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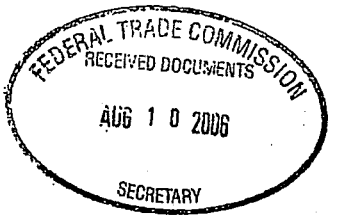

Donald S. Clark
Office of the Secretary
Federal Trade Commission
Room H-135 (Annex Z)
600 Pennsylvania Avenue NW
Washington DC 20580

RE: Comments Regarding Section 2 Hearings, Project No. P062106

Dear Mr. Clark:

I am pleased to submit my comments in the above-referenced proceeding on the analysis of product tying arrangements under Section 2. I have included my statement *Untying the Knot: The Case for Overruling Jefferson Parish*, together with four papers that I have previously (co-)written on this topic. My conclusion is that *Jefferson Parish* should be overruled and that tying arrangements should be analyzed under a structured rule of reason approach.

Any questions about my statement would be welcome.

Regards,

David S. Evans
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UNTYING THE KNOT

The Case for Overruling Jefferson Parish

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July 2006

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The *Jefferson-Parish* test for whether a tying arrangement violates the antitrust law should be abandoned. It should be replaced with a rule of reason analysis that examines whether there are adverse economic effects that outweigh potential economic benefits. There is widespread support in the modern antitrust and economics literature for adopting a rule of reason approach to tying and virtually no support for treating tying as *per se* unlawful by firms with market power.[1] Analyzing tying under a rule of reason would help complete the economic rationalization of antitrust law that started with *Sylvania* and under which *per se* treatment has been narrowed mainly to hard-core cartel behavior that has no pro-competitive benefits. Such a rule of reason analysis should be structured to screen out cases in which there is no plausible basis for believing that tying could have an adverse effect on long-run consumer welfare and should require plaintiffs to demonstrate rather than assume adverse effects from tying.

The Supreme Court should take the next opportunity to heed the advice Justice O'Connor and three other Justices offered more than twenty years ago regarding tying doctrine: "The time has therefore come to abandon the "per se" label and refocus the inquiry on the adverse economic effects, and the potential economic benefits, that the tie may have."[2] The enforcement agencies should support the effort to overrule *Jefferson Parish* and subject tying to the rule of reason. This would give the Supreme Court additional confidence in ending the *per se* treatment of tying which it has supported, despite profound reservations, because of longstanding judicial and legislative hostility towards tying.

This paper explains the basis in modern economics and antitrust analysis for overruling *Jefferson Parish.*

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[1] For further discussion David Evans, "Tying: The Poster Child for Antitrust Modernization" in (Robert W. Hahn, ed.), *Antitrust Policy and Vertical Restraints* (Washington, DC: Brookings Institution Press, 2006). A review of more than 100 papers in the last decade in the economics and legal literature found only one that supported a *per se* approach to tying. No economist to my knowledge has come to the defense of either the Jefferson Parish test or a *per se* illegal approach.

[2] *Jefferson Parish Hospital Dist. No. 2 v. Hyde*, 466 U.S. 2, 9 (1984). Justice O'Connor's Concurring Opinion at p. 58.

A Short History of Tying Jurisprudence

The Supreme Court was not receptive to tying claims at the turn of the 20th century. In *Henry v. A. B. Dick Co.*, decided in 1912, the Court encountered tying in a patent infringement claim. A. B. Dick required customers of its patented mimeograph machine to use its unpatented ink. It sued a distributor of a competitor's ink for contributory patent infringement on the grounds the distributor knew that this would induce the customer to violate the terms of the contract that permitted it to use the patented product. The Court found for A. B. Dick.[3]

In *United States v. Winslow*, decided in 1913, the government had argued that the vertical merger creating the United Shoe Machinery Company violated the Sherman Act. The concern was that the combination of three previously separate shoe machine manufacturers that each had substantial shares of machines used at different levels of the production process (and did not compete with each other) was harmful to competition. The Court ruled against the government, finding that combining the previously separate machinery was not anticompetitive: "It is as lawful for one corporation to make every part of a steam engine and to put the machine together as it would be for one to make the boilers and another to make the wheels."[4]

Around this same time a sharply divided U.S. Supreme Court enunciated the "rule of reason" in *Standard Oil* and *American Tobacco*. It did not go over well in the executive and legislative branches of the government. Some thought it broadened the Sherman Act and was judicial usurpation. Others thought it narrowed the regulation of competitive behavior too much. And still others bemoaned the lack of a clear definition of unlawful conduct that would guide businessmen.[5] Antitrust was a central issue in the Presidential campaign of 1912. The Republican, Democratic, and Progressive parties all adopted platforms calling for additional antitrust legislation. In 1914, the Federal Trade

[3] *Henry v. A.B. Dick Co.*, 224 U.S. 1 (1912).
[4] *United States v. Winslow*, 227 U.S. 202 (1913).
[5] Gilbert Montague, "Antitrust Laws and the Federal Trade Commission," *Columbia Law Review* 27 (June 1927): 650-78, p. 651-653

Commission and Clayton Acts emerged from what former President (and later Chief Justice) Taft referred to as the "hysterical condition of the public mind" in reaction to the rule of reason.[6]

Section 3 of the Clayton Act made it unlawful to condition the sale of one good on the requirement that the purchaser not buy or use another good to the extent this resulted in the substantial lessening of competition or tended to create a monopoly. United Shoe Machinery was very much on the minds of those who supported this "anti-tying provision." Representative Mitchell's view is typical of the Congressional record that led to the passage of Section 3:

> [Monopoly] has been built up by these 'tying' contracts so that in order to get one machine one must take all of the essential machines, or practically all. Independent companies who have sought to enter the field have found that the markets have been preempted. . . . The manufacturers do not want to break their contracts with these giant monopolies, because, if they should attempt to install machinery, their business might be jeopardized and all of the machinery now leased by these giant monopolies would be removed from their places of business. No situation cries more urgently for relief than does this situation, and this bill seeks to prevent exclusive 'tying' contracts that have brought about a monopoly, alike injurious to the small dealers, to the manufacturers, and grossly unfair to those who seek to enter the field of competition and to the millions of consumers.

The Court subsequently took its lead from this legislative hostility to tying contracts. In *Motion Picture Patents Co.*, decided in 1917, it overruled the holding in *A. B. Dick.* Patent holders were no longer permitted to require purchasers to take another product as a condition of buying the patented product. While the Court did not rely on the Clayton Act in reaching its findings, it noted that the Clayton Act "confirmed" the Court's conclusion and that it was "a most persuasive expression of the public policy of our country with respect to the question before us."[7] In *United Shoe Machinery* (1922) the Court found that the company's leases violated Section 3 of the Clayton Act by effectively restricting customers from leasing machines from competitors.[8]

A quarter century passed before the Court considered tying under the Sherman Act and home-grown hostility towards tying emerged. In its 1947 *International Salt*

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[6] *Id.*, p. 655
[7] *Motion Picture Patents Corp. v. Universal Film Mfg. Corp.*, 243 U.S. 502, 517-18 (1917).
[8] *United Shoe Mach.Corp. v. United States,* 258 U.S. 451 (1922)

decision the Court considered an arrangement under which International Salt conditioned the lease of its patented machines on the requirement that the lessee purchase all salt used in the leased machines from the company. The Court found that such tying was a *per se* violation of Section 1 of the Sherman Act as well as a violation of the Clayton Act.[9] In *Standard Oil*, issued two years later, Justice Frankfurter, writing a majority decision in which he was joined by four other Justices, concluded that "[t]ying arrangements serve hardly any purpose beyond the suppression of competition."[10] The *per se* prohibition against tying expanded the scope for claiming unlawful tying well beyond the patent misuse area and the sorts of contracts that could be found unlawful under Section 3 of the Clayton Act.

That view persisted for three more decades until *U.S. Steel v. Fortner Enterprises* which went up to the Court twice. U.S. Steel offered cut-rate financing to developers who also purchased its pre-fabricated houses. In *Fortner I,* four Justices dissented from the majority holding—that tying arrangements involving credit were no different from tying of other goods and services—on the grounds that the tie-in may serve legitimate purposes.[11] The case was remanded to a bench trial. The plaintiff prevailed and the case found its way to the Court again. In *Fortner II*, issued in 1977, the Court rejected the plaintiff's argument that there was an unlawful tie because it had failed to show that the defendant had market power. The plaintiff had proved "nothing more than a willingness to provide cheap financing in order to sell expensive houses." [12]

Seven years later a sharply divided Court ruled on *Jefferson Parish.* A four-judge minority wanted to scrap the *per se* approach in favor of a rule of reason approach that would consider whether the practice had adverse economic effects and weigh these against the pro-competitive benefits. The five-judge majority, however, decided to stick with the *per se* on the grounds that "[i]t is far too late in the history of our antitrust jurisprudence to question the proposition that certain tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable '*per se*.'"[13] They pointed to the Court's own history of *per se* condemnation which went back to

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[9] *International Salt Co. v. United States,* 332 U.S. 392 (1947).
[10] *Standard Oil Co. v. United States,* 337 U.S. 293, 305 (1949), p. 11.
[11] *Fortner Enterprises, Inc. v. United States Steel Corp. et al.,* 394 U.S. 495 (1969).
[12] *United States Steel Corp. et al. v. Fortner Enterprises, Inc.,* 429 U.S. 610 (1977).
[13] *Jefferson Parish Hospital Dist. No. 2 v. Hyde,* 466 U.S. 2, 9 (1984).

1947 and the legislative hostility to tying embodied in the passage of Section 3 of the Clayton Act.

Nevertheless, reaffirming the view from *Fortner I and II*, the Court unanimously rejected the view that tying can serve no legitimate purpose. The five-judge majority decision observed that,

> It is clear, however, that not every refusal to sell two products separately can be said to restrain competition. If each of the products may be purchased separately in a competitive market, one seller's decision to sell the two in a single package imposes no unreasonable restraint on either market.... Buyers often find package sales attractive; a seller's decision to offer such packages can merely be an attempt to compete effectively -- conduct that is entirely consistent with the Sherman Act.
> It strove instead to reign in the *per se* approach by building on *Fortner II.*

Essentially, the majority limited *per se* liability to those situations in which the defendant could force a significant number of consumers to take something they would have otherwise obtained from another producer. The existence of market power in the tying market was the bedrock of this inquiry.

In 2006 the Supreme Court had the opportunity to revisit the issue in *Illinois Tool Works Inc., v. Independent Ink.*[14] In *Jefferson Parish* the Court had assumed that patents necessarily conferred market power. In *Illinois Tool Works* it overruled itself noting that Congress, the antitrust enforcement agencies, and most economists recognized that patents do not necessarily confer market power and that the plaintiff must prove this rather than just assume it. Therefore, for the purposes of Sherman Section 1 the plaintiff must demonstrate that the defendant has market power in the patent tying product. As a result, the *Jefferson Parish* test applies to patented and unpatented products.

Tying now lives in its own special purgatory of antitrust jurisprudence. The practice is not strictly *per se* unlawful because, unlike hard-core price fixing, the courts inquire into market power and whether the practice actually prevents consumers from taking a competing product. Yet the practice is not really considered under the rule of reason because plaintiffs have no serious obligation to establish anticompetitive effects and defendants have little opportunity to establish efficiencies. As Justice O'Connor noted in her concurring opinion in *Jefferson Parish,* " [T]ying doctrine incurs the costs of

[14] *Illinois Tool Works Inc., v. Independent Ink, Inc.,* 126 S. Ct. 1281 (2005).

a rule-of-reason approach without achieving its benefits: the doctrine calls for the extensive and time-consuming economic analysis characteristic of the rule of reason, but then may be interpreted to prohibit arrangements that economic analysis would show to be beneficial."[15] That is the knot that needs to be untied.

The State of Antitrust Knowledge on Tying

Economists have studied the purposes and effects of tying for more than a century. A two-part article in the December 1913 and January 1914 issues of the *Journal of Political Economy* explained that tying contracts involving shoe machineries was a standard practice in the industry well before the emergence of United Shoe Machinery as a dominant firm and described the legitimate business purposes that these contracts solved.[16] Four propositions can be stated with some confidence based on the scholarly literature in economics and the modern approach to antitrust analysis.

