

# **Links Between Vertically Related Markets: Kodak (1997)**

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**Abstract:** In 1987 seventeen small companies filed an antitrust lawsuit against the Eastman Kodak Corporation, alleging that Kodak used its monopoly power over repair parts for its high-volume copiers and micrographics equipment in order to monopolize the service markets for those machines. Fifteen years later, there have been two District Court opinions, two from the Ninth Circuit Court of Appeals, and one from the Supreme Court. Since the initial Supreme Court opinion in *Kodak*, there have been at least seven closely related Appeals Court opinions, and they stand in sharply divided conflict on the question of market power in aftermarkets.. After the final appeal decision, another area of controversy and conflict between courts has emerged on the extent to which antitrust law restricts the use of protected intellectual property. *Kodak* is one of the most significant antitrust cases of the last decade or two, and one of the most controversial. We review the facts and the procedural history. We then present the main economic issues in dispute, and summarize the evidence presented at trial. We close with brief observations on some unresolved questions that affect future antitrust economic analysis, and describe two post-*Kodak* conflicts among other Circuit Courts of Appeal.

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## Links between vertically related markets: Kodak (1997)<sup>1</sup>

*“The difficulty of obtaining parts, technical information and diagnostic software has effectively kept 3<sup>rd</sup> party service suppliers out of the advanced equipment service market”*<sup>2</sup>

*“Both IBM and Xerox will sell spare parts, but we do not. This makes it more difficult for a third party to service our copiers.”*<sup>3</sup>

### INTRODUCTION

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In 1987 seventeen small companies filed an antitrust lawsuit against the Eastman Kodak Corporation (“Kodak”). These companies, several of them literally “mom and pop” operations, had been trying to compete with Kodak for contracts to provide maintenance service to end customers who owned expensive, durable Kodak photocopier or micrographics equipment. Eleven years later, there had been two District Court opinions, two from the Ninth Circuit Court of Appeals, and one from the Supreme Court. Kodak appealed its guilty verdict to the Supreme Court one last time, but the Court refused to hear the appeal, and the case finally ended in 1998.. Entire conferences have been devoted to the antitrust economics issues raised by *Kodak*, and numerous articles have been published in both legal and economics scholarly journals. Since the initial Supreme Court opinion in *Kodak*, there have been many closely related Appeals Court opinions, and they stand in sharply divided conflict on at least two issues. *Kodak* is one of the most significant antitrust cases of the last decade or two. It is also one of the most controversial, and the controversy is far from resolved.

In this chapter we report on the history and status of *Kodak*. We focus on the economic issues. Although there is still sharp disagreement on the antitrust *policy* that should be followed in response to the economic issues, there is now a fairly broad agreement about the structure, assumptions and results of the basic economic theories; remaining disagreements are largely about the facts specific to Kodak’s situation. After summarizing the relevant factual and procedural background, we describe the theories. We then describe the economic analyses presented by the parties in court. We close by discussing several issues in the law and economics of antitrust that *Kodak* raises, but which have implications far beyond cases about durable equipment and maintenance.

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<sup>1</sup> MacKie-Mason was expert economist for the plaintiffs on liability issues, and testified at trial. Metzler assisted in the economic analysis.

<sup>2</sup> Trial Exhibit (hereafter, “Exh.”) 99 at 6762, a Kodak report on micrographic service.

<sup>3</sup> Exh. 649 at 1315-1316, a Kodak internal document.

## MARKET BACKGROUND<sup>4</sup>

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This case concerned Kodak practices relating to parts for, and maintenance service on, micrographic equipment and high volume copiers. These machines are “durable” goods: goods that are purchased with the expectation of gaining utility from them for an extended period of time. (“Consumption” goods are purchased for the one-time utility that they provide.) Many durable goods, perhaps most, require ongoing maintenance for continued utility. For example, a copier with a burned-out light bulb generates little utility beyond that of an ordinary countertop.

Specialized terms have been developed to describe the markets in which these goods are sold. Consider a car, as an example: because the utility derived from the car is what brings consumers into these markets, the market in which the car is sold is the “foremarket” or “primary” market. Demand for maintenance is composed entirely of consumers of the primary market good: consumers don’t demand brake service if they don’t own a car. Therefore, we refer to the market for maintenance goods as the “aftermarket”.<sup>5</sup>

### **Micrographics**

Micrographics equipment is used for creating, filing, retrieving, viewing, and printing microforms. Microforms include microfiche, microfilm (for example, with back issues of *The New York Times*), and, for secret agents, microdots. These are variations on the same basic idea: using optics and fine-grained film, it is possible to expose an image of printed matter onto film at a greatly reduced size, thereby reducing storage space. With another set of optics, the film image can be enlarged to the original size, then viewed or printed.<sup>6</sup>

Kodak invented this process in the late 1920s. Over the last 70 years, micrographics equipment has developed to encompass cameras, film processors, film duplicators, readers (enlarge microfilm for viewing or printing), COM (computer output to microfilm, devices that “print” to microfilm rather than paper), CAR (computer automated retrieval, largely software/hardware combinations to automate handling large libraries of microfilm). Kodak remained a significant manufacturer and seller in most of these equipment categories.

### **Photocopiers**

Kodak began manufacturing and selling high-volume photocopiers in the mid-1970’s. These are large machines, weighing hundreds of pounds and generally selling for tens of

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<sup>4</sup> The first three subsections summarize a large number of facts. We believe it is fair to represent these as the undisputed facts, though of course almost no presentation of facts in a case is completely undisputed. In the interest of space, however, we do not provide specific citations to the trial evidence to support most of these background facts. When the trial evidence is summarized in Section 0, we provide citations.

<sup>5</sup> Fore- and aftermarkets do not exist only for equipment and maintenance. For example, we could have a computer operating systems foremarket and application program aftermarkets.

<sup>6</sup> We use the present tense to discuss the technologies in this case, but we are referring to technologies current as of the issues in the case, covering approximately the years 1980-95.

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thousands of dollars. High-volume photocopiers can handle from 60,000 to over one million copies per month.

### **Maintenance**

Both copiers and micrographic equipment require extensive, ongoing maintenance, consisting of service labor and parts. In this case, essentially all maintenance calls included a service component and many, perhaps most required parts as well. Labor and parts are not required in fixed proportions. Among other things, they can vary due to the choice between part repair and replacement, and the use of preventative maintenance.

Kodak established a national network of service technicians to provide maintenance on its copiers, and another technician network for maintenance of its micrographics equipment. Kodak advertised the quality of its maintenance.

By the early 1980's, there were many, small independent service organizations (ISOs) providing maintenance on Kodak micrographic equipment. There were a few ISOs servicing Kodak photocopiers. These ISOs typically provided maintenance at prices 15%-30% below Kodak. They provided service generally of the same quality as Kodak's'. They at times provided customized maintenance options Kodak would not provide.

### **The "Parts Policy"**

In 1995 Image Technical Services (ITS) had won a large contract from the Computer Service Corporation (CSC) for micrographics maintenance. Kodak had been servicing CSC's equipment for about \$200,000 per year with a 4-hour guaranteed response time. ITS submitted a bid of \$150,000 with the same 4-hour response time guarantee. Kodak countered by lowering its bid \$135,000. ITS came back with a bid of \$100,000 and agreed to put a service technician on-site full time.

Shortly thereafter, Kodak instituted a policy of no longer selling parts for either copier or newly introduced micrographics equipment to ISOs.<sup>7</sup> This was clearly a change in practice for micrographics. Kodak had previously sold parts to anyone who ordered them and seemed to support the small ISOs. Kodak agreed that this was a change in policy, but claimed that the policy applied only prospectively: Kodak would only refuse to sell parts for equipment models introduced after the policy was announced.

