

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).

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

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 after-market 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-

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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

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.

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. PIGOU, *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 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.

turer of the initial component, which has some pricing flexibility by virtue of its competitive advantage in producing that particular brand of initial component, faces a tradeoff. If it prices the initial component sufficiently high in order to extract a portion of the greater value that high users obtain from use of the product, then the price will be too high for low users and many low users will not purchase the initial product. On the other hand, if it prices the initial product sufficiently low so that low users find the system attractive, the manufacturer must allow high users to purchase the system at a price lower than what it could potentially extract—i.e., lower than the high users' valuation of the system. The optimal price of the initial component is therefore a tradeoff between the profitability from increased extraction of consumer surplus from high users and the lost margins from low users that are priced out of the market. The solution to this optimization problem will depend on (1) the demand elasticities of each group, (2) the cost of producing the initial product, and (3) the relative sizes of the high and low groups.

In contrast, a proprietary systems manufacturer may be able to earn additional profits by utilizing its pricing flexibility to alter component prices while maintaining competitive system prices. The most complete way to extract profits from customers would be to price the aftermarket product at its marginal cost, and then charge high and low users prices for the initial product that reflect their different valuations of the system, given the price of the aftermarket product. This is a type of first-degree price discrimination (which is the opposite of the razor/razor blade strategy) and is theoretically capable of fully extracting all the consumer surplus from use of the system as producer surplus (profits). It is, however, generally impossible to successfully implement such a pricing strategy because it requires the seller to distinguish between high and low users prior to purchase, charge them different prices for the same thing, and then restrict reselling or arbitrage between low and high users. In particular, information about consumer preferences is rarely available. What is required is a process by which consumers "self-select" into the high or low category.

The razor/razor blade strategy does precisely this. By reducing the price of the initial product and then increasing the price of the aftermarket product relative to the baseline prices, low users, who purchase less of the aftermarket product at a given set of prices, pay less for use of the system. As a result, some of them, who would not purchase at all under baseline pricing, find the system cheap enough to use when the initial product is underpriced and little of the overpriced aftermarket products are required. On the other hand, high users, who purchase

more of the aftermarket product, end up paying more for use of the system compared to the open systems baseline pricing.¹² The result is that each group of consumers pays an amount for the system that is roughly correlated with the value they place on use of the system. Accordingly, such a pricing system distinguishes high users from low users through their usage of the aftermarket product.

Enhanced "second-degree economic price discrimination" profits flow from proprietary systems competition partly because there is greater extraction of consumer surplus from high users. That is, high users end up paying more for use of the system than they would under open systems competition baseline prices. However, this extraction of surplus from high users is imperfect, as it generally will be impossible to choose a set of initial and aftermarket product prices such that all consumer surplus is extracted in the form of manufacturer profits.¹³

An additional source of profits, and a benefit to low users, is that the razor/razor blade strategy can increase market participation among low users. That is, low users can end up paying less for use of the system than they would under open systems competition baseline prices, thereby inducing some low users to purchase the system when otherwise they would not have.

2. Welfare Effects of Economic Price Discrimination

What are the welfare effects of second-degree economic price discrimination as implemented through the razor/razor blade strategy? There are three alternative measures of welfare that could be considered: producer surplus (economic profits to manufacturers); consumer surplus; or total welfare (the sum of consumer and producer surplus). It is arguable that the total welfare measure is the most relevant measure for competition policy in high-tech industries. By considering producer surplus as well as consumer surplus, the total welfare measure takes into account the incentive to develop new products that results from enhanced manufacturer profits. At least in rapidly developing technology markets, it is plausible that consumer benefits result in significant part from the introduction of new products, and these dynamic benefits could easily outweigh traditional static efficiency benefits. Maximizing total welfare therefore may be consistent with maximizing long-run consumer surplus. An additional argument in favor of total welfare as a measure

¹² This is the reason for the use of the term "economic price discrimination," even though all users pay the same prices for the individual components.

¹³ See discussion of second degree price discrimination in CARLTON & PERLOFF, *supra* note 8, at 450.

of economic performance in this context is that economic price discrimination may be necessary to produce profits sufficient to support the development and manufacture of new systems.¹⁴

Producer surplus is unambiguously increased under proprietary systems competition with second-degree price discrimination because the manufacturer always has the option of adopting the baseline prices and would only adopt the razor/razor blade strategy when it is more profitable. But the impact on static consumer surplus considered alone is ambiguous. The increase in price to high users extracts some of the consumer surplus from high users. The decrease in price to low users creates additional consumer surplus because additional low users find the product attractive, given the lower price. Depending on (1) the sizes of these groups, (2) the effectiveness with which the price of aftermarket products extracts incremental value, and (3) the responsiveness of new users to decreases in the initial product price, the net effect on consumer surplus can be either positive or negative.¹⁵ In practice, it will be very difficult, if not impossible, to distinguish between instances in which consumer surplus is increased or decreased by the razor/razor blade pricing strategy used to accomplish second-degree price discrimination.

B. IMPERFECT INFORMATION

Relaxing the perfect information assumptions sheds additional light on why manufacturers may adopt a razor/razor blade strategy. There are several different types of information imperfections that can play a role in understanding this type of pricing strategy. The Supreme Court's opinion in *Eastman Kodak v. Image Technical Services, Inc.*¹⁶ has helped frame the issues concerning how imperfect consumer information regarding pricing affects our previous analysis. Imperfect information concerning product quality and the fit between the product's characteristics and particular consumers' needs will have an important impact on any welfare analysis.

¹⁴ See GEORGE STIGLER, *THE THEORY OF PRICE* (1987); Thomas Jorde & David Teece, *Innovation, Dynamic Competition and Antitrust Policy*, 13 REGULATION 35 (1990).

¹⁵ See A. Michael Spence, *Nonlinear Prices and Welfare*, 8 J. PUB. ECON. 1 (1977); John Roberts, *Welfare Implications of Nonlinear Prices*, 89 ECON. J. 66 (1979); Michael Katz, *Nonuniform Pricing, Output and Welfare Under Monopoly*, 50 REV. ECON. STUD. 37 (1983); Jerry Hausmann & Jeffrey Mackie-Mason, *Price Discrimination & Patent Policy*, 19 RAND J. ECON. 253 (1988); CARLTON & PERLOFF, *supra* note 8, at 459-99 (Appendices 15A-15E provide instructive examples).