- First, tying is widespread among firms with little market power and is therefore presumptively pro-competitive. Tying promotes lower costs and improved valued and thereby increases long-run consumer welfare. Tying also enables firms with little market power to engage in price discrimination which economists recognize does not generally decrease long-run consumer welfare.
- Second, tying has the same ability to generate efficiencies for firms with more market power as for firms with less market power. Moreover, firms with market power lack the incentive or ability to use tying as an anticompetitive strategy in a wide variety of circumstances. Tying is therefore presumptively pro-competitive for firms with market power or monopoly power.
- Third, in some circumstances, however, firms with market power in the tying product can use tying to exclude competitors in the market for the tied product or the tying product and thereby reduce long-run consumer welfare.

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[15] *Jefferson Parish Hospital Dist. No. 2 v. Hyde*, 466 U.S. 2, 9 (1984). Justice O'Connor's Concurring Opinion at p.57.
[16] R. Roe, "The United Shoe Machinery Company, Pt. 1-11" *Journal of Political Economy* 21: 938-53 (1913); R. Roe, "The United Shoe Machinery Company - Concluded" *Journal of Political Economy* 22: 43-63 (1914).

Therefore, one cannot exclude the possibility that a firm with market power may use tying in ways that have adverse economic effects.

- Fourth, tests based on mere market power, such as *Jefferson Parish*, will systematically condemn tying arrangements that are on balance pro-competitive since market power is just one of many necessary conditions for anticompetitive tying to occur. A structured rule of reason test can more accurately distinguish anticompetitive from pro-competitive tying by imposing screens for the necessary conditions that must be satisfied for firms to have the incentive or ability to engage in anticompetitive tying and requiring that plaintiffs demonstrate rather than merely assume that tying by firms with market power has adverse economic effects.

1. Tying is presumptively pro-competitive. Tying is a pervasive economic phenomenon as the Court has recognized on several occasions now.[17] There are two broad explanations for this.

The first economic explanation for tying is that it is a competitive response to demand and cost considerations.[18] On the cost side, producers save on packaging costs and can provide more reliable products through combinations. On the demand side, consumers value being able to obtain products combined together in a package because it reduces transaction costs or provides other conveniences. More broadly, tying is part of the firm's overall decisions concerning architecting products and product lines based on demand and cost considerations.[19]

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[17] See, *United States Steel Corp. et al. v. Fortner Enterprises, Inc.*, 429 U.S. 610 (1977); *Jefferson Parish Hospital Dist. No. 2 v. Hyde*, 466 U.S. 2, 9 (1984); *Illinois Tool Works Inc., v. Independent Ink, Inc.*, 126 S. Ct. 1281 (2005).

[18] Dennis Carlton & Jeffrey M. Perloff, *Modern Industrial Organization 4th ed.*, at p. 319-320 (2005); Jean Tirole, "The Analysis of Tying Cases: A Primer," *Competition Policy International* 1: 1 (Spring 2005). Yannis Bakos & Erik Brynjolfsson, "Bundling Information Goods: Pricing, Profits, and Efficiency," *Management Science* 45(12) 1613-1630 (1999); G. Eppen, W. Hanson, & R. Martin, "Bundling – new products, new markets, low risk," *Sloan Management Review*, 32, 7-14 (Summer 1991).

[19] David Evans & Michael Salinger, "An Empirical Analysis of Bundling and Tying: Over-the-Counter Pain Relief and Cold Medicines," in (J. Pil Choi, ed.), *Recent Developments in Antitrust: Theory and Evidence* (Massachusetts: MIT Press, 2006); David S. Evans and Michael A. Salinger, "Why Do Firms Bundle and Tie? Evidence from Competitive Markets and Implications for Tying Law," *Yale Journal on Regulation*, Vol. 22, No. 1, Winter 2005; David S. Evans and Michael A. Salinger, "The Role of Cost in Determining When Firms Offer Bundles," *Journal of Industrial Economics*, forthcoming (July 2006); David S. Evans, and Karen Webster, "The Architecture of Product Offerings" (January 2006).

The second economic explanation for tying is that it enables firms to increase profits through various forms of price discrimination. The term "price discrimination" is pejorative and the practice is frowned on under Section 2 of the Clayton Act. However, it is generally recognized by economists that price discrimination is a common method used by firms in competitive markets to increase profits by tailoring prices and product offerings to consumers' willingness to pay.[20] Price discrimination is particularly helpful for firms that seek profits to cover their fixed costs of production or to obtain a return on their investment in research and development. It is an especially common practice for owners of intellectual property which have comparatively high fixed costs and low marginal costs of production. Most importantly, economists do not generally regard price discrimination as a weapon that dominant firms can use to engage in anticompetitive strategies.[21]

2. Tying is presumptively competitive even when engaged in by a firm with monopoly power. The efficiency explanations for tying are just as true for a firm with monopoly power as they are for a firm that faces significant competition. When we observe a practice in competitive markets we can conclude with great assurance that it is efficient and benefits consumers in the long run. If it was not efficient it could not survive for long; competition among firms trying to provide the best products for consumers at the lowest costs would drive it out. Business practices that yield efficiencies when firms face more competition continue to yield efficiencies when firms face less competition.[22]

It is possible that as firms acquire market power they also acquire the incentive and ability to use an ordinarily efficient practice for anticompetitive ends. We know, however, from the Chicago single-monopoly profit theorem that firms do not have

[20] In his majority opinion in *Illinois Tool Works*, Justice Stevens noted that "...while price discrimination may provide evidence of market power, particularly if buttressed by evidence that the patentee has charged an above-market price for the tied package, see, e.g., 10 Areeda ¶1769c, it is generally recognized that it also occurs in fully competitive markets, see, e.g., Baumol & Swanson, The New Economy and Ubiquitous Competitive Price Discrimination: Identifying Defensible Criteria of Market Power, 70 Antitrust L. J. 661, 666 (2003); 9 Areeda ¶1711; Landes & Posner 374–375." *Illinois Tool Works Inc., v. Independent Ink, Inc.,* 126 S. Ct. 1281 (2005), p. 1292. Also see the discussion of price discrimination in Carlton & Perloff, *supra* note 18 , at p. 301-308.

[21] See Carlton & Perloff, supra note 18, at 321-322, 306-307.

[22] David Evans & A. Jorge Padilla, "Designing Antitrust Rules for Assessing Unilateral Practices: A Neo-Chicago Approach," *University of Chicago Law Review* 72: 73 (Winter 2005); Richard A. Epstein, "Monopoly Dominance or Level Playing Field? The New Antitrust Paradox," *University of Chicago Law Review* 72: 49 (Winter 2005)

increased incentives to use tying for anticompetitive ends in an important class of cases.[23] When the tied and tying products are consumed in fixed proportions—which was the case with *United Shoe Machinery* mentioned above[24]—a monopolist can obtain the maximum monopoly profit for the bundle by charging the monopoly price for the tying product and can derive no further gain through tying.

Take the case in which a firm has a monopoly in ***A*** and consumers use the monopoly product ***A*** and another product ***B*** in fixed proportions. Examples include cars and radios, computers and microprocessors, and shoes and shoe laces. The marginal cost of supplying ***B*** is c, which equals its price under competitive supply, p_c. Consumers have a final demand for the combined product ***A+B***. The monopolist maximizes profit by determining the profit-maximizing price for this combination p_m. That gives the monopolist the most profit it could possibly obtain. The monopolist can achieve this profit in several ways.

- Offer the bundle at a combined price p_m.
- Offer ***A*** only at a price p_m-c and have consumers purchase ***B*** from competitive suppliers.
- Offer ***A*** at a price of p_m-c and ***B*** at a price of c along with the other competitive suppliers.

From the monopolist's standpoint, it has nothing to gain by getting a monopoly in ***B***. It would still collect the same monopoly profit based on the combined price of p_m.[25] Nor is monopoly leveraging costless. If there is no efficiency justification for the tie then consumers would prefer to obtain the tying product without the tied product. Forcing

[23] Ward S. Bowman Jr., "Tying Arrangements and the Leveraging Problem, " *Yale Law Journal* 67 : 19 (1957), at p. 21; Richard Posner, "The Chicago School of Antitrust Analysis," *University of Pennsylvania Law Review* 127: 925 (1979); Herbert Hovenkamp, "Post-Chicago Antitrust: A Review and Critique," *Columbia Business Law Review* (2001): 257, at p. 320-21; Keith N. Hylton, *Antitrust Law: Economic Theory and Common Law Evolution* 196, 280-81 (Cambridge University Press, 2003).

[24] Aaron Director and Edward H Levi, "Law and the Future: Trade Regulation," *Northwestern University Law Review* 51: 281-96 (May-June 1956). I discuss strategies to maintain a monopoly in the tying market below.

[25] The only incentive for the monopolist in this example is to make sure that some firm is selling ***B*** competitively. It wants to avoid what economists call the "double monopoly markup" problem. If another firm had a monopoly in ***B*** that firm would restrict the output of ***B*** and raise its price above c. That would tend to reduce the sales of ***A*** and hurt the ***A*** monopoly's profits. So in this case monopoly ***A*** has an incentive to create competition in ***B***. It might do that, perhaps, by producing ***B*** itself. See the discussion of "double monopoly markup" in Carlton & Perloff, *supra* note 18, at 415.

consumers to take a product they do not want reduces their demand and willingness to pay for the bundle.[26]

The single-monopoly profit theorem does not hold strictly for those cases in which the components of a bundle are not used in fixed proportions—as was the case in *A. B. Dick* (mimeograph machines and ink) and *International Salt* (industrial salt machinery and salt). In those cases the tying product can be used to increase monopoly profit through price discrimination. Albert R. Dick, the founder of the mimeograph machine company, explained that they had required customers to purchase their ink because it enabled the company to increase the price to larger customers without raising it much to smaller customers as well as avoid situations in which their machines did not work properly because of the use of inferior supplies. As he said, "It occurred to us that if we could insure to ourselves the sale of the supplies we would not only be able to secure the profit which we were entitled to, but we would be able to give the users the highest grade of materials, which are necessary to produce the best results, and thus not only keep the machines in more constant use in the hands of the users but give them better satisfaction in every way."[27] Dick claimed at least that they were losing money on the machines before implementing this price discrimination scheme.

3. Tying can be used to maintain or acquire monopoly power under specific conditions. Economists have identified two scenarios in which monopoly firms have the incentive and the ability to tie their monopoly product ***A*** to a product ***B*** that is not a monopoly product. The crux of both scenarios is that there are scale economies in the production of ***B***. By foreclosing enough demand to competing producers of ***B,*** the monopolist denies them scale economies and captures the ***B*** market.[28]

In these cases it is possible to identify situations in which (1) the monopolist finds that it is profitable to tie ***B*** to ***A*** to foreclose the market to competing ***B*** suppliers and (2) raise the price of ***B*** higher than it would be in the absence of this foreclosure and (3)

[26] For a formal discussion, see Michael D. Whinston, "Tying, Foreclosure, and Exclusion," *American Economic Review* 80: 837 (1990), at p. 851-852. For a discussion of other conditions when the single monopoly profit theorem does not hold (when there is a threat of later entry into the initially monopolized product) see, Dennis W. Carlton & Michael Waldman, "The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries," *Rand Journal of Economics* 33: 194 (2002).

[27] John Paul Stevens, "Tying Arrangements," Conference on the Antitrust Laws and the Attorney General's Committee Report (1955), p. 143, fn. 16.

[28] Jean Tirole, "The Analysis of Tying Cases: A Primer," *Competition Policy International* 1:1 (2005).

thereby reduce consumer welfare. Carlton and Perloff give the example of a hotel on an island whose guests like to play tennis.[29] By tying the use of the hotel to the use of a tennis club the hotel can deny enough volume to other tennis clubs and end up with a tennis club monopoly. It will then be able to charge guests and non-guests a higher price for playing tennis.