It is not clear whether the change in *practice* on copier parts sales was also a change in policy. Kodak had previously sold copier parts to some ISOs and had referred the ISOs to Kodak's in-house technician help line for assistance. Kodak claimed such sales were unintentional.

Over time, Kodak increasingly policed its no-parts sales policy. It began tracking parts sales to ensure that equipment owners were not purchasing more than they would reasonably need for the equipment they owned. Kodak required prospective parts purchasers to provide proof of ownership of the equipment model for which they were

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<sup>7</sup> The record is not clear on whether the policy was implemented in 1985 or 1986. It was not much enforced, if at all, prior to mid-1986.

ordering parts. It additionally required, for copier parts, certification that the customer had a Kodak-trained employee to effect the repairs. Kodak also required customers to agree to not resell parts.

## PROCEDURAL HISTORY

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### **The Initial Case, and the Motion for Summary Judgment**

In April 1987, ITS and several other ISOs filed suit against Kodak in the District Court, Northern District of California. The suit alleged that Kodak used its monopoly over parts to monopolize the service markets for its copiers and micrographics equipment; and that Kodak had conspired with its outside parts suppliers to preclude ISO access to parts, thereby monopolizing the service market; and that Kodak had tied its service labor to parts, thereby harming competition in the service market. These actions were alleged to violate Sections 1 and 2 of the Sherman Act.

Very early in the fact-finding process, Kodak moved for “summary judgment”.<sup>8</sup> Kodak argued there was no allegation that it had market power in the equipment markets. Kodak claimed that equipment consumers had many alternatives available to them and made purchase decisions based on the total cost of ownership,<sup>9</sup> and thus any attempt by Kodak to extract higher profits from maintenance customers would result in equipment customers taking their business elsewhere. Thus, because it could not have service market power, Kodak argued that as a matter of law it could not be found guilty of tying or monopolizing service markets. The judge agreed, and granted summary judgment.<sup>10</sup>

The ISOs appealed to the Ninth Circuit Court of Appeals, claiming that Kodak’s arguments were purely theoretical. Various market imperfections could break the link between higher aftermarket prices and reduced foremarket sales, preventing foremarket competition from sufficiently disciplining aftermarket market power. The Ninth Circuit granted the appeal, overturned the summary judgment order and remanded the case for trial.<sup>11</sup>

Kodak appealed to the Supreme Court, which ruled in 1992. The Court agreed with the Ninth Circuit, and remanded the case for trial in district court.<sup>12</sup>

It is important to recognize the Supreme Court did *not* find that Kodak had illegally monopolized or tied. Nor did it find that parts or service were necessarily relevant markets. The Supreme Court found only that Kodak had not carried its burden

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<sup>8</sup> “Summary judgment” is granted when the Court is persuaded that, even if all disputed facts are resolved in favor of the non-moving party, the non-moving party cannot, as a matter of law, win the case. Essentially, it is a way to avoid wasting Court resources.

<sup>9</sup> “Total cost of ownership” is the present discounted (expected) value of all costs associated with owning and using the machine, including future maintenance costs. This is also called “life cycle” analysis.

<sup>10</sup> 1988 WL 156332 (N.D. Cal.)

<sup>11</sup> 903 F.2d 612 (9<sup>th</sup> Cir. 1990)

<sup>12</sup> 504 U.S. 451 (1992)

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of proof for summary judgment. Kodak had failed to convince the Court economic theory proved that it was impossible for Kodak to be guilty. Rather, the Supreme Court concluded that the ISO's economic theories were plausible, and that Kodak's guilt or innocence hinged on the interpretation of the *facts* in the case: a trial would be required.

### The Trial

On June 19, 1995, the jury trial of *ITS v. Kodak* began in District Court. The trial involved 63 witnesses giving 27 days of testimony. At the close of evidence, the plaintiffs dropped the tying claims. Therefore, the only claims presented to the jury were that Kodak had monopolized the service markets for its high-volume copies and micrographics equipment. The alleged monopolizing acts were the restrictive parts policies, which leveraged Kodak's parts monopolies into service monopolies. The jury deliberated for 13 days and returned a unanimous guilty verdict. Kodak was held liable for \$24 million in damages, trebled to \$72 million. On February 15, 1996, the district court issued a 10-year injunction requiring Kodak to sell parts to ISOs at non-discriminatory prices.<sup>13</sup>

Kodak appealed to the Ninth Circuit Court of Appeals with three interesting economic points: Can Kodak be required to sell patented parts and copyrighted service software and manuals? Can "all Kodak parts" be a relevant market, despite the lack of substitutability between two different parts? Can a firm be convicted of monopolizing its *aftermarkets* without first being found to have obtained supracompetitive *systems* profits or prices?

On August 26, 1997, the Ninth Circuit ruled. The Court rejected these three Kodak arguments and upheld the plaintiffs' verdict on all liability issues.<sup>14</sup>

## ECONOMICS OF AFTERMARKET MARKET POWER

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The central economic feature of *Kodak* was the dispute over theories of market power in aftermarkets. Kodak argued before the Supreme Court that primary market competition, as a matter of economic theory, precludes anticompetitive aftermarket actions. After the Supreme Court rejected this argument, Kodak argued at trial that the *presumption* should be that aftermarket power was unlikely and that Kodak's circumstances were consistent with this presumption. We refer to this as the "systems" theory. The plaintiffs argued that there are several theories showing commonplace circumstances under which a durable goods manufacturer could monopolize its aftermarkets. Therefore, they argued, there should be no presumption against aftermarket power. Further, the plaintiffs

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<sup>13</sup> *Image Technical Service, Inc., et al. v. Eastman Kodak Co.*, C 87-1686 (January 18, 1996) and *Image Technical Service, Inc., et al. v. Eastman Kodak Co.*, 1996-2 Trade Case. (CCH) ¶ 71,624, (N.D.Cal). Feb. 28, 1996)

<sup>14</sup> The court required a new trial to recalculate a portion of the damages because the plaintiffs' accounting expert and the fact witnesses did not sufficiently link some of the damages to the antitrust violation. *Image Technical Service, Inc., et al. v. Eastman Kodak Co.*, 1997-2 Trade Case. (CCH) ¶ 71,908, (9th Cir. 1997).

presented facts to demonstrate that Kodak both had and exercised market power. To present the arguments put forth on each side, we will use a very simple model of firm profits from a foremarket and an aftermarket.

Whereas a firm competing in a single good has only a single price lever, a firm participating in fore- and aftermarkets considers both prices ( $p^f, p^a$ ) when maximizing profits.<sup>15</sup> The firm chooses these to maximize profits ( $\pi$ ), which, on the assumption of constant costs ( $c^f, c^a$ ) are<sup>16</sup>:

$$\begin{aligned}\pi &= \pi^f + \pi^a \\ &= (p^f - c^f)q^f(p^f, p^a) + (p^a - c^a)q^a(p^f, p^a)\end{aligned}$$

We assume that the quantities demanded for each product depend on *both* prices, e.g.,  $q^f = q^f(p^f, p^a)$ . That is, if the price of service rises, we generally expect the demand for primary market equipment to fall. This linkage between goods across markets is the essential feature of aftermarket economics. Most of the disputes can be summarized as arguments over how strong that link is under various factual circumstances.