¹⁶ 504 U.S. 451 (1992) (*Kodak*).

1. Imperfect Consumer Information About Pricing

Imperfect information by consumers regarding aftermarket pricing and the need for aftermarket products was an important focus of the Supreme Court's analysis in *Kodak*. The plaintiffs in *Kodak* were independent service organizations (ISOs) that serviced Kodak copy machines. The ISOs claimed that Kodak was violating Section 2 of the Sherman Act by exploiting consumers in the aftermarket for parts and service for Kodak copiers. Kodak's defense was that it lacked market power because of its low market share in the equipment market for copy machines. Kodak claimed that this fact alone precluded, as a matter of law, a finding that it possessed market power in any relevant market. While the Supreme Court disagreed with this conclusion, it opined that had Kodak adopted a razor/razor blade strategy, its defense might have been stronger:

Kodak could charge subcompetitive prices for equipment and make up the difference with supra-competitive prices for service, resulting in an overall competitive price. This pricing strategy would provide an explanation for [Kodak's] theory's descriptive failings—if Kodak in fact had adopted it. But Kodak never has asserted that it prices its equipment or parts subcompetitively and recoups its profits through service. Instead, it claims that it prices its equipment comparably to its competitors and intends that both its equipment sales and service divisions be profitable.¹⁷

Later in the opinion the Court provided a possible justification for a razor/razor blade approach:

A pricing strategy based on lower equipment prices and higher aftermarket prices could enhance equipment sales by making it easier for the buyer to finance the initial purchase. It is undisputed that competition is enhanced when a firm is able to offer various marketing options, including bundling of support and maintenance service with the sale of equipment. Nor do such actions run afoul of the antitrust laws.¹⁸

In contrast to Kodak's claim that its low market share in the foremarket precluded any consumer harm, the Court held that under some conditions, competition in the foremarket, even when a razor/razor blade strategy is employed, will not protect consumers. The Court focused on three conditions: (1) whether the manufacturer had engaged in a significant policy change that "surprised" the purchaser of the system, (2) whether there were significant "information costs," and (3) whether "switching costs" were high.¹⁹

¹⁷ *Id.* at 472.

¹⁸ *Id.* at 478-79.

¹⁹ PHILLIP AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶1709.2a (1995 Supp.).

In our view, only the first condition provides a proper screen for identifying razor/razor blade strategies that can be used to exploit consumers in the aftermarket, thereby reducing consumer surplus.²⁰ The proper place to focus is on the manufacturer's knowledge. In *Kodak* the Court may have placed undue emphasis on the information available to consumers concerning aftermarket pricing and policies. According to the Court, prevention of aftermarket exploitation requires that "consumers must inform themselves of the total cost of the package—equipment, service, and parts—at the time of the purchase; that is, consumers must engage in accurate life-cycle pricing."²¹ To the contrary, the important issue is not whether consumers can undertake life-cycle pricing, but whether manufacturers understand the relationship between initial product purchases and aftermarket profits.²² If manufacturers know that aftermarket sales generate substantial profits because substantial margins can be earned as a result of customer "lock-in," manufacturers will endeavor to place the initial product in consumers' hands in order to capture the resulting stream of aftermarket profits. Competition among manufacturers will cause the initial product prices to be discounted to reflect this additional benefit. Depending on the degree of systems competition, initial product discounts will rebate all or part of any aftermarket overcharges, whether or not consumers are aware of the consequences of their lock-in.

Moreover, in the case of products sold using a razor/razor blade strategy, it is precisely the consumer's inability to accurately predict the usage of the aftermarket component that can lead to substantial consumer benefits. Take the case of a free cellular phone/expensive per-minute calls combination (as opposed to a flat service charge). An important benefit to the consumer can be that the consumer discovers new uses for the product not imagined at the time of initial purchase. Consumers "learn" the convenience of calling from the road, ordering take-out, or locating a friend who would otherwise be unreachable. In other words, the razor/razor blade strategy allows consumers to discover

²⁰ Because the surprise theory involves the manufacturer charging unexpectedly high prices for the aftermarket product or changing the aftermarket from open to closed, the predominant effect is a transfer of consumer surplus from "locked-in" consumers to manufacturer profits. Nevertheless, by increasing aftermarket prices and decreasing foremarket prices compared to marginal cost there is a small decrease in total welfare. See Severin Borenstein et al., *Antitrust Policy in Aftermarkets*, 63 ANTITRUST L.J. 455 (1995). However, this effect has been demonstrated to be small relative to traditional market power issues. See Carl Shapiro, *Aftermarkets and Consumer Welfare: Making Sense of Kodak*, 63 ANTITRUST L.J. 483 (1995).

²¹ 504 U.S. at 473.

²² See Shapiro, *supra* note 20, at 487-98; Benjamin Klein, *Market Power in Aftermarkets*, 17

the benefits of the product by essentially allowing them to "test drive" the product. Indeed, a razor/razor blade strategy is often adopted by manufacturers of "experience goods" precisely because the consumer must be induced into trying the product to learn all of its benefits.²³

The *Kodak* Court also emphasized the importance of high "switching costs"—that is, the costs of switching from the defendant's equipment to other equipment if the equipment manufacturer tries to extract supra-competitive prices for the components needed for the equipment to function. Clearly, the presence of switching costs is a necessary condition for the possibility of aftermarket exploitation. Without switching costs, any attempt to charge supracompetitive aftermarket prices would fail because consumers would costlessly switch to alternative systems.