It is also possible to find situations in which the monopolist finds it beneficial to monopolize the ***B*** market because it is possible that the ***B*** producers will evolve over time into competitors. Therefore, the monopolist engages in foreclosure to prevent an erosion of its profits in ***A*** rather than to obtain profits in ***B***.[30] That was the theory behind the antitrust case against Microsoft involving an internet browser. Microsoft, the argument went, saw Netscape as a potential software platform rival to Windows. Rather than risk the Netscape browser evolving into a competitive threat to Windows, Microsoft tried to eliminate Netscape through tying.[31]

Economists who have authored papers identifying these possible anticompetitive uses of tying have been careful to note that they are special cases and that one would need to determine whether the conditions under which they could occur apply in the particular case in question. For example, in his article on tying and foreclosure, Whinston notes that, "while the analysis vindicates the leverage hypothesis on a positive level, its normative implications are less clear. Even in the simple models considered here, which ignore a number of other possible motivations for the practice, the impact of this exclusion on welfare is uncertain."[32] Carlton and Waldman also caution that "trying to turn the theoretical possibility for harm shown here into a prescriptive theory of antitrust enforcement is a difficult task."[33]

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[29] Carlton & Perloff, *supra* note 18, at 389.
[30] Carlton & Waldman, *supra* note 26.
[31] See David Evans, Albert Nichols & Richard Schmanlensee, "An Analysis of the Government's Economic Case in U.S. v. Microsoft," *Antitrust Bulletin* (Summer 2001); David Evans, Albert Nichols & Richard Schmalensee, "U.S. v. Microsoft: Did Consumers Win?," *Journal of Competition Law and Economics* 1(3), 497–539 (2005)
[32] See, Whinston, *supra* note 26, at p. 855-6. Also see, Michael D. Whinston, "Exclusivity and Tying in U.S. v. Microsoft: What We Know, and Don't Know," *Journal of Economic Perspectives* 15: 79 (2001), "What is striking about the area of exclusive contracts and tying, however, is how little the current literature tells us about what these effects are likely to be. This state of (non) knowledge is, I think, responsible to a significant degree for the very strong but differing beliefs that economists often have about whether exclusive contracts and tying are likely to have welfare-reducing anticompetitive effects."
[33] Carlton & Waldman, *supra* note 26, p. 215.

Three observations about these theories on the anti-competitive use of tying are worth keeping in mind. First, the tying strategies used by the would-be monopolist in these theories are costly. The monopolist provides a suboptimal package to consumers (it denies them choices they would like to have) and therefore sacrifices profits. It must weigh these losses against future gains resulting from foreclosure. Second, these tying strategies only work if the monopolist can foreclose competition in the tied-good market, or at least substantially reduce it. The success of the strategy, therefore, depends on the existence of barriers to entry into the tied good market. Third, foreclosure of competition in the tied good market does not necessarily lead to lower consumer welfare. Therefore even when the conditions under which these theories apply hold true we cannot necessarily assume that antitrust intervention is warranted.

4. Market-power based tests cannot distinguish pro-competitive from anti-competitive ties. The second and third proposition above demonstrate that it is not possible to distinguish between anti-competitive and pro-competitive tying based solely on whether firm has mere market power in the tying good. First, there is no basis for concluding that the reasons that competitive firms engage in tying do not apply when a firm crosses some market power threshold. Second, for cases covered by the single-monopoly profit theorem there is little basis for concluding that tying may be used as an anticompetitive strategy even if the firm engaging in tying has market power. Third, market power is one of several necessary conditions, and is not a sufficient condition, for the specific economic theories that find that it is possible to use tying to maintain or acquire a monopoly.

The *Jefferson Parish* test, applied strictly, condemns tying arrangements that generate efficiencies on net for consumers, through better product offerings, lower prices, and lower transactions costs, and that enable firms, especially intellectual property holders, to recover their fixed costs through variable pricing schemes. As Justice O'Connor noted, the Court's tying doctrine "may be interpreted to prohibit arrangements that economic analysis would show to be beneficial." The rule of reason test, on the other hand, by construction, requires the plaintiff to specify the adverse economic effects of tying, permits the defendant to document efficiencies from tying, and enables the

finder of fact to weigh the pro-competitive and anti-competitive effects of tying arrangements.

Although a rule of reason test is preferable to the *Jefferson Parish* test the four propositions presented above could support a more radical departure from the existing case law: tying should be *per se* lawful. Tying is a pervasive practice among competitive firms, there is no economic basis for presuming that tying is a plausible anticompetitive strategy in most circumstances, and economists have found no operational test for identifying anticompetitive tying. Since the Supreme Court would appear unlikely to make this longer leap from *per se* illegality to *per se* legality this paper only argues for analyzing tying under the rule of reason.

That the rule of reason analysis should, however, be structured to minimize errors costs and reduce the cost of judicial administration and should recognize that tying is presumptively pro-competitive.[34] Plaintiffs should not be able to survive summary judgment unless they can demonstrate that there are two separate products, that the defendant has significant market power in the tying market, and that the defendant can exclude a significant amount of competition in the tied market to achieve an anticompetitive strategy. Plaintiffs should have to be able to demonstrate that the tying practice had or will have adverse effects on long-run consumer welfare.[35]

Tying and the Rationalization of Antitrust Law

The *Jefferson Parish* test approach to tying does not fit with modern antitrust jurisprudence.

The Supreme Court has moved most everything except hard-core price fixing and purely horizontal territorial allocation and non-compete agreements out of the *per se* category over the last three decades. The *Sylvania* decision reversed the long-standing precedent that exclusive territories for distributors were a *per se* violation of the antitrust

[34] Frank H. Easterbrook, "The Limits of Antitrust", *Texas Law Review* 63 (1): 37 (1984); Evans & Padilla, *supra* note 22.

[35] See David S. Evans, Christian Ahlborn, and A. Jorge Padilla, "The Antitrust Economics of Tying: A Farewell to Per Se Illegality," *The Antitrust Bulletin* (Spring-Summer 2004), for further discussion of a structured rule of reason approach.

laws.[36] A few years later the scope of the *per se* rule was curtailed even further when in *BMI* the Supreme Court ruled that even some price fixing arrangements may have efficiency justifications which would warrant their analysis under the rule of reason.[37] Finally in *State Oil v. Khan* in 1997, the Supreme Court unanimously decided that maximum resale price maintenance was not *per se* illegal and that it should be analyzed under rule of reason.[38]

Generally, the Supreme Court, as well as lower courts, have moved the antitrust laws to a sound modern economic footing even when that has required—as it often has—overturning the Court's older jurisprudence. Economists have noted the increasing use of sophisticated economic analysis by the U.S. courts in deciding antitrust cases since the 1970s.[39] R. Hewitt Pate, the Assistant Attorney General for the Antitrust Division, recently remarked that :

> "[a]s the sophistication of economic analysis increased, our Supreme Court began to reexamine some of these precedents and return to fundamental principles of competition and consumer welfare. In *GTE Sylvania*, the Court overruled *Schwinn*, and in *State Oil v. Khan*, it overruled *Albrecht*...in *Matsushita*, the Court poured cold water on theories of liability that make little economic sense, and it expressed skepticism of liability theories based on price cutting, which is often 'the very essence of competition.'"[40]

Jefferson Parish stands apart. The Supreme Court majority in that case deserves some credit of course. For more than thirty years the Court had spoken of tying in the same way that it has spoken of hard-core price fixing. The majority soundly rejected the view that tying never had merit as a business practice and required evidence that the tying firm had appreciable economic power. Unfortunately, the market-power based test it adopted is illogical and incoherent as an economic matter. One can see this plainly from its application to the tying of surgical and anesthesiology services at issue in the case.

Jefferson Parish Hospital, outside New Orleans, entered into an exclusive agreement with a group of anesthesiologists to provide anesthesiology services at the

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[36] *Continental T.V. v. GTE Sylvania,* 433 U.S. 36 (1977).
[37] *Broadcast Music, Inc. v. Columbia Broadcasting System, Inc.,* 441 U.S. 1 (1979).
[38] *State Oil Co. v. Khan,* 522 U.S. 3 (1997),
[39] See, William E. Kovacic and Carl Shapiro, "Antitrust Policy: A Century of Economic and Legal Thinking," *Journal of Economic Perspectives* 14(1): 43-60 (Winter 2000).
[40] R. Hewitt Pate, "Antitrust Law In The U.S. Supreme Court," Address by Assistant Attorney General, Antitrust Division, U.S. Department of Justice at the British Institute of International and Comparative Law Conference London, England (May 11, 2004)

hospital. When a doctor scheduled his patient for surgery at the hospital he had to pick—or recommend to the patient—an anesthesiologist from one of these anesthesiologists. A competing group of anesthesiologists claimed that Jefferson Parish Hospital was engaging in an anticompetitive tie in violation of Section 1 of the Sherman Act.

Jefferson Parish Hospital argued at trial that this exclusive arrangement enabled it to operate more efficiently and provide better patient care. The District Court accepted its business justifications. The Appeals Court did not. Nor it appears did the Supreme Court which considered efficiencies as part of the single-products analysis; the Court put special weight on the fact that other hospitals allowed patients to bring in their own anesthesiologists.

The Supreme Court decided that Jefferson Parish Hospital had not engaged in unlawful tying because it did not have significant market power in the market for hospital services. If Jefferson Parish was not trying to leverage market power from hospital services to anesthesiology services, what was it doing? It would seem that the most plausible explanation is that it believed that it could obtain efficiencies—and better patient care—by having an exclusive arrangement with a group of anesthesiologists.

Under the *Jefferson Parish* analysis, one assesses whether there is market power in the tying product only after determining that there are two separate products rather than one. Thus one examines market power after the single-product analysis that some have argued is a proxy for assessing whether there are efficiencies.[41] But once one has rejected efficiencies as an explanation for the practice one is always left with a puzzle if the defendant lacks market power.

The most plausible explanation for the tying practice engaged in by *Jefferson Parish* and by other defendants that have prevailed because they lack market power is that the tying practice provides efficiencies or facilitates price discrimination. That fact highlights the more serious problem with the *Jefferson Parish* test. There is no basis for believing that practices that are efficient in the absence of market power are not efficient in the presence of market power. Nor is there any basis for believing that practices that are efficient in the absence of market power transform themselves into anticompetitive weapons in the presence of market power.

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[41] See discussion of the separate products test in *US v. Microsoft,* 253 F.3d 34, (DC Cir., 2001), p. 128.

In *Jefferson Parish* the Supreme Court tied itself in knots. It tried to reconcile an archaic and misguided hostility towards tying with the plain fact that tying is a widely used and obviously efficient business practice. The time has come—and indeed is long over due—to cut the knot by overruling the *Jefferson Parish* test and analyzing tying arrangements under rule of reason.

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The antitrust economics of tying: a farewell to per se illegality

BY CHRISTIAN AHLBORN,* DAVID S. EVANS**
and A. JORGE PADILLA***

I. Introduction

Tying exists when the seller of a product requires his purchasers to take another product as well. The most robust statement one can make about tying is that it is ubiquitous. Consider the following examples: shoes are sold in pairs; hotels sometimes offer breakfast, lunch or dinner tied with the room; there is no such a thing as an unbundled car; and no self-respecting French restaurant would allow its patrons to drink a bottle of wine not coming from its cellar. In a certain sense, as Robert H. Bork noted in his famous book,

> Every person who sells anything imposes a tying arrangement. This is true because every product or service could be broken down into

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> smaller components capable of being sold separately, and every seller refuses at some point to break the product down any further. . . .[1]

The other robust statement about tying is that it typically involves both costs and benefits. Tying may result in lower production costs. It may also reduce transaction and information costs for consumers and provide them with increased convenience and variety. The pervasiveness of tying in the economy shows that it is generally beneficial—it could not survive in competitive markets if it were not. Tying may also cause harm. This could happen when the tying firm enjoys monopoly power and tying leads to the exclusion of competitors; it could not happen when the tying firm lacks significant market power.

For a long period of time, competition laws on both sides of the Atlantic failed to recognize that tying involves costs *and* benefits. They have taken a hostile approach towards tying under the assumption that "tying agreements serve hardly any purpose beyond the suppression of competition."[2] With the United States Supreme Court's decision in *Jefferson Parish* in 1984, however, the United States law on tying adopted a modified per se illegality rule that recognizes the welfare enhancing effects of tying.[3] In its 2001 decision in *Microsoft III*, the D.C. Circuit Court of Appeals, to take the efficiency effects of tying into account, adopted a rule of reason approach to the analysis of tying cases with respect to computer software platforms.[4] European Community (EC) law has not

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1 ROBERT H. BORK, THE ANTITRUST PARADOX 378–79 (1978).

2 Standard Oil Co. of California et al. v. United States, 337 U.S. 293, 305 (1949).

3 Jefferson Parish Hospital Dist. No. 2 et al. v. Hyde, 466 U.S. 2 (1984).

4 United States v. Microsoft Corp., 253 F.3d 34 (D.C. Cir. 2001) [hereinafter *Microsoft III*]. The appeals court had heard two previous and somewhat related cases. United States v. Microsoft Corp., 159 F.R.D. 318 (D.D.C. 1995), *rev'd*, 56 F.3d 1448 (D.C. Cir. 1995) [hereinafter *Microsoft I*] resulted in a consent decree, in which Microsoft agreed to end certain volume discounting practices and not to tie the sales of other products to Windows. In United States v. Microsoft Corp., 980 F. Supp. 537 (D.D.C.