We start by assuming that foremarkets and aftermarkets are perfectly competitive:  $p^f = c^f$  and  $p^a = c^a$ . We are interested in whether a firm can increase its profits by acquiring market power in its aftermarket while its foremarket remains competitive. Thus, we are asking if a firm can profit overall by raising  $p^a$  above  $c^a$ . That is, the basic disagreement is whether, starting from competitive pricing, the sign of  $\partial\pi^f/\partial p^a + \partial\pi^a/\partial p^a$  is positive or negative.

Economists on both sides agree that under most circumstances aftermarket profits can be increased,  $\partial\pi^a/\partial p^a > 0$ , but that there will be a simultaneous decline in foremarket profits,  $\partial\pi^f/\partial p^a < 0$ , because increasing  $p^a$  increases the overall cost of owning equipment and forward-looking buyers will reduce their equipment purchases. The debate, then, is about whether  $\partial\pi^f/\partial p^a$  is sufficiently negative to offset monopoly aftermarket profits, and thus make aftermarket monopolization unprofitable overall.

Economists writing since the Supreme Court opinion, including at least one who testified for Kodak at trial, have mostly agreed that there are circumstances under which aftermarket monopolization can be profitable overall; that is,  $\partial\pi^a/\partial p^a > -\partial\pi^f/\partial p^a$ .<sup>17</sup> We

<sup>15</sup> Whether firms compete in prices (“Bertrand”) or quantities (“Cournot”) is not important here; we discuss “price” competition for convenience. However, focus on just price alone (or just quantity) *is* an important simplification. Consumers consider factors beyond just price when products are differentiated. Such differentiation is particularly true with “service” type goods: two service programs might differ in technical quality, response time, flexibility of contract terms, provision of manufacturer-independent advice, and so forth. Kodak surveys showed that typical customers rated several factors as more important than price when choosing a service provider (see Exh. 264).

<sup>16</sup> Typically, aftermarket sales associated with a given foremarket sale will occur over a period of time. Therefore, what we refer to as aftermarket prices (for consumers) and profits (for firms) are actually discounted streams of future expenditure and profits, respectively.

<sup>17</sup> See, e.g., Borenstein, MacKie-Mason and Netz (1995, 2000), Shapiro (1995), Carlton (2001), and Chen and Ross (1993). There is yet another dispute, which is that under some circumstances even if it is profitable overall to monopolize an aftermarket, social welfare may be harmed only a little, or even improved, and thus legal antitrust intervention might be inappropriate. See footnote 27 below.

shall briefly describe some of the theories, in order to frame the facts and economic arguments presented at trial.

### **Preliminaries**

Under what conditions might we expect foremarket competition to protect aftermarket consumers? That is, when might the total effect,  $\partial\pi/\partial p^a$ , be zero or negative, so that aftermarket monopolization is not attractive?

First, for the question to be interesting there must be at least some “” aftermarket power, which we define as  $\partial\pi^a/\partial p^a > 0$ . That is, the firm must have the ability to raise aftermarket price above the competitive level and earn additional aftermarket profits, ignoring the effect on foremarket profits. This requirement implies two necessary conditions: there must be some protectable aspect to the aftermarkets, and some form of switching costs related to the primary market good.

Protectable aftermarkets mean that there are limited substitutes for, and limited entry into, the equipment manufacturer’s aftermarket.<sup>18</sup> If aftermarket substitutes are widely available at competitive prices, say from independent parts manufacturers or service providers, increases in  $p^a$  will merely result in the firm’s equipment customers making their aftermarket purchases from another supplier. That would imply  $\partial\pi^a/\partial p^a \leq 0$ .

Similarly, if equipment owners can costlessly switch from their existing equipment to a competitively priced alternative, a service price increase would induce consumers to sell their equipment and buy the alternative brand of equipment and service. It must be costly for current equipment owners to switch to another brand of equipment if the manufacturer is to have aftermarket power. There are two basic types of switching costs: inefficient used equipment markets, and complementary sunk investments that are specific to the given brand of primary good. An inefficient used equipment market means the seller of a used primary market good cannot expect to recover the full economic value of the good when she sells it. This could be due to a lemons problem or to other causes.<sup>19</sup> We will refer to these as “financial” switching costs. Financial switching costs are coterminous with the economic life of the specific piece of equipment: once a machine has zero economic value, there is no financial cost of switching to a new brand.

Switching costs from complementary investments arise when a firm needs to make investments in addition to the equipment and aftermarket good in order to utilize the equipment *and* these investments are of little value with any other brand of equipment. The classic example of complementary investment is custom applications software written for a specific operating system -- switching to a new operating system requires rewriting the applications. Other switching costs include training and

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<sup>18</sup> This implies the primary market is monopolistically competitive or a differentiated product oligopoly. It is difficult to conceive protectable aftermarkets in combination with truly homogeneous primary market goods: if there are no differences among primary market goods, how can a given aftermarket good work only with one “brand” primary market goods?

<sup>19</sup> See Akerlof (1970). However, even a perfectly functioning used-equipment market might not eliminate financial lock-in resulting from installed base opportunism. See the text below.



familiarization, converting data and archival file formats, custom configuration of peripherals, developing new relationships with expert, sales and service personnel, and so forth. We refer to these as “technological” switching costs. Technological switching costs can extend beyond the economic life of an individual piece of equipment.<sup>20</sup>

The level of total switching costs puts an upper bound on the amount of surplus a firm can extract by exercising aftermarket power. Any attempt to extract the current owner’s surplus in excess of the cost of switching results in the equipment owner switching brands. However, there are situations where switching costs are large and this constraint might not be significant. When switching costs are significant, we say consumers experience *lock-in*.<sup>21</sup>

If aftermarkets are not protectable and switching costs are negligible, then we would generally expect no local aftermarket power,  $\partial\pi^a/\partial p^a < 0$ , and the systems theory would prevail.

### **Necessary Conditions for the Systems Theory**

When a durables manufacturer has local aftermarket power ( $\partial\pi^a/\partial p^a > 0$ ), systems theory proponents argue that linkage to a competitive foremarket will protect locked-in aftermarket consumers from monopoly exploitation. That is,  $\partial\pi^f/\partial p^a$  is sufficiently large and negative so that a foremarket profit loss offsets the aftermarket profit gain. The argument is that either switching costs are low, so that current equipment owners can switch at low enough cost to constrain sufficiently the manufacturer’s aftermarket power, or that new customers (and repeat customers upgrading or replacing their equipment) will see the high aftermarket prices and demand lower equipment prices to compensate, or will purchase elsewhere. What conditions are necessary to establish a sufficiently strong linkage between fore- and aftermarkets? Three have received the most attention: sufficient, low-cost information; effective simultaneity of fore- and aftermarket purchases; and competitive foremarkets for equipment. We explain each in turn.

#### **Sufficient, Low-Cost Information**

The systems theory assumes that consumers are aware of aftermarket prices, make reasonable assumptions about their own future demand for the aftermarket goods corresponding to each primary market good, and use this information when making price comparisons. Thus, consumers are aware when a given primary market supplier charges supracompetitive prices in the aftermarket, and take their custom elsewhere.

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<sup>20</sup> This can lead to the confusing situation where future equipment purchases should properly be analyzed as aftermarket purchases: the choice of which primary market good to buy in the future is contingent on which is purchased today. Thus, technological switching costs increase competition in new product markets but reduce competition in mature markets. With new markets, firms compete vigorously to get a large base of locked-in customers; in mature markets, most customers are already significantly locked-in to a brand. See Klemperer (1987).

<sup>21</sup> For more on switching costs and lock-in, see Porter, 1985; Williamson, 1985; Farrell, 1985.