The critical situation in which a razor/razor blade strategy might be used as a method to exploit the aftermarket is an unexpected change in the prospects of selling the system. For example, if a manufacturer finds that it faces unexpected diminished expectations of selling the initial products, it will have less incentive to keep aftermarket prices low to avoid losing new customers. In this case, aftermarket prices will increase with no corresponding benefit in initial product pricing. The *Kodak* Court made precisely this point when it averred that aftermarket exploitation depends, in part, on whether "the number of locked-in customers [is] high relative to the number of new purchasers."²⁴

The concern in *Kodak* with a "change in policy" is therefore directly on the mark. Post-*Kodak* lower courts have appropriately spotlighted the change of policy condition. For example, in *Lee v. Life Insurance Co. of North America*,²⁵ the court observed as follows:

[H]ad previous customers known, at the time they bought their Kodak copiers, that Kodak would implement its restrictive parts-serving policy [components], Kodak's "market power," *i.e.*, its leverage to induce customers to purchase Kodak servicing, could only have been as significant as its AEP (appreciable economic power) in the copier [equipment] market, which was stipulated to be inconsequential or nonexistent.²⁶

²³ An experience good is one for which consumers have imperfect information about the appropriateness or value of the product to them prior to purchase. See Richard Nelson, *Information and Consumer Behavior*, 78 J. POL. ECON. 311 (1970).

²⁴ 504 U.S. at 476.

²⁵ 23 F.3d 14 (1st Cir. 1994).

²⁶ *Id.* at 20. See also *PSI Repairs Servs. Inc. v. Honeywell, Inc.* 104 F.3d 811, 820 (6th Cir. 1997) ("we thus hold that an antitrust plaintiff cannot succeed on a *Kodak*-type theory when the defendant has not changed its policy after locking-in some of its customers"); *Digital Equip. Corp. v. Uniq Digital Techs., Inc.*, 73 F.3d 756, 763 (7th Cir. 1996) ("The Court did not doubt in *Kodak* that if spare parts [components] had been bundled with Kodak's copiers [equipment] from the outset, or Kodak had informed customers about

The *Lee* interpretation is correct. The case in which consumer welfare can be increased by allowing aftermarket entry is restricted to situations where an unexpected change in market conditions removes a pre-existing link between aftermarket pricing and initial product sales. Such a case can be distinguished from other cases precisely by the "change in policy" test that most lower courts have now adopted.

2. Imperfect Consumer Information About Product Quality, Suitability, and Support

Consider now the possibility that consumers have less-than-perfect information concerning product quality. As discussed above, this is the typical pre-purchase situation with "experience goods." The lack of consumer information makes the razor/razor blade strategy more beneficial to consumers, contrary to what the Court envisioned in *Kodak*. When consumers have less-than-perfect information about product quality, the razor/razor blade strategy provides valuable information to customers about the product. Or, put another way, the product is improved through the razor/razor blade pricing strategy because the strategy provides greater assurance of product quality or consumer utility prior to purchase.²⁷

its policies before they bought its machines, purchasers could have shopped around for competitive life-cycle prices. The material dispute that called for a trial was whether the *change in policy* enabled Kodak to extract supra-competitive prices from customers who had already purchased its machines.") (emphasis added).

The Court was rightly concerned with a seller who surprises customers with a change in the terms of sale once the customer is locked-in. This should be distinguished from a "surprise" that aftermarket products are required at all. When a firm employs a razor/razor blade strategy, "surprise" regarding the requirement that aftermarket service will be required is difficult. Unlike parts or service, the aftermarket components involved in a razor/razor blade strategy are typically an integral part of the system itself. In at least some cases, consumers are keenly aware that they will require the aftermarket component, usually immediately, and will make either a simultaneous contract for both components prior to any "lock-in," or will take steps to guard against any subsequent price change. The Ninth Circuit made this same observation in *KentMaster Manufacturing Co. v. Jarvis Products Corp.*, 146 F.3d 691 (9th Cir. 1998). The case did not involve a razor/razor blade strategy, but it did involve the sale of complementary products where consumers knew in advance that the use of the product required the aftermarket component. The Ninth Circuit commented that no aftermarket exploitation in this type of situation was possible because:

No rational purchaser would look only at A's price and suppose that he could have A without B. Since A will not work for long without B . . . the rational buyer of A must calculate the cost of B when he makes his initial purchase. . . . [O]nly an idiot would think of the cost of A without taking into account the cost of B.

Id. at 694. The razor/razor blade situation is like the situation analyzed by the Ninth Circuit in that it is obvious in advance that the aftermarket component must be purchased.

²⁷ The point that pricing under the razor/razor blade strategy enhances consumer information and welfare under these conditions is also made in Marius Schwartz & Gregory J. Werden, *A Quality-Signaling Rationale for Aftermarket Tying*, 64 ANTITRUST L.J. 387 (1996):

This information enhancing effect can operate in several different ways. First, if the manufacturer is confident of the quality or the utility of the product, but the customer is skeptical, reducing the initial product price is a method of shifting to the manufacturer some of the risk that the consumer won't like the product. For example, it would not make sense for a manufacturer of a low-quality or less-useful product to sell the initial product unprofitably and then earn small profits in the aftermarket when customers choose not to use it. The extreme case of this phenomenon involves free samples. If consumers do not return to buy after using the free sample, such a strategy cannot possibly be profitable. But, when the manufacturer is confident that the consumer will learn to like and use the product, it can place the initial product in the consumers' hands cheaply. For example, it may pay to give away cellular phones in anticipation that consumers will find that they use them more, and therefore also pay more for usage, than they had originally anticipated. Second, by earning profits in the aftermarket, the manufacturer has an increased incentive to continue to provide service for the initial product and, therefore, consumers have less risk that the manufacturer will withdraw support when initial product sales decline for any reason. For example, purchasers of a particular video game console may be concerned that future upgrades and game cartridges for the product may not continue to be sold, leaving the purchaser stranded without product support. Thus, the welfare effects of an increase in consumer information effected by the razor/razor blade strategy are unambiguously positive. Under these conditions, only sellers of high-quality/high-utility products will pursue the razor/razor blade strategy, and this happens only when consumers prefer high-quality/high-utility products with high priced aftermarket components to low-quality/low-utility products with competitively priced aftermarket products.²⁸

III. LEGAL IMPLICATIONS OF DEFENDING A PROPRIETARY AFTERMARKET

Assuming that a firm embarks on a razor/razor blade strategy, it inevitably will be faced with a series of business decisions concerning the defense of its proprietary aftermarket. Aftermarket entry can have devastating effects on firms in systems markets utilizing a razor/razor blade approach. An aftermarket entrant can cause the manufacturer to lose control over system integrity, and the aftermarket entrant has no

Zhiqi Chen & Thomas Ross, *Refusals to Deal, Price Discrimination and Independent Service Organizations*, 2 J. ECON. & MGMT STRAT. 593 (1993).

