make.

⁵ This is clearly the view expressed in *Elliott v. United Center*, 126 F.3d 1003, 1005 (7th Cir. 1997):

The logic of Elliott's argument would mean that exclusive restaurants could no longer require customers to purchase their wines only at the establishment, because the restaurant would be "monopolizing" the sale of wine within its interior. Movie theaters, which traditionally (and notoriously) earn a substantial portion of their revenue from the sales of candies, popcorn, and soda, would be required by the antitrust laws to allow patrons to bring their own food. The fact that there is more than one exclusive restaurant, and more than one movie theater, does not distinguish these examples from the case before us, although we anticipate that Elliott would argue that it does. For Elliott's principal point is that the customer knows that once he is ready to walk through the entry gate, he may not have with him any "outside" food. The same can be said of any of the establishments we have just mentioned: once inside a restaurant, or a movie theater, the customer is at the mercy of the place he has chosen. The price of the refreshments or the wine is just one part of the price of the evening out. Elliott suggests that the United Center under this theory could also "monopolize" the parking lots around it, which we suppose is true.

For a contrary view, see *HP's New Product/Antitrust Violations*, 1998 RECHARGER 23 (1998) (arguing that an unpublished opinion in *Hewlett-Packard Co. v. Nu-Kote International, Inc.*, No. C-94-20647 (N.D. Cal.) (order granting in part and denying in part Nu-Kote's motion

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II. THE ECONOMICS OF THE RAZOR/RAZOR BLADE STRATEGY

What is the impact on manufacturer profits, consumer welfare, and total welfare⁶ of a policy that allows manufacturers to pursue a razor/razor blade strategy? Since the razor/razor blade strategy is only viable when the manufacturer can ensure that it supplies the important aftermarket components of the system, this analysis boils down to a comparison of "proprietary systems competition," where the key components of a system are sold by a single manufacturer, and "open systems competition," where components are supplied by different manufacturers. For example, if manufacturer *A*'s razor permitted the use of only manufacturer *A*'s razor blades, so that manufacturers *B*'s, *C*'s, and *D*'s blades were incompatible, we would call manufacturer *A*'s razor and blade combination a "proprietary" system. In contrast, if razors manufactured by *A* could be used with blades manufactured by any of the manufacturers *A*, *B*, *C*, or *D*, manufacturer *A* would be producing razors in an "open" system.

In open systems competition, prices for each component are determined by competition among suppliers of the particular component. In proprietary systems competition, prices for systems are determined by competition among suppliers of systems.

A. A SIMPLE BENCHMARK CASE

Consider a hypothetical market for shoes. Shoes are consumed in fixed proportions, one left shoe being consumed along with one right shoe. Consumers are well aware of this consumption pattern (e.g., they would not be surprised upon purchasing a left shoe to learn that a right shoe is also required before the shoes are useful). There are a number of competing manufacturers of shoes, and each manufacturer is just as capable of making left shoes as making right shoes. Shoes produced by different manufacturers are differentiated, so each manufacturer has some degree of market power (the manufacturer faces a downward sloping demand curve for its product). Assume further that the competi-

for preliminary injunction), endorses the concept that protection of an aftermarket through design changes can be an antitrust violation, notwithstanding the court's denial of a preliminary injunction on antitrust grounds).

⁶ Consumer welfare (also known as consumer surplus) is the cumulative difference between the consumers' valuation of each unit of a good and the market price of that good. Producer surplus (also known as profits) is the cumulative difference between the selling price of each unit of a good produced and the producer's cost of providing that good. Total welfare is the sum of consumer and producer surplus. These are the fundamental measures of the benefits to economic agents resulting from the functioning of markets.

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tion among manufacturers is such that the resulting market price is \$50 per shoe, or \$100 per pair, and consumers are well informed about market prices and product availability.

If consumers did not mind mixing brands of shoes to construct a pair, we could have open systems competition; a "system" or pair could be composed of different manufacturers' shoes. In this case, competition among manufacturers of left shoes would drive the price of left shoes to \$50, and competition among manufacturers of right shoes would drive the market price of right shoes to \$50.