### **Effective Simultaneity**

Aftermarket goods and services are typically purchased later than foremarket equipment. Yet the systems theory requires that an increase in aftermarket prices be accompanied by an offsetting decrease in foremarket profits. This linkage requires what we call “effective simultaneity”; that is, the markets must operate as if the fore- and aftermarket purchasing decisions were being made simultaneously. Systems theory proponents suggest several ways in which effective simultaneity might be obtained. First, product lifetimes might be sufficiently short that current equipment owners will soon be purchasing new equipment, and will expect that, if charged high current aftermarket prices, they will be charged high prices in the future. (Note that this argument assumes low or non-persistent *technological* switching costs, since these can lock in repeat purchasers beyond the life of their current equipment.) Second, the ratio of new potential buyers to existing owners may be sufficiently large that high current aftermarket prices will dissuade sufficient new buyers, because they expect to be charged high aftermarket prices. (This argument requires that the firm not be able to price discriminate openly between new and old buyers.) Both approaches require that a firm’s pricing reputation is important because consumers consider the firm’s past pricing.

Another approach to obtaining effective simultaneity is through warranties and long-term aftermarket contracts purchased at the time of equipment purchase. Similarly, the availability of rental or lease agreements that include the aftermarket good or service might restrain a firm’s aftermarket power by reducing lock-in.<sup>22</sup> These arguments received little attention in *Kodak* (and similar cases) because aftermarket contracts extending for the full life of the equipment were never offered by Kodak.

### **Competitive Foremarkets**

The third premise of the systems theory that durable manufacturers cannot have aftermarket power is that the equipment foremarket be competitive. The linkage argument requires that an attempt to charge high aftermarket prices will be foiled by strong competition in the foremarket.

### **Theories of Market Power in Aftermarkets**

Kodak proposed to the Supreme Court in 1992 that as a matter of *law*, on the basis of the systems theory, it should be held that it was not *possible* for Kodak to have aftermarket power, and thus the case should be dismissed without a full factual inquiry. Various economists — some involved in the case, some not — responded by showing that under plausible circumstances *any* of the necessary conditions of the systems theory might not hold and that the conclusion about lack of market power in the aftermarkets would then change. We shall now briefly describe the main theoretical challenges to the systems theory.

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<sup>22</sup> However, these protect only against financial, not technological lock-in.

### **Installed Base Opportunism (IBO)**

One theory disputes the assumption of *effective simultaneity*. For at least some customers, there is *not* simultaneity: those who already own equipment, and who are not about to replace it. Even if the other assumptions hold, the manufacturer could practice what is known as *installed base opportunism*: after customers are locked-in, surprise them by raising aftermarket prices above the competitive level.<sup>23</sup> Competition in the foremarket may force the firm to discount new equipment sales to offset the aftermarket price increase, thereby earning zero economic profits on new sales, but due to competition the firm was *already* earning zero profits on all customers. Now the firm gets excess profits equal to the total switching costs faced by its installed base. IBO will be especially attractive for mature and declining product lines, in which most revenues are from locked-in, rather than new, customers.

### **Costly Information**

Consumers will rationally forgo complete life-cycle cost analysis if *sufficient low-cost information* is not available. Costly information also mitigates the effectiveness of reputation and thus undercuts the *effective simultaneity* assumption.<sup>24</sup> Since maintained durables often have lives of seven, fifteen or even more years, and may have parts lists thousands of items long, obtaining sufficient information about future costs, and future user needs, can be quite difficult. In addition, both durables and their aftermarket goods and services may be highly differentiated. This means a complete analysis requires extensive information gathering about each of the various models and brands considered, as well as about many features other than price. Indeed, many aftermarket products — e.g., maintenance or software — have significant “experience” components: potential buyers have great difficulty knowing their value *ex ante*.<sup>25</sup>

### **Imperfect Foremarket Competition**

Another critique of the broad applicability of the systems theory relaxes the assumption of perfectly competitive equipment markets. Markets for expensive durable equipment are often quite concentrated; and even if they are not, there is often a substantial degree of product differentiation. Thus, we see the conditions for monopolistic competition, with each firm facing a downward-sloping residual demand curve.<sup>26</sup>

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<sup>23</sup> Salop (1992) applied IBO theory to *Kodak*. The theory had been applied previously in other contexts. See, e.g., Williamson (1985).

<sup>24</sup> The plaintiffs presented this theory to the Supreme Court; Shapiro has discussed it (1995).

<sup>25</sup> For some background on experience goods, see Carlton and Perloff (1994, pp. 601-602) and references; Tirole (1988, pp. 294-295) and references.

<sup>26</sup> In high-volume copiers, Kodak and Xerox produced about 90% or more of all units sold during the relevant years. Not only was the market concentrated, but the products were also substantially differentiated.

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Klemperer (1987) has shown that in an oligopolistic market with switching costs the collusive output level can occur in a non-cooperative equilibrium. When foremarkets are not competitive, it will be generally true that a manufacturer can increase its profits further by monopolizing the aftermarket (see, e.g., Borenstein, MacKie-Mason and Netz (2001)). Several authors have pointed out that one way in which aftermarkets can be used to increase foremarket profits is through price discrimination (for example, Chen and Ross 1993). Suppose that customers are heterogeneous in the utility they derive from the good and its aftermarket. This heterogeneity is not observable in the primary market. The heterogeneity is, however, related in some manner to the consumer's demand for the aftermarket good. This allows the equipment manufacturer to use aftermarket purchases as a metering device if he has an aftermarket monopoly, and thereby to extract additional profits.<sup>27</sup>

### **Imperfect Commitment**

Borenstein, MacKie-Mason and Netz (1995) present a model that is based on precisely the assumptions of the systems theory, and show that even then there will generally be supracompetitive aftermarket pricing, and harm to consumer (and overall) welfare. The main point is that when firms cannot sign complete contracts for aftermarket products that cover the full life of the durable good, and all contingencies, then *effective simultaneity* will generally be an *approximation*, and there will be at least some room to profit from the slippage.

The intuition is not hard: as soon as the firm has some locked-in customers, it can earn at least some monopoly profits by charging a supracompetitive aftermarket price. Due to foremarket competition it may lose some foremarket profits and need to lower equipment prices, but the firm was only earning competitive (zero) profits before and the cost of a small aftermarket price change at the margin is zero, or small compared to the aftermarket profit gain. That is, given switching costs and lock-in, a rational firm will always want to extract at least some of the aftermarket monopoly profit, even if foremarket competition prevents it from extracting all of the profit. The result does not require the surprise element of the IBO theory.

The consumer harm could be much larger if, for example, aftermarket monopolization reduces desirable product differentiation (such as variety in service terms or quality), or eliminates innovation that might have occurred in a competitive aftermarket (Borenstein, MacKie-Mason and Netz 1995). Since this theory shows that the systems theory never holds completely, and that the magnitude of harm depends on

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<sup>27</sup> Chen and Ross (1993) have modeled the use of aftermarkets for price discrimination. They note that price discrimination itself has ambiguous welfare effects: the firm unambiguously increases its profits, but combined producer plus consumer welfare can either increase or decrease. Indeed, Hausman and MacKie-Mason (1988) have shown that price discrimination can even lead to a Pareto improvement if new markets are opened or economies of scale are significant. However, these concerns do not undermine the basic point: when a firm has foremarket power and can use the aftermarket to meter, it *will* earn higher profits due to aftermarket monopolization, contrary to the systems theory. It is still necessary to show antitrust *injury* from the profitable monopolization effort before winning a case.

the facts, it directly challenges the view that aftermarket monopolization should be strictly or even presumptively legal as a matter of law.<sup>28</sup>

## THE ARGUMENTS PRESENTED IN THE SUPREME COURT AND IN TRIAL

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### **Supreme Court (Summary Judgment 1992)**

It bears repeating that *Kodak* first came to the Supreme Court as the result of Kodak's motion for summary judgment. This has two implications for the outcome: all questions about disputed facts were resolved for the non-moving party (the ISOs), and the moving party had to demonstrate it could not be found guilty under any reasonable interpretation of the facts of the case. As the Supreme Court noted in its decision, the motion was heard early in the discovery phase of the case: the Court had a slim factual record upon which to base its decision.