²⁸ See Schwartz & Werden, *supra* note 27.

incentive itself to ensure the quality of the overall system.²⁹ And, of course, a successful aftermarket entrant simply can make the razor/razor blade strategy unprofitable. Understandably, manufacturers that benefit from a razor/razor blade strategy will not wish to accommodate the aftermarket entrant and will seek legal and business methods to exclude it. Counsel for a firm protecting its aftermarket will face a thicket of unresolved legal questions that cannot be answered simply by a thorough review of recent "aftermarket" cases. This is because any actions taken to defend a proprietary aftermarket will implicate a variety of antitrust precedent established in non-aftermarket contexts. Moreover, although *Kodak* appeared to endorse the benefits of a razor/razor blade strategy, the Court was silent concerning how far a manufacturer may go in defending such a strategy.

A. PROTECTION THROUGH INTELLECTUAL PROPERTY RIGHTS

The most natural and arguably most effective means of addressing the threat of an aftermarket entrant is to assert intellectual property rights over the system components. If either the initial component or the aftermarket components are protected by patents or copyrights, the manufacturer can seek to exclude the aftermarket entrant on the grounds that the sale or use of the aftermarket entrant's product infringes the manufacturer's intellectual property rights. The aftermarket entrant likely will claim that the refusal by the manufacturer to license a critical patent or copyright establishes the conduct element of a Section 2 monopolization claim. In an appeal following remand in *Kodak*, the Ninth Circuit concluded that the Supreme Court had left the door open for such a response by opining that "intellectual property rights do not confer an absolute immunity from antitrust claims."³⁰

An aftermarket entrant's Section 2 counterclaim in an infringement action raises unresolved legal issues relating to the relationship between the intellectual property laws and the antitrust laws.³¹ Two circuits and a district court in the Third Circuit have recently addressed this issue. In *Data General Corp. v. Grumman Systems Support Corp.*,³² Grumman was

²⁹ For example, aftermarket entrants will not typically ensure system performance even when system failure results from incompatibilities of its product. Consumers will typically look to the equipment manufacturer for warranties in such situations.

³⁰ *Image Technical Servs., Inc. v. Eastman Kodak Co.*, 125 F.3d 1195, 1216 (9th Cir. 1997).

³¹ There has been an historical tension between the antitrust laws and the intellectual property laws. See, e.g., *SCM Corp. v. Xerox Corp.*, 645 F.2d 1195, 1203 (2d Cir.) ("[T]he patent and antitrust laws necessarily clash"); *c.f. Atari Games Corp. v. Nintendo of Am. Inc.*, 897 F.2d 1572, 1577 (Fed. Cir. 1990) ("the two bodies of law are . . . complementary, as both are aimed at encouraging innovation, industry and competition").

³² 36 F.3d 1147, 1187 (1st Cir. 1994).

a third-party service organization that sought to service computers manufactured by Data General. Successful service of Data General's computers required the use of a computer program for which Data General held valid copyrights. Grumman claimed that Data General's refusal to license the critical service program violated Section 2 of the Sherman Act. The First Circuit disagreed. It first concluded: "[W]e hold that while exclusionary conduct can include a monopolist's unilateral refusal to license a copyright, an author's desire to exclude others from use of its copyrighted work is a presumptively valid business justification for any immediate harm to consumers."³³

The First Circuit added in a footnote, "Wary of undermining the Sherman Act, however, we do not hold that an antitrust plaintiff can never rebut this presumption, for there may be rare cases in which imposing antitrust liability is unlikely to frustrate the objectives of the Copyright Act."³⁴ The court ultimately found that Grumman had failed to overcome the presumption.

The Ninth Circuit addressed the identical issue on appeal from the trial in the remanded *Kodak* case in *Image Technical Services, Inc. v. Eastman Kodak Co.*³⁵ One of the issues on appeal was whether *Kodak's* patents on some of its parts and its copyright on its diagnostic software shielded it from any duty to make such parts and software available to the ISOs. After a review of the relevant patent and copyright law, the court faced squarely the same issue that *Data General* addressed with regard to copyrights: can antitrust liability be based "upon a unilateral refusal to deal in a patented or copyrighted product"?³⁶ The Ninth Circuit rejected a per se legal standard, adopting instead the presumption articulated in *Data General*, and concluded that a valid business justification exists whenever action is taken pursuant to a patent or copyright.³⁷ The Ninth Circuit appeared compelled to adopt the presumption rule for patents and copyrights, rather than a per se legality rule, because of language in the Supreme Court's *Kodak* opinion that seemed to suggest that neither a patent nor a copyright can immunize the intellectual property owner from liability when a dominant position is leveraged into additional markets.³⁸ The Ninth Circuit interpreted this language to mean that

³³ *Id.*

³⁴ *Id.* at n.64.

³⁵ 125 F.3d 1195 (9th Cir. 1997).

³⁶ *Id.* at 1216.

³⁷ *Id.* at 1218.

³⁸ Recently, in the *Intel* case, the district court in Alabama has followed the Ninth Circuit holding that "[a] monopolist cannot use the pretext of protecting intellectual property

"intellectual property rights do not confer an absolute immunity from antitrust claims."³⁹ Thus, the Ninth Circuit chose to follow the First Circuit's presumption rule regarding copyrights and patents.