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experienced a similar movement to a recognition that even firms with market power may enter into tying without harming and possibly benefiting consumers.[5]

In this article, we show that modern economic thinking supports a rule of reason approach toward tying. The argument is as follows: (1) Tying is so common in competitive markets that it must provide efficiencies; economic theory identifies many possible sources of these efficiencies. (2) The economic literature finds that tying may have anticompetitive effects (putting possible efficiencies to one side) when certain necessary conditions hold; market power is just one of those necessary conditions. (3) No economic theory finds that market power (or dominance) is a sufficient condition for tying to have anticompetitive effects; nor does any economic theory find that market power and the absence of separate demand are sufficient conditions for tying to have anticompetitive effects (the *Jefferson Parish* test). (4) One must conduct a factual analysis to determine whether tying has anticompetitive effects—economic theory by itself only says that tying *might be* anticompetitive (in the same sense that owning a knife might enable one to engage in lethal actions). (5) One must also conduct a factual analysis to determine whether tying has procompetitive effects—again economic theory by itself only says that tying *might be* efficient; however the pervasiveness of tying in competitive markets provides considerable support to the existence of these efficiencies generally. (6) A rule of reason analysis is the appropriate framework for conducting the factual analysis described in points (4) and (5).

1997), *rev'd*, 147 F.3d 935 (D.C. Cir. 1998) [hereinafter *Microsoft II*], the D.C. Circuit Court of Appeals found that Microsoft had not violated the consent decree because it was held that Windows was an integrated product of which Internet Explorer was a part.

[5] Especially for multinationals the legal treatment of tying is important in these two jurisdictions. The U.S. accounted for 33% of global production in 2001 while the EU accounted for 25%. Percentages are based on authors' calculations. World Bank, *Total GDP 2001* (visited Jan. 27, 2003) http://www.worldbank.org/data/databytopic/GDP.pdf. Many companies have to design products and conduct themselves under the more restrictive of these two sets of laws since the cost of customizing to products and business practices can be prohibitive.

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We have a modest proposal and a radical one. Our modest proposal is a three-step rule of reason analysis that screens out ties that could not be anticompetitive—because the necessary conditions do not hold—and then balances anticompetitive and procompetitive effects in the final stage. Our radical proposal is to make tying legal except in circumstances in which there is strong evidence that it harms consumers; this is modified per se legality. Our reasoning is that tying is generally efficient and that economists have provided the courts with little guidance on how to distinguish ties that, on net, are anticompetitive from those that are procompetitive. Therefore, society faces substantial risk that the courts will condemn many procompetitive ties in ferreting out the few anticompetitive ties.

The article proceeds as follows. In sections II and III, we describe the main features of U.S. and EC tying law and consider their recent evolution, or lack thereof. Section IV compares the approach to tying on both sides of the Atlantic and explains their differences. In section V, we review the economic literature on tying and summarize its main implications for the analysis of tying cases. In section VI, we consider the advantages and disadvantages of rules that range from per se illegality at one extreme to per se legality at the other extreme. We explain why either our modest or our radical proposal are superior to the modified per se illegality rule that is currently employed on both sides of the Atlantic. Section VII concludes.

II. U.S. case law: from per se illegality to rule of reason

Tying under U.S. law has been defined as "an agreement by a party to sell one product but only on the condition that the buyer also purchases a different (or tied) product, or at least agrees that he will not purchase that product from any other supplier."[6]

The assessment of tying arrangements under U.S. antitrust law has undergone significant changes over time. We can distinguish at least three different approaches. First, the early period of the per se approach: early cases reflect a strong hostility toward tying

[6] Northern Pacific Railway Co. et al. v. United States, 356 U.S. 1, 5–6 (1958).

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arrangements that were regarded as having no redeeming features, "[serving] hardly any purpose beyond the suppression of competition."[7] Second, the modified per se illegality approach: *Jefferson Parish* moved to an approach in which the criteria for tying are used as proxies for competitive harm and, arguably, efficiencies.[8] Third, the rule of reason approach: *Microsoft III* introduced a rule of reason approach toward tying, recognizing that, at least in certain circumstances,[9] even the modified per se approach would lead to an overly restrictive policy toward tying arrangements.

A. *The per se illegality approach*

Early cases viewed tying arrangements largely as a means of restricting competition, with few, if any, redeeming features. In *United States Steel v. Fortner*, the Court held that tying arrangements "generally serve no legitimate business purpose that cannot be achieved in some less restrictive way."[10]

Northern Pacific Railway v. United States[11] is a good example of the early approach. The railroad was the owner of millions of acres of land in several Northwestern States and territories. In its sales and lease agreements regarding this land, Northern Pacific had inserted "preferential routing" clauses. These clauses obliged purchasers or lessees to use Northern Pacific for the transportation of goods produced or manufactured on the land, provided that Northern Pacific rates were equal to those of competing carriers.

The Supreme Court took the view that Northern Pacific had significant market power. Not only was its land "strategically located

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[7] Standard Oil Co. et al. v. United States, 337 U.S. 293, 305–06 (1949).

[8] Jefferson Parish Hospital Dist. No. 2 et al. v. Hyde, 466 U.S. 2 (1984).

[9] *See Microsoft III, supra* note 4.

[10] United States Steel Corp. et al. v. Fortner Enterprises, 394 U.S. 495, 503 (1969).

[11] Northern Pacific Railway Co. et al. v. United States, 356 U.S. 1 (1958).

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in checkerboard fashion amid private holdings and within economic distance of transportation facilities" but "[t]he very existence of this host of tying arrangements is itself compelling evidence of [Northern Pacific's] great power, at least where, as here, no other explanation has been offered for the existence of these restraints."[12] It concluded that the preferential routing clauses amounted to illegal tying.[13]

I. THE ELEMENTS OF THE PER SE APPROACH Given the assumption that tying had no redeeming features, a per se prohibition was an almost inevitable policy conclusion: any tying arrangement by a seller with significant market power in the market for the tying product was per se illegal provided the effects of the arrangements in the market of the tied product exceeded a certain de minimis threshold ("a 'not insubstantial' amount of commerce").[14]

(a) Market power Despite the fact that tying has generally been considered under section 1, rather than section 2, of the Sherman Act,[15] a certain degree of market power by the seller in the market of the tying product has consistently been one of the prerequisites of illegal tying. The seller's market power did not, however, have to amount to monopoly power within the meaning of section 2 of the Sherman Act. According to the Supreme Court, the relevant question was whether "a party has sufficient economic power with respect to the tying product to appreciably restrain free competition in the market for the tied product."[16]

"Sufficient economic power" could be established in a number of ways, not all of which were related to the concept of market power.

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12 *Id.* at 8–9.

13 *Id.*

14 Jefferson Parish Hospital Dist. No. 2 et al. v. Hyde, 466 U.S. 2, 16 (1984); Northern Pacific Railway Co. et al. v. United States, 356 U.S. 1, 11 (1958).

15 *See* 15 U.S.C. §§ 1, 2 (2002); 15 U.S.C. § 14 (2002); and 15 U.S.C. § 45 (2002).

16 Northern Pacific Railway Co. et al. v. United States, 356 U.S. 1, 2 (1958).

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Early Supreme Court cases[17] were concerned with sellers forcing customers to accept unpatented products in order to be able to use a patent monopoly, and the patent rights were deemed to give the seller "sufficient economic market power." In later cases, "sufficient economic power" was "inferred from the tying product's desirability to consumers or from uniqueness in its attributes"[18] or from the fact that "the seller has some advantage not shared by his competitors;"[19] and as mentioned earlier, in *Northern Pacific Railway v. United States* the mere "existence of [a] host of tying arrangements in itself"[20] was regarded as "compelling evidence of [a firm's] great power"[21] in the absence of other explanations. Not surprisingly, in this case, the Court did not take the preliminary step of defining the relevant market.

(b) Tying arrangements Firms with significant market power were prohibited from entering into tying arrangements, i.e. to force customers to purchase a tied product along with the "separate" tying product. The firms were subject to this prohibition independently of any anticompetitive effects or efficiency gains. In what follows, we first address what it means to have "two separate products" and then what it means to "force" a purchase.

In early cases, tying involved products that were intuitively separate, such as land and transport services[22] or projectors and motion pictures[23] and, as the court of appeals in *Microsoft III* pointed out, "[t]he requirement that a practice involve two separate products before being

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[17] International Salt Co., Inc. v. United States, 332 U.S. 392, 395–96 (1947); International Business Machines Corp. v. United States, 298 U.S. 131 (1936).

[18] United States v. Loew's Inc. et al., 371 U.S. 38, 45 (1962).

[19] United States Steel Corp. et al. v. Fortner Enterprises, Inc., 429 U.S. 610, 620–21 (1977).

[20] *See* Northern Pacific Railway Co. et al. v. United States, 356 U.S. 1, 8 (1958).

[21] *Id.*

[22] *Id.*

[23] Motion Picture Patents Co. v. Universal Film Manufacturing Co. et al., 243 U.S. 502 (1917).

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condemned as an illegal tie started as a purely linguistic requirement: unless products are separate, one cannot be 'tied' to the other."[24]

In subsequent cases, the issue of separate products arose but was addressed in an ad hoc manner—on the basis of a wide range of different factors, such as whether the bundled products were generally sold "as a unit with fixed proportions,"[25] whether components are charged separately, or whether other players in the industry sell products individually or as a bundle.[26] The courts did not develop any systematic standard, nor did their analysis take into account the underlying policy considerations of tying, such as foreclosure and efficiencies.

Establishing "separate products" is not enough, however. A key element of tying "is the forced purchase of a second distinct commodity;"[27] in other words, what distinguishes illegal tying from legal bundling is the "seller's exploitation of its control over the tying product to force the buyer into the purchase of a tied product that the buyer either did not want at all or might have preferred to purchase elsewhere on different terms."[28] Where the buyer is given the option to purchase products individually or as a bundle, and the option to purchase individual products is economically feasible, no tying occurs.

(c) A substantial amount of commerce in the tied product For a tying arrangement to be illegal under the per se approach, "a 'not insubstantial' amount of interstate commerce"[29] in the tied product had to be affected. The Supreme Court said that the relevant question was "whether a total amount of business substantial enough in terms of dollar volume so as not to be merely *de minimis*, is foreclosed to

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24 *Microsoft III, supra* note 4, at 128.

25 Arlie Mack Moore et al. v. Jas. H. Matthews & Co. et al., 550 F.2d 1207, 1215 (9th Cir. 1977).

26 Times-Picayune Publishing Co. et al. v. United States, 345 U.S. 594, 614 (1953).

27 *Id.*

28 Jefferson Parish Hospital Dist. No. 2 et al. v. Hyde, 466 U.S. 2, 12 (1984).

29 *Id.* at 2.

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competitors by the tie-in."[30] In *United States v. Loew's*, for example, the Supreme Court held that as little as $60,000 was not insubstantial.[31]

(d) Exceptional justifications and defenses U.S. courts have, in certain circumstances, accepted justifications for tying arrangements that would otherwise be caught by the prohibition. During the development period of a new industry, a tying arrangement was held to be justified for a limited period on the basis that selling an integrated system would help in assuring the effective functioning of the complex equipment.[32] The Supreme Court also held, however, that the protection of goodwill may not serve as a defense for tying the purchase of supplies to a leased machine where such protection can be achieved by less restrictive means, e.g. through quality specifications to third parties.[33]

2. THE PER SE ILLEGAL APPROACH IN CONTEXT Under the per se illegality approach, the courts accepted that some form of economic or market power was a necessary condition for harmful tying. In light of their assumption that tying did not have any redeeming features, they did not address whether market power was also a sufficient condition. Nor did they appear to have recognized that tying was a ubiquitous phenomenon among firms with little or no market power and therefore must have served some "purpose beyond the suppression of competition."[34]

Nevertheless, the hostility against tying was largely directed against contractual tying while technological integration frequently escaped the per se prohibition. In *ILC Peripherals Leasing v. IBM*,[35] for example, IBM's integration of magnetic discs and a head/disc

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[30] Fortner Enterprises, Inc. v. United States Steel Corp. et al., 394 U.S. 495, 501 (1969).

[31] This figure is $361,461 in 2002 U.S. dollars. United States v. Loew's Inc. et al., 371 U.S. 38, 49 (1962).

[32] Jerrold Electronics Corp. et al. v. United States, 365 U.S. 567 (1961).

[33] *Id.*

[34] Standard Oil Co. of California et al. v. United States, 337 U.S. 293, 305–06 (1949).