Kodak argued that it faced substantial equipment competition in both copiers and micrographic equipment. Kodak claimed that it competed with Xerox, Canon, and others in copiers. It listed Canon, Anacomp, Bell & Howell, 3M, and others among its micrographics equipment competitors. Kodak argued that, given this equipment competition, any attempt by it to abuse its aftermarket customers would have a ruinous impact on its equipment sales: it could not *profitably* exploit whatever market power it had in its aftermarkets. Therefore, parts and service could not be distinct relevant markets for antitrust and Kodak could not be guilty of tying or monopolization.

Under the case law, even if Kodak tied or monopolized, it might not be guilty if it had legitimate business justifications. Kodak asserted three procompetitive business justifications: desire to provide quality maintenance, desire to control its inventory costs, and desire to prevent the ISO from "free riding" on Kodak's investments in equipment, parts, and service.

The ISOs countered that customers were not perfectly informed and they faced high switching costs. Therefore, even if equipment markets were competitive, aftermarket customers might not be protected from abuse. The ISOs also argued that there was evidence that Kodak had engaged in IBO. Thus, they relied on two of the theories that undo the systems theory.

The Court rejected Kodak's argument in a detailed opinion. The Court noted that Kodak's theory required factual assumptions about the real world;<sup>29</sup> Kodak's theory was

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<sup>28</sup> European Union law essentially presumes aftermarket monopolization is harmful – firms are required to sell parts. See Reed (1992)

<sup>29</sup> "Kodak's proposed rule [that "equipment competition precludes any finding of monopoly power in derivative aftermarkets." (504 U.S. 451 at 466, citing Kodak's Brief at 33)] rests on a factual assumption about the cross-elasticity of demand in the equipment and aftermarkets..." *Kodak*, 504 U.S. 451 at 469. That is, the Court recognized that the strength of the linkage depended on the factual circumstances of the case.

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not compelling on purely theoretical grounds;<sup>30</sup> and Kodak's theory, rather than being supported by evidence in the record, was contradicted by the record.<sup>31</sup> Furthermore, the ISOs presented plausible explanations for why Kodak's theory didn't explain the evidence.<sup>32</sup>

### **Trial**

The case at trial was somewhat different than the case argued before the Supreme Court. This difference stemmed in large part from the plaintiffs' discovery that Kodak had substantial market shares in what were very concentrated foremarkets.

Although this case involved copiers and various micrographics equipment, we will concentrate on the analysis of copiers. At the end, we shall briefly describe some differences in the micrographics part of the trial.

### **Plaintiffs' Arguments**

The plaintiffs made three main arguments at trial: first, that Kodak had monopoly power over repair parts, and leveraged this power to maintain and extend a service monopoly; second, to rebut Kodak's main defense, that Kodak in fact had significant market power in the foremarkets; third, also in rebuttal to Kodak, that several factors sufficiently broke any linkage between fore- and aftermarkets.

**Market definition:** The plaintiffs argued there was a relevant market for the repair parts needed for Kodak copiers. The evidence indicated that many Kodak-copier parts had no substitutes at all: they were unique to Kodak copiers. Furthermore, there were substantial costs involved in switching to another high-volume copier brand, indicating that customers would have an inelastic response to a significant increase in the price of Kodak copier parts. Last, there were barriers to entry into production of Kodak parts. Evidently a single firm controlling access to the parts could profitably raise prices substantially.

The "all parts" nature of the parts market definition was a departure from a strict interpretation of the DOJ/FTC Guidelines methodology. It resulted in clustering complements within the same relevant market. For example, fuser rollers and image loops were both in the relevant market. The plaintiffs argued that "all parts" were a relevant market based on the "commercial realities" of the case: if parts demanders could not get, for example, fuser rollers, they would have no demand for image loops. Kodak's parts manager testified that one would need "an assured supply of parts" to be in the service business.<sup>33</sup> Most customers would only deal with service providers who had an

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<sup>30</sup> "Thus, contrary to Kodak's assertion, there is no immutable physical law—no 'basic economic reality'—insisting that competition in the equipment market cannot coexist with market power in the aftermarkets." *Kodak*, 504 U.S. 451 at 471. Borenstein, MacKie-Mason and Netz (1995) showed later that even Kodak's idealized conditions, stated in Justice Scalia's dissent, imply at least some market power in aftermarkets.

<sup>31</sup> *Kodak*, 504 U.S. 451 at 472.

<sup>32</sup> *Kodak*, 504 U.S. 451 at 473.

<sup>33</sup> Tr. at 5585. Kodak used 9,942 different parts in one year to service its installed base of copiers. It used 6,430 different parts for servicing its micrographics equipment. Tr. at 5558-5559.

assured source of supply for all parts. Additionally, Kodak's policy applied to all parts, not just specific parts.

The switching costs that were relevant for parts were equally relevant for service labor, as were the theories undercutting the systems theory. Thus, a single firm controlling all service could profitably raise price substantially, and service was a relevant market.

Last, the plaintiffs argued there was a relevant market for high-speed, high-volume (HV) photocopiers. Customer testimony, internal Kodak documents, and industry sources all strongly suggested that there was a distinct HV copier market and that it was a duopoly comprised of Kodak and Xerox. This led the plaintiffs to define the HV copier market using copier speed, volume capability, and durability measures.<sup>34</sup>

**Market Power:** The plaintiffs contended that Kodak had market power in the parts market. Kodak had patents on various critical parts and refused to provide the specifications on others. There were entry barriers to parts production apart from the patents — in particular, significant minimum efficient scale.<sup>35</sup> Because a potential service competitor required access to all parts to compete, these restraints were sufficient to conclude that Kodak had monopoly power in the parts market.

Kodak also allegedly had market power in the service market. Kodak's market share was 98%.<sup>36</sup> There was evidence Kodak restricted service contract options<sup>37</sup> and engaged in significant price discrimination across service customers, both of which are indicators of possible market power.<sup>38</sup>

The plaintiffs also argued that the equipment market did not discipline the exercise of market power in the aftermarkets. One significant piece of evidence was that Kodak did *not* engage in systems pricing. Where systems pricing requires that customers paying above-average service prices pay below average prices for their equipment and vice versa, there was essentially no statistically significant correlation between the prices customers paid for equipment and the prices they paid for maintenance. The data showed that customers paid widely different systems prices on a total-cost-of-ownership (TCO) basis.<sup>39</sup>

Plaintiffs gave several reasons for this unlinking:

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<sup>34</sup> The plaintiffs used two measures of copier speed (reproducing a single-sided, single-page document and two-sided, multi-page documents), rated monthly copy volume, and weight (to reflect durability). Some Japanese copiers with high single-page speeds were offered by the early 1990s, these units still fell far short of the Kodak and Xerox offerings in the other characteristics. See Tr. Ex. 724, 725, 726, 744, 752, 753.