The identical issue again arose in *In re Independent Service Organizations Antitrust Litigation*.⁴⁰ The case came before the district court in a summary judgment posture. The plaintiffs were again independent service organizations that sold repair and maintenance services to users of Xerox copiers. Xerox held several key copier and printer replacement part patents as well as a copyrighted service manual, all of which the ISOs claimed were absolutely required to successfully conduct business. The ISOs conceded the patent infringement, but claimed that Xerox had used its patent rights to monopolize the relevant service market for Xerox machines. The court rejected the presumption rationale articulated in *Data General* and the Ninth Circuit decision in *Kodak*, and held instead that "if a patent is lawfully acquired, a patent holder's unilateral refusal to sell or license its patented invention does not constitute unlawful exclusionary conduct under the antitrust laws even if the refusal impacts competition in more than one relevant market,"⁴¹ and that

if a copyright is lawfully acquired, a copyright holder's unilateral refusal to sell or license its copyrighted expression does not constitute unlawful exclusionary conduct under the antitrust laws or copyright misuse. A copyright holder can exercise its right to exclude others from using the protected expression, even if the exclusion impacts competition in more than one relevant antitrust market.⁴²

Collectively, what these cases mean is that, at least where the protection of proprietary aftermarkets can be shown to provide unambiguous consumer benefits, intellectual property rights will likely provide the necessary protection from aftermarket entrants.

B. PROTECTION THROUGH MARKETING RESPONSES

When intellectual property rights do not provide a sufficient defense against an aftermarket entrant, manufacturers may seek to engage in defensive business strategies to preserve the benefits of the razor/razor blade strategy. Two such strategies are exclusive dealing and exclusionary technical innovation. Under current law, both are subject to attack by the aftermarket entrant as violative of the antitrust laws. In both these

in order to violate the antitrust laws." *Intergraph Corp. v. Intel Corp.*, 3 F. Supp. 2d 1255, 1279 (N.D. Ala. 1998).

³⁹ *Id.* at 1216.

⁴⁰ 989 F. Supp. 1131 (D. Kan. 1997).

⁴¹ *Id.* at 1139.

⁴² *Id.* at 1144.

areas the antitrust law is unsettled when applied to a situation involving defense of a proprietary aftermarket. Manufacturers, however, can take advantage of a trend among recent cases that emphasizes a competitive effects analysis as opposed to reliance on doctrinaire rules.

1. Exclusive Dealing

Exclusive dealing is a natural response to an aftermarket entrant. Since consumers are typically not well informed about alternative high-tech systems, proprietary systems competition will often involve rivalry based on brand name recognition. As a result, system producers usually advertise the benefits of their particular systems. Because the system's value only can be consumed when all of the system components are present, advertising rarely focuses on the individual components themselves. But where a razor/razor blade strategy is employed, investment in advertising is only recouped in the aftermarket. This creates a powerful incentive for a potential entrant to free ride in the distribution channels handling the manufacturer's system. A natural response by the manufacturer is to enter into exclusive relationships with system distributors for the sale of components.

The key issue for manufacturers defending a proprietary aftermarket through exclusive dealing will be whether the applicable law of the circuit allows the manufacturer to effectively overcome a showing of foreclosure by demonstrating the consumer benefits of its business strategy. In other words, the issue is whether, at high levels of foreclosure, the manufacturer can defend the exclusivity on the ground that proprietary systems competition yields greater consumer benefits than open systems competition.

The early law of exclusive dealing would have given the manufacturer little defense against an action for exclusive dealing brought by an aftermarket entrant. In *Standard Oil Co. v. United States*,⁴³ a full-blown rule of reason analysis was not available because

To insist upon such an investigation would be to stultify the force of Congress' declaration that requirements contracts are to be prohibited wherever their effect "may be" to substantially lessen competition. . . . We conclude, therefore, that the qualifying clause of Section 3 [of the Clayton Act] is satisfied by proof that competition has been foreclosed in a substantial share of the line of commerce affected.⁴⁴

Under this so-called "quantitative substantiality test," the aftermarket entrant would need only to demonstrate the existence of foreclosure in

⁴³ 337 U.S. 293 (1949) (*Standard Stations*).

⁴⁴ *Id.* at 313-14.

the distribution channel, and no effective competitive effects defense would be possible.⁴⁵

In 1961 the Supreme Court revisited the issue of exclusive dealing in *Tampa Electric Co. v. Nashville Coal Co.*⁴⁶ The Court rejected the quantitative substantiality test advocated by the *Standard Stations* Court and instead adopted what has come to be known as the "qualitative substantiality" test.⁴⁷ The Court summarized its guidelines for analyzing exclusive dealing arrangements as follows: "First, the line of commerce . . . involved must be determined. . . . Second, the area of effective competition in the known line of commerce must be charted. . . . Third, and last, the competition foreclosed by the contract must be found to constitute a substantial share of the relevant market."⁴⁸ The requirement of defining the relevant market was a critical advance.⁴⁹ In the razor/razor blade context, *Tampa's* market requirement forces a plaintiff to define a relevant market composed of the aftermarket component alone. This is because exclusive dealing in system components does not foreclose competing systems, only aftermarket component entrants. In fact, the issue of the competitive effects or consumer benefits deriving from a razor/razor blade strategy is coextensive with the issue of whether there is a relevant market in the aftermarket components for use in a system. As expressed by the Court in *Kodak*: "Whether considered in the conceptual category of 'market definition' or 'market power,' the ultimate inquiry is the same—whether competition in the equipment market will significantly restrain power in the service and parts markets."⁵⁰

⁴⁵ In the *Standard Stations* case, the Court struck down Standard Oil's use of exclusive dealing contracts as a "potential clog on competition," even though, according to the Court, only 6.7% of the total gross business was affected.

⁴⁶ 365 U.S. 320 (1961) (*Tampa*).

⁴⁷ The Court in *Tampa* was analyzing a requirements contract between an electric utility and a coal company that had a 20-year term and involved approximately \$128 million of coal sales. The Court held that the relevant market to be analyzed was the coal market in approximately seven states. The coal subject to the requirements contract was found to be approximately 0.77% of that market.

⁴⁸ *Id.* at 327-28.

⁴⁹ See *Queen City Pizza, Inc. v. Domino's Pizza, Inc.*, 124 F.3d 430 (3d Cir. 1997) (dismissing an exclusive dealing action for failure to define the relevant market).