[35] *See* ILC Peripherals Leasing Corp. v. International Business Machines Corp., 448 F. Supp. 228, 233 (N.D. Cal. 1978).

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assembly was not held to amount to an unlawful tying arrangement. Similarly, IBM in the 1970s integrated memory into its CAUs platform. IBM was challenged by a peripheral manufacturer. The district court dismissed the tying claim on the basis that courts were not well placed to decide on product design decisions.[36]

The hostile approach toward tying was revised in *Jefferson Parish*, where the Supreme Court accepted that tying could have some merit and struggled to devise a test that distinguished good tying from bad tying.

B. The modified per se approach

In *Jefferson Parish*[37] four Justices sought a rule of reason approach.[38] Five Justices coalesced around an approach that kept the per se prohibition but made some significant nods toward recognizing efficiencies. The majority view seems to have been influenced more by deference to precedent rather than a conviction that a per se prohibition was the most appropriate way to deal with tying arrangements. The *Jefferson Parish* case concerned the tying of hospital services and anesthesiological services. In 1977 Edwin Hyde, an anesthesiologist, applied for admission to the medical staff of East Jefferson Hospital. The hospital denied the application as it had entered into an agreement with Roux & Associates (Roux), a professional medical corporation, to provide all of the hospital's anesthesiological services. Dr. Hyde then sued East Jefferson Hospital, among others, under section 1 of the Sherman Act, seeking an injunction to compel his admission to the medical staff. The decisions by the various courts that considered this arrangement turned on whether the hospital had market power. The Supreme Court and the trial court concluded that it did not, but the Supreme Court took this case as an opportunity to reconsider the per se approach.

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36 *See* Telex Corp. v. International Business Machines Corp., 367 F. Supp. 258 (N.D. Okla. 1973).

37 Jefferson Parish Hospital Dist. No. 2 et al. v. Hyde, 466 U.S. 2 (1984).

38 Justice O'Connor, with whom Chief Justice Burger, Justice Powell and Justice Rehnquist joined, argued for the contract to be analyzed under the rule of reason.

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1. THE ELEMENTS OF THE MODIFIED PER SE APPROACH *(a) The tying criteria as proxies for competitive harm* Contrary to the early cases, the Supreme Court in *Jefferson Parish* recognized that tying may, at least in certain circumstances, be welfare enhancing:

> [N]ot every refusal to sell two products separately can be said to restrain competition. If each of the products may be purchased separately in a competitive market, one seller's decision to sell the two in a single package imposes no unreasonable restraint on either market, particularly if competing suppliers are free to sell either the entire package or its several parts. . . . Buyers often find package sales attractive; a seller's decision to offer such packages can merely be an attempt to compete effectively—a conduct that is entirely consistent.[39]

At the same time, the majority opinion of the Supreme Court in *Jefferson Parish* felt compelled to continue to work on the basis of a per se prohibition of tying arrangements:

> It is far too late in the history of our antitrust jurisprudence to question the proposition that certain tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable "*per se*."[40]

Caught between these propositions the Court tried to fence in the per se rule. It focused on the underlying rationale of the rule against tying, namely impairing competition on the merits in the tied market, and approached the definitional questions in relation to the tying criteria (e.g. whether two separate products were involved or whether the seller had market power in the tying market) from the position of "whether the arrangement may have the type of competitive consequences addressed by the rule."[41] In effect, the criteria for illegal tying were used as proxies for anticompetitive harm to provide a safe harbor for some tying arrangements and to thereby screen out some false positives.

Starting with the question, "whether there is a possibility that the economic effect of the arrangement is that . . . petitioners have foreclosed competition on the merits in a product market distinct from

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[39] Jefferson Parish Hospital Dist. No. 2 et al. v. Hyde, 466 U.S. 2, 19 (1984).

[40] *Id.* at 14.

[41] *Id.* at 21.

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the market for the tying product,"[42] the Supreme Court rejected an approach that relied on the functional relationship to determine whether one or two products were involved. Instead, the Court focused on the character of demand for the two products:

> [I]n this case, no tying arrangement can exist unless there is a sufficient demand for the purchase of anesthesiological services separate from hospital services to identify a distinct product market in which it is efficient to offer anesthesiological services separately from hospital services.[43]

To answer the question whether there is sufficient demand for the tied product separately from demand for the tying product, the Supreme Court looked at actual market practice for hospitals that did not insist on providing a package including anesthesiological services. It found that patients frequently request separate anesthesiological services and concluded, "the hospital's requirement that its patients obtain necessary anesthesiological services from Roux combined the purchase of two distinguishable services in a single transaction."[44]

The use of the tying criteria as proxies for competitive harm also led the Supreme Court to use a definition of economic power that was more focused on the economic concept of market power: "[W]e have condemned tying arrangements where the seller has some special ability—usually called 'market power'—to force a purchaser to do something that he would not do in a competitive market."[45]

In *Jefferson Parish*, a 30% market share led the Court to conclude that the defendant did not have the requisite market power.[46] That is how the hospital escaped per se illegality.

(b) The separate-product test as a proxy for efficiencies While the Supreme Court in *Jefferson Parish* viewed its separate-product test predominantly as a proxy for competitive harm (on the basis that tying arrangements do not foreclose manufacturers of tied products if

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42 *Id.*

43 *Id.* at 22.

44 *Id.* at 24.

45 *Id.* at 13–14.

46 *Id.* at 7–8.

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there is no consumer demand for the stand-alone tied products in the first place), the court of appeals in *Microsoft III* pointed out that the separate-product test could also be viewed as a proxy for the net welfare effect of a tying arrangement. The reasoning of the court of appeals runs along the following lines:

First, consumers value choice: "assuming choice is available at zero cost, consumers will prefer it to no choice."[47] For consumers to relinquish choice and to buy products as a bundle, bundling must provide efficiencies (e.g. reduced transaction costs or better performance) that compensate for the reduction in choice.

Second, the share of consumers buying a bundle rather than individual products gives an indication of the relative strengths of the tying efficiencies compared to the benefits of choice. Where all (or almost all) consumers prefer to buy bundles, there is a strong presumption that the tying efficiencies dominate the consumer choice benefits.

Third, "[o]n the supply side, firms without market power will bundle two goods only when cost savings from joint sale outweigh the value consumers place on separate choice. So bundling by all firms implies strong net efficiencies."[48]

2. THE MODIFIED PER SE APPROACH IN CONTEXT *Jefferson Parish* was followed by *Eastman Kodak v. Image Technical Services*,[49] which dealt with the claim that Kodak had illegally tied the sale of replacement parts for its high-volume photocopier and micrographics equipment (tying product) to the purchase of Kodak's repair services (tied product). The Supreme Court accepted the possibility of illegal tying even in the absence of market power in the primary market, significantly expanding the scope of illegal tying.[50] At the same time however, the Court in *Kodak* confirmed the modified per se rule and the separate-products test developed in *Jefferson Parish*.

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[47] *Microsoft III*, *supra* note 4, at 135.

[48] *Id.* at 135.

[49] Eastman Kodak Co. v. Image Technical Services, Inc. et al., 504 U.S. 451 (1992).

[50] *Id.*

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The modified per se approach under *Jefferson Parish* and *Kodak* clearly raised the standard for establishing illegal tying and reduced the risk of false positives. Nevertheless, it remained fundamentally a per se approach. It did not assess the impact of the individual tying arrangements in the circumstances of a given case. Moreover, it assumed that on average the competitive harm of tying arrangements is greater than their efficiency gains, at least where the criteria for tying were satisfied. A closer look at when this assumption is likely to hold is warranted.

As we have seen above, the separate-product test acts as a proxy for the effects of tying arrangements on both harm to competitors and consumer welfare. If the separate-product test is not satisfied (i.e. there is no separate demand for the "tied" product), then this leads to the conclusion that (1) there is no competitive harm, given that there is no separate market for tied products that could be foreclosed, and (2) tying is welfare enhancing (otherwise consumers would request products separately). Conversely, if the separate-product test is satisfied, it leads to the conclusion that there could be some competitive harm,[51] and that tying is unlikely to be welfare enhancing.

It is important to note, however, the asymmetric strengths of the conclusion for a negative and positive result of the separate-product test. A negative result of the separate-product test leads to strong conclusions regarding competitive harm and efficiencies, neither of which is dependent on particular assumptions (namely that there can be no competitive harm, and that tying must be motivated by significant efficiencies). A positive result does not lead to any particular conclusion about competitive harm (other than that the possibility exists). Indeed, the fact that there is separate demand for the "tied" product (i.e. that customers are willing to purchase the "tied" product separately, and that some firms are offering the "tied" product separately) allows only the conclusion that tying is not efficient if both of two conditions hold.

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[51] Whether competitive harm can be expected is then considered in the second test under *Jefferson Parish*, namely the test of forcing through market power.

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First, the market for the tied product is static and not, for example, characterized by innovation. This condition is due to the fact that the separate-product test (both as consumer demand test and as industry custom test) is backward looking, or as the court of appeals put it in *Microsoft III*:

> The direct consumer demand test focuses on historic consumer behavior, likely before [technological tying], and the industry custom test looks at firms that, unlike the [tying firm] may not have integrated the tying and the tied goods. Both tests compare incomparables—the [tying firm's] decision to bundle in the presence of integration, on the one hand, and the consumer and competitor calculations in its absence, on the other.[52]

The more dynamic the industry, the greater the expected error of the separate-product test under *Jefferson Parish*.

The second condition is that all firms in the market for the tied products have similar characteristics (for example similar cost structure) and operate in similar circumstances (e.g. have a similar client base). Without this condition it would not be possible to draw any conclusions from the fact that the majority of firms in a particular market did or did not bundle certain products, as any difference in strategy could be attributable to differences in characteristics or circumstances.

In practice, most industries do not satisfy the above conditions. This is particularly true for the software industry, which is characterized by a high degree of innovation as well as considerable asymmetry in the characteristics and circumstances of the market players. *Microsoft III* was therefore a case predestined to highlight the weakness of the modified per se approach under *Jefferson Parish* due to the underlying assumptions.

C. *The rule of reason approach in* Microsoft III

The U.S. Department of Justice and 21 states raised a number of antitrust charges against Microsoft, ranging from monopoly leveraging to monopoly maintenance and exclusive distribution.[53] The

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[52] *Microsoft III, supra* note 4, at 140.

[53] *See* United States v. Microsoft Corp., Civil Action Nos. 98-1232 and 98-1233 (TPJ), Direct Testimony of Frederick R. Warren-Boulton, Nov. 18, 1998, at 19–28, 40–60.

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plaintiffs also alleged that Microsoft had violated U.S. antitrust law by contractually and technologically bundling the Internet Explorer (IE) with its Windows operating system.[54]

The district court, applying the test under *Jefferson Parish*, held that the combination of IE and Windows met the *Jefferson Parish* conditions and was therefore illegal. The court of appeals rejected the *Jefferson Parish* test and concluded that software platforms such as Windows, should be subject to a rule of reason balancing anticompetitive effects and efficiencies.[55] In particular the court of appeals held "that integration of new functionality into platform software is a common practice and that wooden application of *per se* rules in this litigation may cast a cloud over platform innovation for PCs, network computers and information appliances."[56]

1. THE RULE OF REASON APPROACH The court of appeals challenged the district court's application of the modified per se rule under *Jefferson Parish* on two grounds: first, at a general level, that a per se rule was inappropriate in cases like *Microsoft III* which raised a number of novel issues; second, and more specifically, that the separate-product test of the modified per se rule developed under *Jefferson Parish* could not be relied on in this case.

(a) Per se rule inappropriate in the Microsoft III *case* The court of appeals referred to the Supreme Court's decision in *Broadcast Music, v. CBS*,[57] which had warned, "[i]t is only after considerable

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[54] *See* United States v. Microsoft Corp., Civil Action Nos. 98-1232 and 98-1233 (TPJ), Direct Testimony of Franklin M. Fisher, Jan. 5, 1999, at ¶¶ 79–81.

[55] *Microsoft III*, *supra* note 4.

[56] *Id.* at 159. Microsoft proposed a test that a three-judge panel of the court of appeals had used to analyze software integration under a consent decree that Microsoft had entered into with the Justice Department to settle a previous case. That test stated that technological tying is presumed legal if the defendant can show a "plausible claim" of benefits from the tie. *See id.* The court, sitting en banc, rejected this as well.

[57] Broadcast Music, Inc. et al. v. Columbia Broadcasting System, Inc. et al., 441 U.S. 1 (1979).