<sup>35</sup> A copier parts manufacturer testified that, for most parts, he would need to be supplying parts for 2000 or more machines, roughly 5% of Kodak's installed base, to generate a sufficient return on design and tooling investments (ignoring technical and patent difficulties). Tr. at 818-820, 825-827.

<sup>36</sup> Exh. 730. This left the ISOs with 1/4 to 1/20 the share held by ISOs in some other high-tech industries. Kodak's expert said Kodak's share was 90% (Tr. at 4573:11-16).

<sup>37</sup> Exh. 215. For example, ITS offered CSC an on-site technician, but Kodak did not.

<sup>38</sup> Exhs. 238, 239.

<sup>39</sup> See Exh. 743.

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- There were significant switching costs across copier brands.<sup>40</sup> In addition, shortly after introducing its parts policy Kodak increased switching costs within the Kodak service market by quadrupling the inspection & restoration fees it charged for Kodak to begin servicing a copier bought from or previously serviced by someone other than Kodak.<sup>41</sup>
- Several equipment customers testified they did not engage in TCO. A Kodak saleswoman indicated that her “TCO” proposals for customers included at most an initial few years of service while the equipment generally lasted much longer.<sup>42</sup> Kodak’s expert testified that the inclusion of later renewal agreements was necessary for TCO calculations to be correct.<sup>43</sup>
- Kodak had market power in the equipment market. Kodak and Xerox were essentially the only suppliers in the high-volume copier equipment market.<sup>44</sup> There was also extreme price discrimination across equipment purchasers.<sup>45</sup>

The plaintiffs showed that when ISOs could obtain access to parts they could compete with Kodak for service contracts with lower prices and comparable quality. Kodak’s own documents recorded that the parts policy helped Kodak exclude competition (see the quotes at the opening of this chapter). Therefore, the plaintiffs argued, Kodak’s parts policy was used to maintain and extend its service monopoly.

**IBO:** Installed base opportunism was a prominent, though not the only, theory presented to the Supreme Court. It was not the central theory at trial for copiers, but the plaintiffs did present IBO evidence. Such evidence was more prominent for micrographics. Several customers testified that after a few years on Kodak maintenance, the price increased significantly. Additionally, a Kodak saleswoman testified that *renewal* maintenance agreement terms were more limited and less attractive than for agreements purchased at the time of equipment sales.<sup>46</sup> Thus, although there was not a specific date on which Kodak raised prices to *all* current owners of Kodak equipment, there was evidence that IBO was applied customer-by-customer. Further, earlier standard industry practice had been to permit independent service. Both IBM and Xerox had sold parts for their copiers. Kodak had sold parts for its micrographic equipment. Therefore, when Kodak implemented a policy to refuse parts sales, and thus stunted the development of ISOs as the market matured, customers were surprised to find

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<sup>40</sup> Exh. 735. See also Plaintiff’s Expert Report on Liability Issues for a more detailed analysis.

<sup>41</sup> Exh. 742. This action made it riskier to try ISO service: if you were not satisfied with the ISO, it would be very expensive to return to Kodak service.

<sup>42</sup> Tr. at 4511-4517

<sup>43</sup> Tr. at 4587-4589.

<sup>44</sup> Exh. 748. The Herfindahl index for high-volume copiers was over 3100.

<sup>45</sup> Some customers paid 1.7 to 2.3 times as much for a given equipment configuration as other customers purchasing the same quantity.

<sup>46</sup> Tr. at 4511-4517



ISOs could not get parts, and prices were higher than they *would* have been, even if they did not rise in nominal terms.<sup>47</sup>

### **Kodak's Arguments**

Kodak's expert testimony closely paralleled its Supreme Court case. This meant that it followed a significantly different framework than the plaintiffs' presentation. Kodak asserted the *presumption* that equipment competition precluded profitable abuse of aftermarket power and therefore "systems" were the relevant market.

**Market Definition:** Consequently, Kodak's market definition effort focused strictly on the copier equipment market. It claimed that the market was for copiers with a multi-copy speed greater than 60 cpm. By ignoring throughput and durability, Kodak argued there was significant competition in the 1990's. Kodak also argued that the plaintiffs' price discrimination evidence did not indicate market power in a concentrated market, but rather hard customer bargaining in a vendor-competitive environment.<sup>48</sup>

**Market Power in the Aftermarkets:** Kodak's experts then addressed whether this competitive equipment market would adequately protect Kodak's aftermarket customers.<sup>49</sup> They presented hypothetical examples to suggest that Kodak would lose profits from lost future systems sales if it overcharged aftermarket customers.<sup>50</sup> They asserted that it was reasonable to expect that Kodak would lose future sales if it exploited aftermarket power because a significant part of both its micrographic and copier sales were made to existing customers,<sup>51</sup> they offered no direct evidence that repeat purchasers were responsive to aftermarket practices.

Kodak's copier expert suggested that switching costs were not significant. He did not analyze them in detail because he had concluded it would not be profitable for Kodak to exploit lock-in even if it did exist.<sup>52</sup>

Kodak argued that information costs were also not significant. They presented evidence that several publications were available that gave guidance on how to conduct TCO as well as giving independent, if anecdotal, pricing information. Additionally,

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<sup>47</sup> ISOs, when they could get parts, offered service at about 15-30% less than Kodak, and when Kodak competed head-to-head it cut prices drastically. See, e.g., Exh. 729.

<sup>48</sup> Tr. at 4634, 4669-4670.

<sup>49</sup> Kodak's economic expert on copiers believed that the systems *theory* was dispositive: he testified that merely knowing Kodak had to compete with Xerox would have been sufficient for him to conclude Kodak could not harm its aftermarket customers. (Tr. 4515:23-4516:3).

<sup>50</sup> Exh. 3697 and Tr. at 4603-4608. However, the exhibit was based on the *assumption* that Kodak would lose all future systems sales to this customer. This is the exact assumption the Supreme Court refused to accept as dispositive, demanding instead that the facts be examined. Kodak presented a similar exhibit in its micrographics presentation, using the same underlying *assumption*. Exh. 3768 and Tr. at 6010-6014, and 6323-6325.

<sup>51</sup> 75% of Kodak's copier sales between 1986 and 1994 were to past or current owners of Kodak copiers. Exh. 3695. In micrographics, somewhere between 68% and 90% of purchases from 1990 to 1994 were to past or current owners of Kodak equipment. Exh. 3733 and Tr. at 5999-6000.

<sup>52</sup> This conclusion was based on Exh. 3697. See fn. 50 and related text.

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information cost effects are mitigated by the high proportion of repeat purchasers: because such customers would be able to spread any costs of performing TCO over their several purchases, they have lower information costs per equipment unit. Kodak's experts also noted that Kodak had spent considerable money developing an automated quote system that included pricing on initial service contracts. They argued that Kodak wouldn't have done this if either it was counting on customer ignorance or customers hadn't regularly asked for such TCO information.<sup>53</sup>

Kodak also pointed out that equipment manufacturers typically have large aftermarket shares. Kodak "invented" the Kodak aftermarket, inherently having a 100% share at the inception of the aftermarket. Thus, Kodak's "monopoly" share in the market was not the result of Kodak's parts policy, but was instead a natural effect of Kodak having created the market.<sup>54</sup>

**Business Justifications:** Kodak claimed several pro-competitive business justifications for its parts policy. Kodak argued it had chosen to compete in the equipment market by adopting a strategy of providing high-quality maintenance. This and the avoidance of finger-pointing were reasons to prevent ISOs from servicing Kodak equipment.<sup>55</sup> Kodak claimed that it also needed to be the sole service provider so that it could control its parts inventory costs. Kodak argued that the ISOs were free-riding on its investment in developing maintenance methods, tools, and parts. Last, Kodak argued that its patents gave it the explicit right to refuse to sell patented parts.