⁵⁰ 304 U.S. at 469-70 n.15. The *Tampa* Court further held that a competitive effects analysis is required that includes consideration of "the probable effect of the contract on the relevant area of effective competition, taking into account the relative strength of the parties, the proportionate volume of commerce involved in relation to the total volume of commerce in the relevant market area, and the probable immediate and future effects which pre-emption of that share of the market might have on effective competition therein." 365 U.S. at 329. The last element in the *Tampa* test further opens the door to the manufacturer's argument that foreclosure of the aftermarket entrant in the aftermarket case can have a positive effect on competition.

*Jefferson Parish Hospital District No. 2 v. Hyde*⁵¹ may have increased the importance of a competitive effects analysis when analyzing an exclusive dealing contract. While not addressed by the majority opinion, the issue was discussed in Justice O'Connor's concurrence: "Whether or not the Hospital-Roux contract is characterized as a tie between distinct products, the contract unquestionably does constitute exclusive dealing. Exclusive dealing arrangements are independently subject to scrutiny under Section 1 of the Sherman Act, and are also analyzed under the Rule of Reason."⁵² Justice O'Connor then states that "[e]xclusive dealing arrangements may, in some circumstances, create or extend market power of a supplier or the purchaser party to the exclusive dealing arrangement,"⁵³ and thus may restrain horizontal competition. Under the rationale of the *Jefferson Parish* concurrence, a dispute between a systems manufacturer and an aftermarket entrant would require the aftermarket entrant to demonstrate either a significant impact on the systems market or a relevant market in the aftermarket component, and both of these demonstrations necessarily would require an analysis of the issues discussed above.

In his typical style, Judge Posner, on the heels of *Jefferson Parish*, cut right to the point in *Roland Machinery Co. v. Dresser Industries*:⁵⁴

The exclusion of competitors is cause for antitrust concern only if it impairs the health of the competitive process itself. Hence, a plaintiff must prove two things to show that an exclusive dealing arrangement is unreasonable. First, he must prove that it is likely to keep at least one significant competitor of the defendant from doing business in a relevant market. If there is no exclusion of a significant competitor, the agreement cannot possibly harm competition. Second, he must prove that the probable (not certain) effect of the exclusion will be to raise prices above (and therefore reduce output below) the competitive level, or otherwise injure competition; he must show in other words that the anticompetitive effects (if any) of the exclusion outweighs any benefits to competition from it.⁵⁵

More recently, several lower courts explicitly have given prominence to a competitive effects analysis in exclusive dealing cases through full-blown rule of reason analyses. For example, in *Acton v. Merle Norman Cosmetics Inc.*⁵⁶ the district court introduced its analysis of an exclusive dealing arrangement by stating that "[v]ertical non-price restraints of

⁵¹ 466 U.S. 2 (1984).

⁵² *Id.* at 44-45.

⁵³ *Id.* at 45.

⁵⁴ 749 F.2d 380 (7th Cir. 1984).

⁵⁵ *Id.* at 394 (citation omitted).

⁵⁶ 1995-1 Trade Cas. (CCH) ¶ 71,025 (C.D. Cal.).

the type at issue in this case are subject to a Rule of Reason analysis."⁵⁷ Citing the Ninth Circuit's opinion in *Thurman Industries v. Pay 'N Pac Stores, Inc.*,⁵⁸ the district court stated that "in order to prove injury to competition as required by the rule of reason, plaintiffs must prove the relevant product and geographic markets, and demonstrate the effects of the alleged restraints within those markets."⁵⁹ Then, combining the three-part test in *Tampa* with the traditional requirements of a rule of reason analysis, the court concluded that "[t]o condemn exclusive dealing arrangements after *Tampa* requires a detailed depiction of circumstances and the most careful weighing of alleged dangers and potential benefits, which is to say the normal treatment afforded by the rule of reason."⁶⁰

A similar approach can be found in *Ryko Manufacturing Co. v. Eden Services*.⁶¹ Extrapolating from *Tampa*, the Eighth Circuit held that the proper "test requires us to examine the character of the relevant market and to assess the competitive impact of the alleged constraints."⁶² According to the court, where "the supplier imposing the provisions has substantial market power, we may rely on the foreclosure rate alone to establish the violation."⁶³ Moreover, "the plaintiff must show that the restraint . . . has a probable adverse affect on interbrand competition."⁶⁴

Thus, several lower courts recently have interpreted Supreme Court law to require that a plaintiff alleging exclusive dealing demonstrate an anticompetitive effect in a relevant market. In the case of an aftermarket entrant, this is only possible if the aftermarket entrant can prove that under the particular factual situation at issue consumer benefits will be greater in open system competition than in proprietary system competition.

Several exclusive dealing cases in the health care area have achieved a similar result by focusing on the antitrust injury requirement. In *Balaklaw v. Lovell*,⁶⁵ the Second Circuit upheld summary judgment in

⁵⁷ *Id.* at 74,818.

⁵⁸ 875 F.2d 1369, 1373 (9th Cir. 1989).

⁵⁹ 1995-1 Trade Cas. (CCH) ¶ 71,025 at 74,818. See also *Kaplin v. Burroughs Corp.*, 611 F.2d 286, 291 (9th Cir. 1979) (proof that the defendant's activities had an impact upon competition in a relevant market is an absolutely essential element of a rule of reason case).

⁶⁰ 1995-1 Trade Cas. (CCH) ¶ 71,025 at 74,819.

⁶¹ 823 F.2d 1215 (8th Cir. 1987).

⁶² *Id.* at 1233.

⁶³ *Id.*

⁶⁴ *Id.* at 1234; see also *Queen City Pizza, Inc. v. Domino's Pizza, Inc.*, 124 F.3d 430 (3d Cir. 1997).