However, if consumers will not mix brands of shoes to make a pair, we have "proprietary" systems competition among manufacturers of "systems" or pairs of shoes. A manufacturer could "overprice" left shoes, say at \$75, provided that the right shoe was sold at no more than \$25, because competition among manufacturers of systems would drive the price of a pair of shoes to \$100. In fact, under these conditions, the prices of left and right shoes separately are really irrelevant; all the consumer cares about is the price of a pair. Thus, in this example \$100 is the "baseline competitive" price for a system composed of two components that would, under open systems competition, sell for \$50 each.

This exceedingly simple comparison of open and proprietary systems competition illustrates an important point. A manufacturer of a proprietary system does indeed have the discretion to price components differently than the baseline competitive prices. However, because systems competition will, at least when products are consumed in fixed proportions and consumers have adequate information, force any overcharges on one component to be given back in the form of undercharges on other components, it is evident that the ability to overcharge on some component is not evidence of the type of market power proscribed by the antitrust laws.⁷ In such cases, manufacturer market power is not

⁷ See Benjamin Klein, *Market Power in Aftermarkets*, in *ECONOMIC INPUTS, LEGAL OUTPUTS: THE ROLE OF ECONOMISTS IN MODERN ANTITRUST* 47 (Fred S. McChesney ed., 1998). Courts have been clear that an anticompetitive effect is not demonstrated when the price of one product is expensive only because the sale of a complementary product is cheap. For example, in *United States Steel Corp. v. Fortner Enterprises*, 429 U.S. 610, 621 (1971), the Supreme Court rejected the claim that a tying arrangement involving credit terms and new houses harmed competition because the "unusual credit bargain offered to Fortner proves nothing more than a willingness to provide cheap financing in order to sell expensive houses." See also *Kypta v. McDonald's Corp.*, 671 F.2d 1282, 1285 (11th Cir. 1982) ("injury resulting from a tie-in must be shown by establishing that payments for both the tied and tying products exceeded their combined fair market value"); *Casey v. Diet Ctr. Inc.*, 590 F. Supp. 1561, 1571 (N.D. Cal. 1984) ("to demonstrate the injury necessary to establish defendant's liability, plaintiff must prove that the payment for both the tied and the tying product exceeded their combined fair market value").

enhanced by the use of proprietary systems versus open systems competition. Manufacturer profits, consumer welfare, and total welfare are unaffected.

While manufacturers engaged in proprietary system competition under fixed proportions and full information would have the ability to charge component prices that differ from baseline competitive component prices, there are no additional profits to be made by doing so. Accordingly, the fixed proportions assumption must be lifted if we are to understand why systems manufacturers so often adopt razor/razor blade strategies. Because we can safely assume that manufacturers prefer pricing flexibility only when it increases their profits, the relevant antitrust questions are: (1) how does pricing flexibility increase manufacturer profits; and (2) do greater manufacturer profits correspond with increased or decreased total and consumer welfare?

B. THE EFFECT OF VARIABLE PROPORTIONS

As an example of variable proportions, a consumer can, and does, purchase different amounts of airtime with a cellular phone. In such a situation, where components are used in variable proportions, it is no longer true that the quantities used of the components are unaffected by the individual prices of the components. For example, the initial product may be underpriced, while the aftermarket product is overpriced, relative to the open systems competitive baseline prices. This produces two relevant effects. First, those consumers who use relatively more of the aftermarket product pay more for use of the system as a whole under proprietary systems competition, while less intensive users pay relatively less for the system. Second, consumers will be encouraged to purchase more of the initial product, but then will use it less intensively because of the overpriced aftermarket component.