### Jury Findings

The jury returned a unanimous verdict against Kodak. Based on the written instructions from the judge to the jury (and on the written opinion of the Ninth Circuit, which reviewed the case), we can infer<sup>56</sup> that the jury concluded:

- a. Equipment, parts, and service were distinct relevant markets.
- b. Kodak had a parts market monopoly.
- c. Kodak levered its parts monopoly to monopolize service.

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<sup>53</sup> Tr. at 4592-4593.

<sup>54</sup> Kodak's expert presented evidence on other industries, including IBM copiers, in which ISOs had only a 5% market share. The IBM copier example is particularly apropos because IBM was required to sell parts for its equipment to anyone who asked. Tr. at 4578, Exh. 3693, 3692.

<sup>55</sup> Finger-pointing was described as the customer's inability to distinguish between poor service and poor equipment. Thus, Kodak claimed, it had the right to control service because poor service could harm Kodak's equipment reputation.

<sup>56</sup> Juries, unlike judges, do not issue written opinions to support their decisions, but the jury was instructed by the judge that it had to make specific findings on several questions before it could conclude that Kodak was guilty.

## ANTITRUST AND ECONOMICS AFTER *KODAK*

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*Kodak* raises interesting issues about the role of economics in antitrust analysis that transcend the economics of aftermarkets. We shall briefly describe two here; space is too limited for a thorough treatment. First, should a plausible but relatively untested economic theory be sufficient, as a matter of law, to prevent a case from getting to a factual determination by a jury? Second, having gotten to the jury, where does the plaintiff's burden of proving the relevant market with *partial* equilibrium evidence in a *general* equilibrium world end?

Government intervention in markets, even when intended to correct market failures, is itself costly, and subject to error. The summary judgment procedure exists in part to balance the costs of intervention with the benefits of antitrust enforcement. A party can move for summary judgment on the basis that it will prevail as a matter of *law*, even if the facts are all interpreted in the other party's favor. *Kodak* made a somewhat novel motion for summary judgment: it claimed that on the basis of an *economic theory*, it would be impossible to show that *Kodak* had market power even if the plaintiffs had the facts right. If the plaintiffs could not establish market power, *Kodak* would prevail. The question raised is whether courts should rely on a novel, untested economic theory to conclude that despite the facts, the plaintiffs would not be able to demonstrate market power.

When dealing with questions such as market power, courts necessarily rely on economic theories. However, it is our view that there should be a strong presumption against granting summary judgment on the basis of a theory that has not been well-tested in previous cases, or for that matter in the economics literature. *Kodak's* theory had a superficial plausibility, and was endorsed by Justice Scalia in his dissent to the majority Supreme Court position. However, as shown above, economic research since *Kodak* has established that the plaintiff's alternative theory is sound, and that *additional* theories have been published and accepted under which market power in an aftermarket could exist.<sup>57</sup> When an opposing party offers a plausible alternative theory, judges are called on to evaluate the competing theories for correctness and appropriateness to the alleged factual setting, and since this is not their area of expertise, the risk of judicial error is high.

The second question, we think, is fundamental to the practice of antitrust economics: When it is impossible to do a complete, general equilibrium analysis of market interactions, how far does the burden of proof on the plaintiffs extend? *Kodak* argued in trial and in its appeal to the Ninth Circuit that since higher service profits might be offset by lower equipment profits under systems competition, the *plaintiffs* were obliged to show that *combined* profits were above competitive. Only then, *Kodak* argued, would the ability to profitably monopolize a service market be established; that

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<sup>57</sup> Indeed, one of *Kodak's* expert economists at trial has published an article acknowledging the theoretical correctness of four of the alternative theories (Shapiro 1995).

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is, only if Kodak *did* earn combined monopoly profits would plaintiffs have shown that it had market power. This is a difficult proof issue that we believe requires a policy judgment. Should it be the plaintiff's burden to prove that systems competition *did not* protect consumers from antitrust harm, or should it be the defendant's responsibility to prove that systems competition *did* protect consumer welfare?

In an ideal world, we would assess all interactions between a hypothetical monopolization and other markets. If, taking into account all interactions, it would not be possible for a defendant to harm overall social welfare, then we would not find it guilty of an antitrust violation. A complete, general equilibrium analysis will almost never be possible, yet clearly it is not consistent with antitrust policy to bar all plaintiffs from court because they are unable to perform such an extensive analysis. In general, all market definition analyses are partial equilibrium in nature.

Consider an example. Suppose Kodak asserted that by charging supracompetitive service prices, enough disgruntled customers would stop buying Kodak film products that Kodak overall would not be able to earn supracompetitive profits. (Most micrographic equipment in this case requires film, and Kodak, of course, also sells other film.) Should plaintiffs also have the burden to prove that film profit losses do not outweigh service profit gains?<sup>58</sup> What if Kodak proposed an even more remote linkage? Where should the line be drawn?

The question raised about burden of proof and the proper bounds for practicing market definition apply generally. Plaintiffs practice, and courts permit partial equilibrium analysis. However, this provides only general guidance. How far the plaintiff has to go is a policy question for Congress or the courts.

### POSTSCRIPT I: DID THE SUPREME COURT LIMIT CLAIMS TO ONLY ONE ECONOMIC THEORY?

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There have been at least seven Circuit Court opinions on aftermarket cases since the Supreme Court (1992) decision in *Kodak*, and the results are deeply divided on a fundamental issue. Three, we believe, clearly misread *Kodak*.<sup>59</sup>

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<sup>58</sup> This is not so far fetched. Kodak argued at trial that the line should be drawn not just around its equipment and complementary service, but around every product Kodak produced that a service customer might buy. Tr. at 6010-6014. Thus, Kodak argues for a presumption of "systems" wherever there are complementary products *and* that Kodak's "reputation" is sufficiently important to effectively make a wide range of superficially unrelated product complements: Kodak couldn't overcharge micrographic service customers because they might, someday, be a prospective buyer for Kodak copiers.

<sup>59</sup> The three we believe are in error are: *Lee v. Life Ins. Co. of North America*, 23 F.3d 14 (1st Cir.), cert. denied, 513 U.S. 964 (1994); *PSI v. Honeywell*, 104 F.3d 811 (6th Cir.), cert. denied (1997); and *Digital Equipment Corp. v. Uniq Digital Techs., Inc.*, 73 F.3d 756 (7th Cir. 1996) (writ of cert. pending as of this writing). The other four are *Kodak* itself in its second visit to the Ninth Circuit; *United Farmers Agents v. Farmers Ins. Exchange*, 89 F. 3d 233 (5th Cir. 1996); *Allen-Myland v. IBM*, 33 F.3d 194 (3rd Cir. 1994),

These three opinions turned on the same question: was the allegation of *installed base opportunism* the crucial issue in *Kodak*? The First, Sixth and Seventh Circuits have now each held that a *surprise* change in policy is necessary for a finding of a separate aftermarket that can be monopolized when the foremarket is competitive.<sup>60</sup> Each has dismissed a plaintiff's claims, because there was no evidence or allegation of IBO.

The Supreme Court did not write that IBO was a single, special circumstance that permitted aftermarket power. The Court wrote:

The fact that the equipment market imposes a restraint on prices in the aftermarket by no means disproves the existence of power in those markets....Thus, contrary to Kodak's assertion, *there is no immutable physical law* — no "basic economic reality" — insisting that competition in the equipment market cannot coexist with market power in the aftermarkets.