⁶⁵ 14 F.3d 793 (2d Cir. 1994).

favor of a defendant in an exclusive dealing case after concluding that the plaintiff failed to demonstrate the existence of antitrust injury. The court determined that "[t]he relevant markets even arguably affected by the exclusive contract granted to Dr. King and his group are (1) the consumers of anesthesiology services, and (2) the providers of anesthesiology services."⁶⁶ The court then went on to determine that neither consumers nor other providers of anesthesiology services were injured by the exclusive dealing arrangement. As in the rule of reason approach, focusing on antitrust injury forces a plaintiff to demonstrate that the exclusive dealing had negative competitive effects in a relevant market. The same approach was taken by the Fourth Circuit in *Thompson Everett, Inc. v. National Cable Advertising*,⁶⁷ which analyzed exclusive cable television representation arrangements and upheld a district court grant of summary judgment for the defendant on the grounds that the plaintiff failed to show that it had suffered antitrust injury as a result of the agreement.⁶⁸

The law of exclusive dealing appears to be evolving in the direction of requiring a full-blown competitive effects analysis. If so, manufacturers defending a razor/razor blade strategy should be in a position to make powerful consumer welfare arguments in favor of proprietary aftermarkets.

2. Exclusionary Innovation

A second natural business response to an aftermarket entrant is to redesign the system's technology so that the aftermarket entrant's product either no longer works or is no longer desirable to the consumer. The case law is clear that a manufacturer has no duty to aid the

⁶⁶ *Id.* at 798.

⁶⁷ 57 F.3d 1317 (4th Cir. 1995).

⁶⁸ The manufacturer in an exclusive dealing case is further benefited by the fact that lower courts that have not explicitly required a competitive effects analysis have set other high hurdles for a plaintiff to overcome. For example, in *Omega Envtl., Inc. v. Gilbarco Inc.*, 127 F.3d 1157 (9th Cir. 1997), the Ninth Circuit makes no mention of competitive effects, yet provides a laundry list of factors that must be taken into account before a jury can reasonably conclude that any foreclosure is significant. Such factors include other avenues to sell the product, such as direct sales to end users, or alternative distributors. One factor stressed by the court was "the short duration and easy terminability of [the] agreements," *id.* at 1163, because foreclosure cannot be effective if competitors are free to induce distributors away. See also *Paddock Publications, Inc. v. Chicago Tribune Co.*, 103 F.3d 42 (7th Cir. 1996); *U.S. Healthcare, Inc. v. Healthsource, Inc.*, 986 F.2d 589 (1st Cir. 1993). Because the Ninth Circuit did not explicitly call for a competitive effects analysis, it was difficult for the manufacturer to defend its actions on the basis of an absence of a relevant market in the aftermarket component. On the other hand, the Ninth Circuit presented a stringent test for *any* plaintiff to satisfy when challenging an exclusive dealing arrangement.

aftermarket entrant. In *Berkey Photo, Inc. v. Eastman Kodak Co.*⁶⁹ the plaintiff, Berkey, complained that the launching of the Kodacolor II system in 1972 "constituted an impermissible leveraging of Kodak's film monopoly into the two photofinishing markets, services and equipment."⁷⁰ The success of Kodacolor II required the use of a new type of film manufactured by Kodak as well as new photofinishing techniques. According to Berkey, rival camera producers and developers could only compete to the extent that Kodak made the new Kodak film available to them. Berkey urged the court to adopt a duty of predisclosure whenever technological changes potentially could disadvantage rivals. The court declined, holding that "[e]nforced predisclosure would cause undesirable consequences beyond merely encouraging the sluggishness the Sherman Act was designed to prevent" and that, accordingly, "Kodak did not have a duty to predisclose information about the 110 system to competing camera manufacturers."⁷¹

While a manufacturer has no duty to aid a competitor, a manufacturer does not have unfettered discretion to impede a competitor through technological innovation. The prevailing rule of law appears to be that only design changes that can be justified by either improvements in quality or reductions in cost will pass muster under the Sherman Act where such changes impede a competitor's ability to compete. In *ILC Peripherals Leasing Corp. v. IBM*,⁷² the plaintiff Memorex claimed that an innovation to IBM's 2391A computer interface "assure[d] that the first three drives attached to the central processing unit were IBM drives."⁷³ IBM argued that the interface change "was based on sound engineering considerations, and led to the introduction of a better product at a lower price."⁷⁴ While Memorex conceded that the change was a beneficial innovation, it argued that there were other methods of achieving the same result that would not have excluded Memorex. Nevertheless, the court held that "[w]here there is a difference of opinion as to the advantages of two alternatives which can both be defended from an engineering standpoint, the court will not allow itself to be enmeshed 'in a technical inquiry into the justifiability of product innovations.'"⁷⁵

⁶⁹ 603 F.2d 263 (2d Cir. 1979).

⁷⁰ *Id.* at 278.

⁷¹ *Id.* at 281; see also Joseph Sikak, *Debunking Predatory Innovation*, 83 COLUM. L. REV. 1121 (1983).

⁷² 458 F. Supp. 423 (N.D. Cal. 1978), *aff'd sub nom.* Memorex Corp. v. IBM, 636 F.2d 1188 (9th Cir. 1980) (per curiam).

⁷³ *Id.* at 438.

⁷⁴ *Id.*

⁷⁵ *Id.* at 438.

California Computer Products v. IBM,⁷⁶ presented essentially the same fact scenario as *ILC Peripherals*. Like Memorex, California Computer Products (CalComp) was a computer peripheral producer of equipment such as disks, tapes, printers, and terminals that connected to IBM computers. According to the Ninth Circuit, "[b]y the reverse engineering of simply buying a device from IBM, taking it apart, and building a similar one, CalComp was able to avoid IBM's expenditures for research and development and pass the savings on through lower prices."⁷⁷ IBM countered in 1970 with the introduction of its System 370 Model 145, which integrated the disk drive function directly into the CPU, making "the interface between the disk drive and its control function . . . different from earlier models."⁷⁸ CalComp argued that it was disadvantaged as a result of these design changes and that their purpose was simply to monopolize the relevant market for peripherals. "The evidence at trial was uncontroverted that integration was a cost-saving step, consistent with industry trends, which enabled IBM effectively to reduce prices for equivalent functions."⁷⁹ As a result, the Ninth Circuit held that "IBM, assuming it was a monopolist, had the right to redesign its products to make them more attractive to buyers whether by reason of lowering manufacturing cost and price or improved performance,"⁸⁰ even if it meant the exclusion of peripheral rivals. Two years later, in *Memorex Corp. v. IBM*,⁸¹ the Ninth Circuit upheld a directed verdict in favor of IBM because the case "presented substantially the same issues and much of the same evidence"⁸² as the *California Computer Products* case.