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experience with certain business relationships that courts classify them as *per se* violations."[58] According to the court, the overwhelming share of tying cases dealt with by the Supreme Court had involved either the conditioning of the sale or lease of a potential product on the purchase of certain unpatented products (such as *IBM v. U.S.*) or contractual ties (such as *Northern Pacific Railway v. U.S.*).[59]

The *Microsoft III* case, however, was fundamentally different from the tying cases so far addressed by the Supreme Court in at least two respects:

1. "[i]n none of the cases was the tied good physically and technologically integrated with the tying good;"[60] and
2. the argument was raised that the "tie improved the value of the tying product to users and to makers of the complementary goods."[61]

As a result of these specific characteristics, certain of the general policy conclusions, such as that the efficiencies of tying could be achieved by other less restrictive means, were questionable:

> Microsoft argues that Internet Explorer (IE) and Windows are an integrated physical product and that bundling of IE Application Program Interfaces (APIs) with Windows makes the latter a better applications platform for third-party software. It is unclear how the benefits from IE APIs could be achieved by quality standards for different browser manufacturers.[62]

While the court of appeals did not take any view on the validity of the efficiency claims, it came to the conclusion that

> judicial "experience" provides little basis for believing that, "because of their pernicious effect on competition and lack of any redeeming virtue" a software firm's decisions to sell multiple functionalities as a package should be "conclusively" presumed to be unreasonable and

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[58] *Microsoft III*, *supra* note 4, at 124 quoting United States v. Topco Assocs., Inc., 405 U.S. 596, 607–08 (1972).

[59] *Id.* at 141–43.

[60] *Id.* at 144.

[61] *Id.*

[62] *Id.*

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> therefore illegal without elaborate inquiry as to the precise harm that they have caused or the business excuse for their use.[63]

(b) Failure of the product test as a proxy for efficiencies As described earlier, the separate-product test of *Jefferson Parish* operates under very narrow assumptions; in particular that all competitors are in a similar situation and that the markets are static. These assumptions seemed to be particularly inappropriate in the case of *Microsoft III.* According to Microsoft, the reason why none of its competitors' products required nonremoval of the Internet browser was that none of them had invested the resources to integrate Web browsing as deeply into its operating system as Microsoft.[64] Microsoft also contended that the integration of IE into Windows was innovative and beneficial.[65]

The court of appeals argued that the "*per se* rule's direct consumer demand and direct industry custom inquiries are, as a general matter, backward looking and therefore systematically poor proxies for overall efficiencies in the presence of new and innovative integration."[66] It therefore concluded:

> In fact there is merit to Microsoft's broader argument that Jefferson Parish's consumer demand test would "chill innovation to the detriment of consumers by preventing firms from integrating into their products new functionality previously provided by standalone products—and hence, by definition, subject to separate consumer demand."[67]

The D.C. Circuit remanded the government's tying claim to the district court to be considered under the rule of reason.[68] The government decided to drop the claim.[69] An appeal of the tying

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63 *Id.*

64 *Id.* at 138.

65 *Id.* at 139.

66 *Id.* at 140.

67 Microsoft Corporation's Appellate Brief at 69, *quoted in Microsoft III, supra* note 4, at 139.

68 *Microsoft III, supra* note 4.

69 *Id.*

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decision to the Supreme Court seems highly remote as the case has evolved.[70]

2. THE RULE OF REASON IN CONTEXT U.S. antitrust policy towards tying had a long journey from the hostile approach of the early per se rule to a modified per se rule willing to consider the possibility of tying efficiencies (with four Justices in favor of a rule of reason) under *Jefferson Parish*, to a neutral position under the *Microsoft III* rule of reason.

This journey is not yet over. *Jefferson Parish* still represents the general position with respect to tying, as the scope of *Microsoft III* was limited by the court of appeals to product integration in "platform software markets" and only then, as a matter of law, in the D.C. Circuit. The overall direction of the journey, however, has been made clear, and *Microsoft III* is unlikely to be the final stop, as the criticism of the court of appeals concerning *Jefferson Parish* is of a general and universal nature.

III. EC tying law: old cases, old ideas

Contrary to U.S. law, the issue of tying under EC law has been addressed largely in the context of the control of unilateral behavior of dominant firms, although tying may also fall within the scope of the control of restrictive agreements.[71]

Paradoxically, the fact that the U.S. and the EU have used different policy instruments to deal with tying (control of restrictive

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[70] The Justice Department and nine states entered into a consent decree with Microsoft that the court approved after a Tunney Act hearing. Nine states and the District of Columbia sought further relief that was denied. Two of those nine states are pursuing an appeal. However, since all plaintiffs agreed to drop the tying claim it would not appear that the claim could be the basis for any appeal to the Supreme Court. *See* Memorandum Opinion and Order, United States v. Microsoft, 2002 U.S. Dist. LEXIS 22861 (Nov. 12, 2002) (No. 98-1232); and Memorandum Opinion, Final Judgment, and Order, New York v. Microsoft Corp., 2002 U.S. Dist. LEXIS 22854 (Nov. 18, 2002) (No. 98-1233).

[71] *See, e.g.*, EUROPEAN COMMISSION, GUIDELINES ON VERTICAL RESTRAINTS (2000/C291/01).

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agreements under section 1 of the Sherman Act[72] in the U.S. versus the dominance provision under article 82[73] in the EU) has led to a close proximity of the two analytical frameworks. This is partly because the requirement of "sufficient market power" of the tying firm under U.S. law matches more closely the standard of dominance under EC law than the concept of monopoly power under section 2 of the Sherman Act.[74] Above the level of sufficient market power/dominance, both systems scrutinize tying arrangements.

A comparison between tying under U.S. and EC competition law, however, faces an important handicap, namely that the European Commission and the European Court have dealt with tying in a very small number of cases, none of which is particularly recent.

A. *EC case law*

1. DECISIONS The Commission has issued three negative decisions concerning tying.[75] All three involved contractual tying, two of which deal with the tying of consumables to the primary product.[76]

Napier Brown/British Sugar[77] The case arose from a complaint by Napier Brown, a sugar merchant in the United Kingdom, which alleged that British Sugar, the largest producer and seller of sugar in the U.K., was abusing its dominant position in an attempt to drive Napier Brown out of the U.K. sugar retail market. In the subsequent

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[72] *See* 15 U.S.C. § 1 (2002).

[73] *See* TREATY ESTABLISHING THE EUROPEAN COMMUNITY, 1997 O.J. (C 340) 173, at article 82.

[74] *See* 15 U.S.C. § 2 (2002).

[75] Napier Brown v. British Sugar, Commission Decision 88/519/EEC, 1988 O.J. (L 284) 41 [hereinafter *Napier Brown/British Sugar*]; Eurofix-Bauco v. Hilti, Commission Decision 88/138/EEC, 1988 O.J. (L 065) 19 [hereinafter *Eurofix-Bauco/Hilti*]; Tetra Pak II, Commission Decision 92/163/EEC, 1992 O.J. (L 072) 1 [hereinafter *Tetra Pak II*].

[76] *Eurofix-Bauco/Hilti*, *supra* note 75; *Tetra Pak II*, *supra* note 75.

[77] *Napier Brown/British Sugar*, *supra* note 75.

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proceedings, the Commission objected, among other things, to British Sugar's practice of offering sugar only at delivered prices so that the supply of sugar was, in effect, tied to the services of delivering the sugar.

Having concluded that British Sugar was dominant in the market for "white granulated sugar for both retail and industrial sale in Great Britain,"[78] the Commission took the view that "reserving for itself the separate activity of delivering the sugar which could, under normal circumstances be undertaken by an individual contractor acting alone"[79] amounted to an abuse. According to the Commission, the tying deprived customers of the choice between purchasing sugar on an ex factory and delivered price basis "eliminating all competition in relation to the delivery of the products."[80]

Eurofix-Bauco/Hilti[81] The *Hilti* case dealt with certain power-actuated fastening (PAF) systems, used in the construction industry. At the time of the investigation, Hilti was the largest manufacturer of nail guns in the European Union (with a share of a little over 50%). Nail guns use nails and cartridge strips, which are specifically adapted to a particular brand of nail gun. Hilti had patent protection for its guns, its cartridge strips and its nails.[82] This patent protection had not prevented, however, several manufacturers from producing a range of nails having similar characteristics for specific use in Hilti nail guns.

Competing nail producers complained to the Commission that Hilti was engaging in abusive actions that, they claimed, had severely limited their penetration into the market for Hilti-compatible nails.

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[78] *Id.* ¶ 60, at 47.

[79] *Id.* ¶ 71, at 46.

[80] *Id.*

[81] *Eurofix-Bauco/Hilti*, *supra* note 75.

[82] *Id.* Hilti's patent protection for nail guns was due to expire between 1986 and 1996, depending on the country and patent feature involved. Hilti also obtained patents for certain nails in all member states except Denmark. At the time of the investigation these patents had expired in some member states and were due to expire in all member states by 1988.

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These practices included, among other things, the tying of the sale of nails to the sale of cartridge strips, the refusal to honor guarantees where customers used third-party nails in their Hilti guns, the refusal to supply cartridge strips to customers who might resell them, and "frustrating or delaying legitimately available licenses of right available under Hilti's patents."[83]

In its analysis, the Commission identified three different product markets, namely (1) nail guns, (2) Hilti-compatible cartridge strips and (3) Hilti-compatible nails.[84] It took the view that Hilti was dominant in all three relevant markets.[85] The Commission then concluded that tying the sale of cartridge strips to the sale of nails constituted an abuse of the dominant position:

> These policies leave the consumer with no choice over the source of his nails and *as such* abusively exploit him. *In addition*, these policies all have the object or effect of excluding independent nail makers who may threaten the dominant position Hilti holds.[86]

The Commission also came to a conclusion of abuse regarding Hilti's restriction of its guarantee:

> Whilst it may be legitimate not to honour a guarantee if a faulty or sub-standard non-Hilti nail causes malfunctioning, premature wear or breakdown in a particular case, such a general policy in the circumstances of this case amounts to an abuse of a dominant position, in that it is yet another indirect means used to hinder customers from having access to different sources of supply.[87]

Hilti argued that its business practices were motivated by safety and reliability concerns. The Commission rejected these arguments in the circumstances of the case and, furthermore, questioned whether safety and reliability could ever be regarded as an objective justification for an otherwise abusive behavior.[88] Hilti appealed to the Court of First

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83 *Id.* ¶ 98.

84 *Id.*

85 *Id.*

86 *Id.* ¶ 75 (emphasis added).

87 *Id.* ¶ 79.

88 *Id.*

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Instance, which upheld the Commission's decision.[89] A further appeal by Hilti to the European Court of Justice was also unsuccessful.[90]

Tetra Pak II[91] This case also concerned the tying of consumables to the sale of the primary product. Tetra Pak, the major supplier of carton packaging machines and materials required purchasers of its machines to agree also to purchase their carton requirements from Tetra Pak. The Commission, upheld by the Court,[92] condemned the tying as abuse of a dominant position.

2. OTHER CASES In addition, the Commission has dealt with a number of tying cases in which the company under investigation abandoned the alleged tying behavior and no formal decision was taken. Of particular interest is the *IBM* case,[93] which raised the issue of product integration (or technological tying).

In December 1980, the Commission opened proceedings under article 82 (then article 86) into IBM's business practices with regard to its mainframe computers, the System/370. It alleged that IBM held a dominant position in the common market for the supply of the two key products for the System/370, namely the central processing unit (CPU) and the operating system, as a result of which IBM was able to control the market for the supply of all products compatible with the System/370. The Commission challenged, among other things,[94] IBM's integration of memory devices with the CPU and the bundling with the

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89 Case T-30/89, Hilti AG v. Commission 1990 E.C.R. II-163.

90 Case C-53/92P, Hilti AG v. Commission 1994 E.C.R. I-667.

91 *Tetra Pak II, supra* note 75.

92 Case T-83/91, *Tetra Pak II*, 1994 E.C.R. II-755.

93 EUROPEAN COMMISSION, FOURTEENTH REPORT ON COMPETITION POLICY point 94, [1984] 3 C.M.L.R. 147.

94 IBM was also accused of (a) failing to supply the manufacturers in sufficient time with the technical information needed to permit competitive products to be used with System/370; (b) not offering System/370 CPUs without the basic software included in the price (software tying); and (c) discriminating between users of IBM software, i.e. refusing to supply certain software installation services to users of non-IBM CPUs.