1. *The Profit Effect of Economic Price Discrimination*

Why would a manufacturer adopt this type of pricing strategy? One possibility is that such a pricing strategy implements a variety of "second-degree economic price discrimination"⁸ that increases

⁸ The traditional classification of the forms of price discrimination was coined by A.C. FIGOU, *THE ECONOMICS OF WELFARE* (1920). *First-degree* price discrimination, or perfect price discrimination, refers to a seller charging a different price for each unit of the good such that the price charged is equal to the buyer's maximum willingness to pay for that unit. *Second-degree* price discrimination refers to non-linear pricing schemes to effect price discrimination. Any pricing schedule in which total expenditure is not equal to a constant multiplied by the quantity purchased is referred to as a non-linear pricing scheme. Examples are quantity discounts, two-part pricing, and certain types of tie-in sales. *Third-degree* price discrimination means that different purchasers are charged different prices, but

profits.⁹ Ind explanation : competition.

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profits.⁹ Indeed, economic price discrimination has been a common explanation for why manufacturers often engage in proprietary systems competition.¹⁰

To illustrate further how second-degree economic price discrimination could work in this context, assume that systems offered in the market are differentiated products and that there are two types of buyers: high users and low users. High users value a particular brand of system more highly than low users and, as a result, purchase more of the aftermarket product than the low users, assuming the same component prices. In open systems competition, the price of each component must be sufficiently high to earn a manufacturer a profit adequate to compensate for all costs and risks related to the manufacture and sale of each component, but no higher than competition among component makers will allow. If products are differentiated, as they normally are, the only market power that a manufacturer can possess is commensurate with whatever competitive advantage that manufacturer has relative to others in producing a particular component. For simplicity, assume that no manufacturer has any advantage in producing the aftermarket product, but some manufacturers have advantages over others in producing the initial product.

In open systems competition, the price of the aftermarket component will be driven to the point where there are no excess profits.¹¹ A manufac-

each purchaser pays a constant amount for each unit of the good purchased. Examples are student discounts or location-based pricing. An important distinction between second-degree and third-degree price discrimination is that in second-degree price discrimination the seller need not be able to distinguish among different classes of users prior to purchase. Rather, buyers self select according to their valuation of the product by the amount purchased, and pay different implied prices as a result. In contrast, in third-degree price discrimination the seller uses some exogenous and observable characteristic, such as age or occupation, in order to distinguish among buyers with different demand characteristics. See, e.g., HAL R. VARIAN, *Price Discrimination in HANDBOOK OF INDUSTRIAL ORGANIZATION* 597 (Richard Schmalensee & Robert D. Willig eds., 1989); DENNIS CARLTON & JEFFREY PERLOFF, *MODERN INDUSTRIAL ORGANIZATION* 459 (1994); JEAN TIROLE, *THE THEORY OF INDUSTRIAL ORGANIZATION* 133 (1988); LOUIS PHILIPS, *THE ECONOMICS OF PRICE DISCRIMINATION* (1981).

⁹ It is accepted economic doctrine that price discrimination increases profits. See, e.g., VARIAN, *supra* note 8, at 611; Walter Oi, *A Disneyland Dilemma: Two Part Tariffs for a Mickey Mouse Monopoly*, 85 Q.J. ECON. 77 (1971); Richard Schmalensee, *Monopolistic Two-Part Pricing Arrangements*, 12 BELL J. ECON. 445 (1981).

¹⁰ See e.g., Aaron Director & Edward Levi, *Law and the Future: Trade Regulation*, 51 Nw. U. L. REV. 281, 290-92 (1956); Ward Bowman, *Tying Arrangements and the Leverage Problem*, 67 YALE L.J. 19, 23-24 (1957); M.L. Burstein, *A Theory of Full-Line Forcing*, 55 Nw. U. L. REV. 62, 64-73 (1960); Benjamin Klein, *Market Power in Antitrust: Economic Analysis After Kodak*, 3 SUP. CT. ECON. REV. 43, 65-71 (1993).

¹¹ Throughout this article we will define "normal" profits to allow for a manufacturer to earn rents on the basis of product differentiation or other competitive advantage. "Excess" profits will refer to profits in excess of this definition of normal profits.