Subsequently, a similar issue arose in *Foremost Pro Color, Inc. v. Eastman Kodak Co.*⁸³ Although *Foremost* involved essentially the same type of fact pattern as the IBM computer peripherals cases, the plaintiff in *Foremost* characterized the technological incompatibilities built into Kodak's 110 system (released in 1972) as a tie involving cameras and film. Nonetheless, the Ninth Circuit, quoting *California Computer Products*, held that Kodak "had the right to redesign its products to make them more attractive to buyers—whether by reason of lower manufacturing cost and price or improved performance"⁸⁴ and, moreover, "[t]he antitrust laws did not impose a duty on Kodak to assist Foremost, other photofinishers, or

⁷⁶ 613 F.2d 727 (9th Cir. 1979).

⁷⁷ *Id.* at 731.

⁷⁸ *Id.* at 743.

⁷⁹ *Id.* at 744.

⁸⁰ *Id.*

⁸¹ 636 F.2d 1188 (9th Cir. 1981).

⁸² *Id.*

⁸³ 703 F.2d 534 (9th Cir. 1983).

manufacturers of competing cameras, film, paper or chemicals to 'survive or expand.'"⁸⁵

These cases suggest that a manufacturer facing imminent entry in the aftermarket for its components has no duty to aid entrants and can make technological changes that exclude the aftermarket entrant when such innovations either improve product performance or reduce cost or price.

But what if the manufacturer simply wants to defend its razor/razor blade strategy and exclude the aftermarket entrant through a technological innovation that does not lower cost or improve product quality? What if the sole purpose of the technological innovation is simply to exclude the aftermarket entrant in order to maintain the consumer benefits attendant with the razor/razor blade pricing strategy? Here, the case law is less clear. A few cases suggest that the test for predatory innovation should include a full anticompetitive effects analysis. In *In re IBM Peripheral EDP Devices Antitrust Litigation*,⁸⁶ the district court analyzed a claim that IBM's redesign of the interface between its CPU and its tape drive systems rendering alternative peripheral producers incompatible with IBM's CPUs was predatory innovation and a violation of the Sherman Act. The district court acknowledged that there are "situations where a monopolist could utilize the design of its own product to maintain market control or to gain a competitive advantage,"⁸⁷ and stated:

If the design choice is unreasonably restrictive of competition, the monopolist's conduct violates the Sherman Act. This standard will allow the factfinder to consider the effects of the design on competitors; the effects of the design on consumers; the degree to which the design was the product of desirable technological creativity; and the monopolist's intent, since a contemporaneous evaluation by the actor should be helpful to the factfinder in determining the effects of a technological change.⁸⁸

The suggestion that consumer welfare should be a probative factor in the analysis opens the door to the manufacturer's argument that its exclusionary innovation protects a procompetitive strategy that benefits consumers and the competitive process. Unfortunately, on appeal the Ninth Circuit ignored the district court's introduction of a competitive effects analysis, upholding the decision but characterizing the district court holding as merely "finding that the contested changes were improvements in the product."⁸⁹

⁸⁵ *Id.*

⁸⁶ 481 F. Supp. 965 (N.D. Cal. 1979), *aff'd sub nom.* *Transamerica Computer Co. v. IBM*, 698 F.2d 1377 (9th Cir. 1983).

⁸⁷ *Id.* at 1002.

⁸⁸ *Id.* at 1003 (citation omitted).

Finally, in *Multistate Legal Studies, Inc. v. Harcourt Brace Jovanovich*,⁹⁰ the Tenth Circuit, commenting on previous authority regarding predatory innovations, stated that "[b]oth the purpose and results of a product change, including customers' reception of the change, are relevant to whether a claimed product improvement is pro- or anticompetitive."⁹¹ Arguably, this language goes further than previous cases, as the "results" of the innovation clearly depend on whether there are consumer benefits that result from the innovation.

Thus, while the case law on predatory innovation is less explicit than the law of exclusive dealing concerning the ability to effectively introduce a competitive effects analysis, more recent cases concerning design changes may support the ability of the manufacturer to argue that a product innovation specifically designed to exclude an aftermarket entrant is procompetitive and does not violate the antitrust laws.⁹²

IV. CONCLUSION

As technologies become more sophisticated, economic theory has been forced to tackle new issues, such as network externalities, industry standard setting, and systems competition. We have attempted to analyze one type of business strategy, the razor/razor blade strategy, that is being adopted by many high-tech companies selling integrated systems. Because of the incentives created for aftermarket entry, the razor/razor blade strategy typically involves defending a proprietary aftermarket. From an economic point of view, in most cases the razor/razor blade strategy with a proprietary aftermarket may offer significant consumer benefits. Moreover, *Kodak* and the cases interpreting *Kodak* provide an effective screen to ferret out the limited situations in which a razor/razor blade strategy could harm consumers. Such thinking runs counter to the instincts of most antitrust professionals because it means that "exclusion" of an entrant can be beneficial to competition. Current antitrust case law does not yet explicitly allow manufacturers to defend a proprietary aftermarket. But, as we have argued, the antitrust case law seems to be advancing in this direction.

⁹⁰ 63 F.3d 1540 (10th Cir. 1995).

⁹¹ *Id.* at 1551; *see also* *Telex Corp. v. IBM*, 510 F.2d 894 (10th Cir. 1975).

⁹² A current case that addresses the same issues is *Hewlett-Packard Co. v. Nu-Kote International, Inc.*, No. C-94-20647 (N.D. Cal.). In that case, Nu-Kote has counterclaimed that Hewlett-Packard altered the design of its ink cartridges in order to make Nu-Kote's ink-refilling tool incompatible, rather than as a product improvement. Thus far, the plaintiff