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basic software applications. In April 1983, the Commission started informal discussions with IBM in parallel with the formal proceedings; these informal discussions ultimately led to a settlement of the case. In August 1984, IBM undertook to offer its System/370 CPUs in the EU either without memory devices or with the minimum capacity required for testing[95] and the Commission accepted the IBM undertakings.

Soon after the settlement in the IBM case, the integration of the CPU and main memory devices as part of a single product became standard practice in the computer industry.

B. Analysis of tying under EC law

As mentioned earlier, it is difficult to assess the EC policy of tying on the basis of a mere handful of (slightly outdated) cases. Nevertheless, some conclusions can be drawn:

First, the European Commission and European courts seem to have adopted a "unified" approach to the different forms of tying, in other words, contractual tying (including the tying of primary products and consumables) and the integration of products have been assessed in the same way without taking into account the different underlying effects on competition and efficiency considerations (for example, the use of consumables as a metering device).

Second, there is little sign of any development of EC policy toward tying along the lines of U.S. antitrust. Nothing suggests that the position of the European Commission and the European courts has become less hostile over the years.

Third, the formal framework of the tying analysis is almost a carbon copy of the U.S. per se approach (both in relation to the first and second phase of U.S. case law), following a four-stage assessment:

1. To establish *market power* (dominance) of the seller in relation to the tying product;
2. To identify *tying* which means to demonstrate that (a) customers are forced (b) to purchase two separate products (the tying and the tied product);

[95] IBM also undertook to disclose, in a timely manner, sufficient interface information to enable competitors to produce IBM-compatible hardware and software.

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3. To assess the *effects of tying on competition*;
4. To consider whether any *exceptional justification for tying* exists.

As the U.S. experience has shown, the same overall framework may lead to different policies depending on the interpretation of the various elements. It is therefore necessary to take a closer look at how each of the stages has been assessed in practice.

1. MARKET POWER Article 82 of the EC Treaty is applicable only to the extent that the Commission is able to establish dominance in a particular market. Not surprisingly, in all tying cases, dominance in the market for the tying product has been a prerequisite for a finding of abusive tying: Tetra Pak was held to have abused its dominant position in the market of machines for packaging by tying the sales of cartons to the sales of their machines; British Sugar had abused its dominant position in the sugar market by tying distribution services to its sales of sugar.

It is worth noting, however, that in certain cases, the Commission has defined the market so narrowly (e.g. Hilti compatible cartridge strips) that a finding of dominance was inevitable. Furthermore, the Commission made clear that a finding of dominance in a market for consumables was not necessarily dependent on a finding of dominance in the primary market, as evidenced in *Hilti*:

> Even if it were correct as Hilti argues that nail guns form part of a wider market and compete with other fixing methods in general, this would not alter the analysis given above as far as the relevant markets for Hilti-compatible nails and cartridge strips in particular are concerned and Hilti's dominance thereof. For the independent producers of these consumables the relevant markets on which they compete are those for Hilti-compatible consumables.[96]

2. TYING Tying has been defined by the Commission as (a) bundling two (or more) distinct products,[97] and (b) forcing the customers to buy the product as a bundle without giving them the choice to buy the products individually.[98]

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[96] *Eurofix-Bauco/Hilti*, *supra* note 75, ¶ 72.

[97] *See* JONATHAN FAULL & ALI NIKPAY, THE EC LAW OF COMPETITION 166–67 (1999).

[98] *Id.*

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Separate products The example of abusive behavior in article 82 refers to "making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage have no connection with the subject of such contracts"[99] and the question of whether two products are separate is therefore generally assessed on the basis of "commercial usage."[100]

The Commission and the Court discussed the concept of "commercial usage" in detail in the *Tetra Pak II* case. Tetra Pak had argued that the tying of machines and cartons did not contravene article 82 on the basis that the products were connected by commercial usage. In support, Tetra Pak cited its competitor Elopak, which had stated that the combined sale of machine and cartons was a more efficient way of competing. Both the Commission[101] and the Court[102] held that the products were not linked by commercial usage. The Court based its view on the fact that there were "independent manufacturers who specialise[d] in the manufacture of non-aseptic cartons designed for use in machines manufactured by other concerns and who do not manufacture machinery themselves . . . approximately 12% of the non-aseptic carton sector was shared in 1985 between three companies manufacturing their own cartons, generally under licence and acting, for machinery, only as distributors."[103] The Court then continued, obiter dictum:

> Moreover and in any event, even if such a [commercial] usage were shown to exist, it would not be sufficient to justify recourse to a system of tied sales by an undertaking in a dominant position. Even usage that is acceptable in a normal situation, on a competitive market, cannot be accepted in the case of a market where competition is already restricted.[104]

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99 *See* TREATY ESTABLISHING THE EUROPEAN COMMUNITY, 1997 O.J. (C 340) 173, at article 82(2)(d).

100 *Id.*

101 *Tetra Pak II, supra* note 75.

102 *Id.*

103 *Id.* ¶ 82.

104 *Id.* ¶ 137.

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Two important points flow from the Court's assessment in *Tetra Pak II*. First, the Court seems to define commercial usage rather narrowly: to establish commercial usage it is not sufficient to show that tied sales are the predominant business practice in the markets in question (or comparable markets); as long as some untied sales occur in the relevant markets (in the *Tetra Pak II* case, 12%[105]), the criterion of commercial usage is not satisfied. Second, contrary to the express wording in article 82(d), the Court does not regard absence of commercial usage as a prerequisite for tying; rather, commercial usage seems to be treated similarly to "objective justifications" (see below) which may or may not take tying outside the scope of article 82.

Forcing Under EC law, as under U.S. law, coercion to purchase two products together is a key element to establish abusive tying. Coercion may take many forms. Coercion is clearly given where the dominant firm makes the sale of one good an absolute condition of another good. This condition may be explicit in an agreement (see, for example, *Tetra Pak II*) or de facto (see, for example, *Hilti*). However, lesser forms of coercion, such as price incentives or the withdrawal of benefits may also be sufficient, if they are so powerful that customers would not choose to buy products individually. An example is Hilti's refusal to honor guarantees where customers used third-party nails in their Hilti guns.

3. ANTICOMPETITIVE EFFECTS It is not clear to what extent it has to be demonstrated under EC law that tying leads to anticompetitive effects in a particular case.

According to the *British Sugar* case, tying does not need to have any significant effect on the tied market. British Sugar tied the supply of sugar to the service of delivering the sugar. The Commission did not regard it as necessary to assess whether the delivery of sugar was part of a wider transport market and whether the tying foreclosed any significant part of such market. The fact that British Sugar had "[r]eserv[ed] for itself the separate activity of delivering sugar"[106] was sufficient as an anticompetitive effect.

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105 *Id.* ¶ 82.

106 *Napier Brown/British Sugar, supra* note 75.

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In *Hilti*, the Commission went one step further. It took the view that depriving the consumer of the choice of buying the tied products from separate suppliers was *in itself* abusive exploitation: "These policies leave the consumer with no choice over the source of his nails and *as such* abusively exploit him."[107] In other words, as any tying by definition restricts consumer choice in the way described above, the Commission's position in *Hilti* strongly suggests that foreclosure does not have to be established and that, hence, tying is subject to a per se prohibition (with the possible exception of an objective justification).

4. OBJECTIVE JUSTIFICATION In principle, dominant firms accused of abusive tying may raise the defense of objective justifications. In practice, however, there is so far no example of a successful defense. Hilti, for example, argued that tying the sale of its nail guns to the sale of its nails enhanced the safety and reliability of the overall fastening system. The Commission rejected Hilti's justification on a number of grounds, focusing predominantly on the safety aspects:

1. The Commission regarded the existing safety controls and standards in the EU as adequate safeguards rendering Hilti's argument concerning safety invalid.[108]
2. The Commission argued that tying was not the least restrictive action necessary to attain the object of safety and that Hilti's behavior was not solely motivated by concerns over safety and reliability.[109]
3. Finally, the Commission argued that Hilti had "not been able to show any evidence of accidents to operators as a result of the use of these millions of nails produced by [Hilti's competitors]."[110]

Here, the small number of EC tying cases makes it very difficult to determine whether the threshold of an objective justification is particularly high or whether in the few cases under consideration the justification raised by the dominant firms were just not supported by facts.

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107 *Eurofix-Bauco/Hilti*, *supra* note 75, ¶ 75 (emphasis added).

108 *Id.*

109 *Id.*

110 *Id.* ¶ 93.

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IV. U.S. and EC tying law compared

A. *Where Europe stands . . .*

EC competition law uses almost the same analytical framework for tying as U.S. antitrust policy. This however does not mean that the EC approach toward tying is substantially the same as the U.S. approach. As U.S. antitrust has clearly demonstrated, the same framework allows for a wide range of different policies. Within the same four analytical steps, U.S. policy moved from a position of hostility under the per se illegal rule, which did not recognize any legitimate purpose for tying, to a modified per se illegal approach, which at least implicitly accepted that tying even by firms with market power may be efficiency enhancing.

A closer look is required to see whether the underlying rationale of EC law with respect to tying is more in tune with *Jefferson Parish* or the early per se rule (or indeed reflects an approach which is different from both).

1. THE RELEVANCE OF PROXIES One of the key features distinguishing the modified per se approach from the early per se approach was the use of the separate-product test (or consumer demand test) as a proxy both for competitor harm (on the basis that no competitor of the tied good can be foreclosed if there is no separate demand for it) and, implicitly, for efficiencies (on the basis that firms without market power only tie products if the efficiencies from tying outweighs the loss of choice).

In principle, the criterion of "commercial usage" suggested by the wording of article 82 is capable of evaluating competitor harm and efficiencies in much the same way as the consumer demand test does in the U.S. In *Tetra Pak II* however, the Court made clear that it did not consider the "commercial usage" criterion as a proxy for efficiencies or consumer harm.[111] In fact, the Court's statement that "[e]ven [commercial] usage [of bundled products] . . . which may be acceptable in a normal situation, on a competitive market, cannot be accepted in the case of a market where competition is already

[111] *Tetra Pak II*, *supra* note 92.

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restricted,"[112] demonstrates that it will not consider such a possibility. If taken at face value, this statement (namely that the separate-product test is not a necessary precondition to establishing tying) would result in a policy toward tying that would be not only more draconian than *Jefferson Parish*'s modified per se rule, but even considerably harsher than the strict U.S. per se rule that prevailed until 1984.

As far as the requirement to establish an adverse effect on competition is concerned, the position is a mirror image of the separate-product test. *Jefferson Parish* has raised the threshold of abusive tying from the mere de minimis standard of a "not insubstantial amount of commerce"[113] under the early per se rule to "a substantial potential for impact on competition."[114] EC competition law, again, is much closer to the early per se rule than to *Jefferson Parish*. Under EC law a reduction in consumer choice in itself seems to be abusive, which suggests that no foreclosure (de minimis or otherwise) has to be demonstrated.

2. SUMMARY OF EC AND U.S. COMPARISONS A direct comparison of EC and U.S. competition law of tying leads to a number of conclusions.

First, a comparison of the underlying principles of U.S. and EC law in respect of tying suggests that EC law is in many respects much closer to the early U.S. cases under the per se approach than to the more recent U.S. cases since *Jefferson Parish*. The exception is the EC assessment of market power, which is more closely related to the modified per se approach. This, however, is more a reflection of the use of a different policy instrument than the particular policy against tying.

Second, in Europe a literal interpretation of the principles set out by the Court and the Commission would lead to an extremely wide definition of abusive tying. A dominant car manufacturer, for example, who does not offer his cars without engine or shock absorbers, i.e. who bundles the various car components, clearly risks contravening article 82, despite the fact that all other nondominant

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112 *Id.* ¶ 6.

113 Jefferson Parish Hospital Dist. No. 2 v. Hyde, 466 U.S. 2, 16 (1984).

114 *Id.*

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manufacturers act in the same way (*Tetra Pak II*) and that this does not foreclose any component manufacturer (*British Sugar*).

Third, the cases in which tying has been found to be abusive under EC competition law are less extreme than the principles on which the prohibitions have been based. In other words, most of the bold statements of principle were made obiter dicta.

B. . . . And why

There are a number of possible explanations for the position of EC competition policy in relation to tying and the divergence with respect to the current U.S. approach.