*Kodak*, 504 U.S. at 471 (emphasis added). The Court emphasized that "marketplace realities" and market imperfections, such as high information costs and lock-in from switching costs, "could create a *less responsive connection* between service and parts prices and equipment sales." *Kodak* 504 U.S. at 473 (emphasis added).

The *Kodak* Court made specifically the point that we described in the theoretical section above: the key factor in whether or not aftermarket power is possible is the strength of the link between the fore- and aftermarket responses to supracompetitive aftermarket pricing. The Court noted that *every* monopolist faces some constraints on its prices; the crucial question was the cross-elasticity between the aftermarket and the foremarket: how strong is the link?

This is the key factual issue for market definition in *all* antitrust cases. For example, slide rules can, to a degree, substitute for computers: is the linkage strong enough that consumers are protected from computer monopolization by slide-rule competition? The Court agreed with the plaintiffs that the connection could be sufficiently weak due to IBO. The Court also stated that switching costs and high information costs could make the connection sufficiently weak. In short, the Court stated that *one theory* under which the systems view could fail is IBO; it did not state that this is the only theory. This point has been reinforced by the post-Kodak economic literature. Even one of Kodak's own expert economists has published an article in which four different theories are identified under which there is an opportunity to behave monopolistically in aftermarkets, with a reduction in consumer welfare (Shapiro 1995).

There is a consistent economic theme here: firms wish to maximize profits, and thus want to act like monopolists given the opportunity. However, only sometimes are

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and *Virtual Maintenance v. Prime Computer*, 11 F.3d 660 (6th Cir. 1993). Note that in two opinions, the Sixth Circuit is in conflict with itself.

<sup>60</sup> For example, the Sixth Circuit held "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", *PSI v. Honeywell*, 104 F. 3d at 820.

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monopoly profits possible. The crucial economic question is what market constraints there are on a firm's ability to charge supracompetitive prices or otherwise earn excess profits at the expense of consumers. When studying behavior in an aftermarket, one such market constraint may be the effect that aftermarket pricing has on foremarket profitability. This link should be analyzed in an aftermarket case. But there are any number of different circumstances under which the link is not sufficient to prevent monopoly harm. Simple, but incomplete economic theories should not provide antitrust immunity for entire classes of potentially harmful behavior. If plaintiffs in a case have a plausible alternative theory of aftermarket power, and allege facts consistent with the theory, the case should proceed to trial, as did *Kodak*.

### POSTSCRIPT II: DO INTELLECTUAL PROPERTY RIGHTS GRANT IMMUNITY FROM ANTITRUST?

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After the *Kodak* case was completed, another issue that arose late in the proceedings has become very controversial, and another conflict has emerged between appeals courts. The controversy concerns the extent to which patents should have protected Kodak from antitrust liability.

Kodak argued on appeal that the patents it had on some of its parts gave it the right to refuse to sell parts to ISOs. The Ninth Circuit ruled that protecting intellectual property is presumed to be a valid, pro-competitive business justification for refusing to sell or license. However, the court stated that this was a rebuttable presumption, and concluded that plaintiffs successfully rebutted the Kodak's patent defense by showing that only about 65 of 10,000 parts were covered by patents, and that the author of the Kodak parts policy testified that he didn't give any thought to protecting Kodak's intellectual property when crafting the policy.

The Federal Circuit, which is a special court created to hear appeals on cases in which patent issues are central to the case, has more recently ruled in the *Xerox* case that intellectual property owners have a much more general immunity from antitrust law: "The antitrust laws do not negate the patentee's right to exclude others from patent property."<sup>61</sup> The *Xerox* case is remarkably similar to *Kodak* (it also involves a refusal to

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<sup>61</sup> In re Independent Service Organizations Antitrust Litigation (*Xerox*), 203 F.3d 1322 at 1325 (Fed. Cir. 2000), cert. denied, 531 U.S. 1143 (2001), quoting *Intergraph Corp. v. Intel Corp.*, 195 F.3d 1346 at 1362 (Fed. Cir. 1999). There is a fair bit of uncertainty about what the *Xerox* decision even means. For example, in *U.S. v. Microsoft* (253 F.3d 34 at 63) the U.S. Court of Appeals for the District of Columbia cited *Xerox* when it wrote:

"Microsoft's primary copyright argument borders upon the frivolous. The company claims an absolute and unfettered right to use its intellectual property as it wishes: '[I]f intellectual property rights have been lawfully acquired,' it says, then 'their subsequent exercise cannot give rise to antitrust liability.' Appellant's Opening Br. at 105. That is no more correct than the proposition that use of one's personal property, such as a baseball bat, cannot give rise to tort liability. As the

sell high-volume copier parts to ISOs), but the result was different: the court stated that firms could refuse to sell patented parts regardless of their motivation, in particular even if the motivation was to foreclose competition in a separate market such as service.

This conflict between two federal appeals courts is quite stark, and many authors have written about it in just the two years since the Xerox ruling (see, e.g., Katz and Safer (2002) and Boyle et al. (2002)). The issue highlights a long-standing area of controversy. Patent and other intellectual property laws establish property rights, which may create limited monopolies, in order to encourage invention and authorship, and endow the property owners with the right to engage in some exclusionary conduct. The antitrust laws make exclusionary conduct by a monopolist illegal. Both are seeking to enhance consumer welfare: intellectual property law by leading to new ideas and inventions, antitrust law by limiting allocative inefficiency (high prices, reduced quality or variety) by firms with current market power. Thus, we have a situation in which both types of law are largely trying to accomplish the same thing (maximizing consumer welfare) but they come into conflict.

From an economic perspective, there should be some balancing: in some situations antitrust should restrict the way in which firms use their intellectual property, and in other situations intellectual property should be exempt from antitrust restrictions. The Supreme Court has repeatedly stated that intellectual property laws grant property rights, and those property rights are sometimes limited by antitrust (and other) laws. For example, in *Kodak* it wrote “[we have] held many times that power gained through some natural advantage such as a patent, copyright, or business acumen can give rise to liability if ‘a seller exploits his dominant position in one market to expand his empire into the next.’”<sup>62</sup> However, at present the law is very unclear about when antitrust limits the ability of firms to refuse to sell patented goods, or to otherwise condition sale or licensing on anti-competitive conditions.

The *Kodak* case continues to be one of the most controversial antitrust cases of the modern era, although the controversy has expanded beyond whether aftermarket can be profitably monopolized to also include conflicts between intellectual property and antitrust law. The particular conflict between *Kodak* and *Xerox* almost surely will need to be resolved by the Supreme Court in some future case. Today, some prominent observers believe that “recent cases, and particularly the Federal Circuit’s opinion in [*Xerox*], have upset that traditional balance [between intellectual property and antitrust] in a way that has disturbing implications for the future of antitrust in high-technology industries” (Pitofsky 2001). Other equally notable analysts believe that *Kodak* got it wrong, and *Xerox* got it right (Carlton 2001). Until the Supreme Court resolves the dispute businesses and trial courts do not know what the law really is.

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Federal Circuit succinctly stated: ‘Intellectual property rights do not confer a privilege to violate the antitrust laws.’ *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d 1322, 1325 (Fed.Cir.2000).”

Yet, Microsoft’s quoted argument above also claimed to rely on *Xerox* for support.

<sup>62</sup> 504 U.S. at 480 n.29 (quoting *Times-Picayune Publishing Co. v. United States*, 345 U.S. 594, 611 (1953)).

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