First, in Europe it has taken longer for new developments in economic theory to affect competition policy. While U.S. antitrust has been influenced by Chicago school and post-Chicago school theories, pre-Chicago school considerations still play a role in Europe, albeit at times dressed up in post-Chicago clothing. The Commission's statement of objections and decision concerning General Electric's proposed acquisition of Honeywell was telling. As Evans and Salinger point out:

> the DG-Comp's analysis reflects a reversion to pre-Chicago thinking in which some courts presumed that a harm to competitors necessarily resulted in a harm to competition and consumers. Whether dressed up in a formal model or not, both ultimately come down to that what is bad for a competitor must be bad for competition.[115]

Second, EC competition law imposes a "special responsibility"[116] on dominant firms not to allow their conduct to impair undistorted competition. This special responsibility facilitates the finding of an abuse; in particular it seems to make it easier to reach the conclusion that behavior that is efficient, if carried out by a firm with market power, is harmful to competition if undertaken by a dominant firm without the competition authorities assessing in detail whether the behavior of the dominant firm might be efficiency enhancing.

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[115] David S. Evans & Michael Salinger, *Competition Thinking at the European Commission: Lessons From the Aborted GE-Honeywell Merger*, 10 GEO. MASON L. REV. 489, 520 (2002).

[116] Case 322/81, Michelin v. Commission, ¶ 10 [1983] E.C.R. 3461.

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Third, the administrative proceedings under EC law provide greater control in the selection of tying cases than the court-based U.S. system. The wide definition of abusive tying coupled with the small number of negative decisions suggests that the Commission uses implicit "prescreening" criteria that are not reflected in a comparison of the explicit assessment criteria.

At this stage, it is difficult to determine which of the possible explanations is actually correct. The next Commission or Court decision on tying may provide an answer.

V. Lessons from economic theory and evidence

Modern economic thinking largely supports the adoption of the rule of reason approach to the analysis of tying cases adopted by the D. C. Circuit Court of Appeals with respect to software in *Microsoft III*. The economic literature shows that tying typically generates consumer benefits or lowers production costs. The same literature also shows that tying creates anticompetitive effects meriting regulatory intervention in special circumstances; those circumstances have been identified as special cases of models that themselves are based on stylized assumptions.[117] In the following sections we will review the history of economic contributions that have led to this consensus.

A. The Chicago school

A few decades ago, economists associated with the Chicago school[118] explained how tying could provide increased convenience

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[117] For an alternative discussion of the economic theory of tying, *see* Eric Emch, *Portfolio Effects in Merger Analysis: Differences Between the EU and U.S. Practice and Recommendations for the Future,* in this issue of *The Antitrust Bulletin.*

[118] *See, e.g.*, Aaron Director & Edward H. Levi, *Law and the Future Trade Regulation*, 51 Nw. U. L. Rev. 281 (1956); George J. Stigler, The Organization of Industry (1968); Richard A. Posner, Antitrust Law: An Economic Perspective (1976); and Bork, *supra* note 1.

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and lower transaction costs.[119] They also showed that, as a matter of theory, there are many circumstances in which businesses cannot use tying to leverage a monopoly position in one market in order to secure extra profits elsewhere—a result known as the single monopoly profit theorem. In short, the Chicago school claimed that tying conduct produces many benefits from a social viewpoint, at no competition cost, and that it should therefore be treated as per se legal.

1. THE WELFARE INCREASING EFFECTS OF TYING *(a) Reduction in production and distribution costs* Tying may give rise to both economies of scale and scope in production and distribution. For example, machines may be utilized to manufacture two or more products allowing the producer to reduce the size or complexity of its factories. Also, the specialization of labor allows manufacturers to combine the various products that are part of the tie or bundle more efficiently than end users would do. Not so long ago, for example, electrical appliances and plugs were sold separately in Europe. Such a commercial practice was everything but user-friendly or efficient.

Marketing and distribution costs may also be reduced when various products or services are combined. In media markets, for example, economies of scope between delivery infrastructures and content allow cable operators and asymmetric digital subscriber line (ADSL) providers to bundle Internet access, pay-TV and telephony, in what is known as a triple play. The software industry provides another useful example of these types of savings. Indeed, learning-by-doing and other scale effects of integrated software make industry vendors more efficient assemblers than consumers and able to take advantage

[119] Chicago economists also noted that tie-ins can be used to accomplish price discrimination. Economic theory has shown that price discrimination can, in principle, be pro- or anticompetitive, depending upon a series of structural factors, but that it is most often welfare increasing. *See* DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION 289–91 (3d ed. 2000). Hence, tying practices aimed at facilitating price discrimination should be typically considered welfare increasing and thus procompetitive. This is more or less the case under U.S. law; however, EC competition law treats price discrimination as nearly per se illegal. *See* RICHARD WHISH, COMPETITION LAW 657–62 (4th ed. 2001).

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of joint manufacturing and joint shipment of software products that might otherwise be distributed separately.[120]

(b) Reduction in transaction costs Tying reduces the costs of searching for the most appropriate combinations of products that satisfy a complex need. And it greatly simplifies use. At one time, software technologies such as tool bars, modem support, power management and sound were all formally offered as stand-alone products. Today, they are universally offered as an integrated, "bundled" part of the operating system. The widespread use of bundled software is itself a function of better technology—faster speed and expanded memory. But, perhaps most importantly, it is a response to consumers who value the ease of use of bundled software.[121] This is not the only example of reduced transaction costs through tying or bundling. While over the last few years many consumers have gained considerable experience with selecting and purchasing stocks and other financial products online, most individual consumers still opt for a financial service "bundle" composed of stock selection, purchase, and financial advice.[122]

(c) Product improvement When products are tied or bundled, the whole may be worth more than the sum of its parts; the resulting combined product offers benefits to consumers above and beyond the individual components added together. To take a simple example, today consumers enjoy breakfast cereals featuring a dizzying array of

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[120] *See* Steven J. Davis, Kevin M. Murphy & Jack MacCrisken, *Economic Perspectives on Software Design: PC Operating Systems and Platforms*, *in* MICROSOFT, ANTITRUST AND THE NEW ECONOMY 361 (David S. Evans ed., 2002), for an explanation of the forces and factors that determine whether and when new features and functions are included in commercial operating systems products.

[121] *See* David. S. Evans, A. Jorge Padilla & Michele Polo, *Tying in Platform Software: Reasons for a Rule of Reason Standard in European Competition Law*, 25 WORLD COMPETITION 509 (2002).

[122] According to Jupiter Communications—an information-technology consulting company—in 2002, almost a third of all stock trading would take place over the Internet. *See* Annelia Wynyard & David Snow, *The Online Trading Trade Off*, TECH TV, Oct. 7, 1998 (visited Feb. 13, 2003) http://www.techtv.com/news/print/0,23102,2144866,00.html.

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combinations of ingredients (fruits, nuts, grains); shapes (flakes, squares, doughnuts); textures; and tastes. For example, Apple-Cinnamon Cheerios is simply a bundle of grains, shaped into crunchy doughnuts, and flavoring (apple and cinnamon). Arguably, this product is an improvement over the first cereal products mass-produced at the turn of the 19th century, and an improvement to the consumer in terms of convenience and health benefits from assembling all the ingredients for the cereal herself. According to an econometric study, the introduction of Apple-Cinnamon Cheerios in 1990 into the U.S. market increased consumer welfare by approximately $66.8 million per year.[123] Likewise, other studies have shown that the introduction of the minivan—a product based on assembling the components of existing products (trucks and cars)—in the mid-1980s resulted in consumer welfare gains of approximately $560 million per year.[124]

(d) Quality assurance Because firms bring skill, knowledge, experience, and other resources to tying or product integration, allowing consumers to assemble the individual components themselves may affect the quality of the final product to the detriment of both producers and consumers. For example, in earlier decades of the electronics industry, hobbyists and other interested consumers could find the component parts of radios and other simple electronic equipment and with some effort, assemble them by themselves. However, with the increasing sophistication—miniaturization, digitization, and other complexities—of electronics equipment, it is nowadays more difficult to ensure that the final product will meet with consumer satisfaction. When the consumer assembles the product, it may not be clear if any malfunctions are the fault of the consumer or the component suppliers. Equipment manufacturers may

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[123] This figure is $97 million in 2002 U.S. dollars. Jerry A. Hausman, *Valuation of New Goods Under Perfect and Imperfect Competition, in* THE ECONOMICS OF NEW GOODS 209, 234 (Timothy F. Bresnahan & Robert J. Gordon eds., 1997).

[124] This figure is $1.01 billion in 2002 U.S. dollars. Anil Petrin, *Quantifying the Benefits of New Products: The Case of the Minivan*, 110 J. POL. ECON. 705, 728 (2002).

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suffer from an undeserved reputation for poor quality, and it may be more difficult for consumers to identify substandard manufacturers. Bundling components together gives both the consumer and the producer more certainty regarding product quality.

(e) Pricing efficiencies Augustin Cournot showed, in work published in 1838, that a firm monopolizing the markets for two complementary products would charge lower prices than would two separate monopolists each selling a different product.[125] That is, complements may be priced lower if offered by the same firm in a bundle. This is similar to the well-known "double marginalization" problem in the analysis of vertical integration, where a monopoly provider of two goods at different levels of supply will maximize its profits across the two goods, while separate providers will price each good at the individual profit-maximizing price.[126]

In media markets, for example, "in an unbundled system, a change in the price charged to subscribers for a given program service will affect not merely the demand for that service but also the demand for transmission, and possibly the demand for complementary program services," making it more efficient to bundle content with delivery.[127]

(f) A practical example A simple empirical example[128] can help us to illustrate the benefits of offering an integrated product to consumers. When suffering from cold or influenza, consumers face a number of choices with regard to over-the-counter or nonprescription medications. Many products are available for each individual symptom of nasal congestion, coughing, pain, or fever. In addition to products intended to relieve each symptom individually, there are also multisymptom products that aim to relieve all cold and flu symptoms.

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125 AUGUSTIN COURNOT, RECHERCHES SUR LES PRINCIPES MATHEMATIQUES DE LA THÉORIE DES RICHESSES (1838).

126 JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 333–35 (1988).

127 BRUCE M. OWEN & STEVEN S. WALDMAN, VIDEO ECONOMICS 219 (1992).

128 David S. Evans & Michael Salinger, *Quantifying the Benefits of Bundling and Tying* (Working Paper, 2002).

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Consumers of the "bundled" medicine benefit from the low prices resulting from savings in marketing and packaging. Indeed, the price of a single multisymptom product relieving fever, pain and congestion in a major U.S. city is $9.29, whereas the overall cost of a combination of products that relieve the same symptoms ranges from $14.48 to $15.48.[129]

Those are not the only savings associated to bundling, however. Bundling also provides increased convenience as consumers need not bother about which combination of medicines they need—they just purchase the package labeled "Cold and Flu Medicine" and waste no time.

2. THE SINGLE MONOPOLY PROFIT THEOREM The second central insight of the Chicago school is that a firm enjoying monopoly power in one market (the market for the tying good) could not increase its profits, and instead could reduce them, by monopolizing the market for another good (the market for the tied good). This idea is commonly referred as the "single monopoly profit theorem," and in principle applies to cases where the demands for the two goods are both independent and complementary. This theorem does not say that monopolists will not engage in tying and bundling. Nor does it say that monopolists cannot make greater profits by tying and bundling. Rather, what it says is that monopolists cannot secure greater profit merely by leveraging their monopoly from one market to another and that they must be engaging in tying and bundling to improve quality or lower cost (i.e. improve efficiency).

The intuition behind this result is simple. Consider first the case where the demands for the two goods are independent, so that the quantity demanded by consumers of one of the goods is independent of the price of the other. In that case, tying a competitively supplied good to a monopolistically supplied good is like establishing a tax on the latter. This tax would reduce consumption of the monopoly good unless consumers like the competitively supplied (tied) good and the monopoly prices the tied good competitively; i.e., unless the monopoly makes no rents from the tied market.

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[129] Holding dosage, ingredients, and delivery system (tablets, capsules, etc.) constant.

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If the demands for the two goods were, instead, complementary and the two products were consumed with fixed ratios,[130] a monopolist could only benefit from the tied good being competitively supplied, since all of the monopoly rents available in the two markets could be captured by a monopoly in one of them.[131] Richard Posner illustrated this result with a simple example:

> Let a purchaser of data processing be willing to pay up to $1 per unit of computation, requiring the use of one second of machine time and ten punch cards, each of which costs 1 cent to produce. The computer monopolist can rent the computer for 90 cents a second and allow the user to buy cards in the open market for 1 cent a card or, if tying is permitted, he can require the user to buy cards from him at 10 cents a card—but in that case he must reduce his machine rental charge to nothing, so what has he gained?[132]

Most strikingly, perhaps, under those same circumstances, if the monopolist faced competition from a more efficient firm in the tied market, it could do no better than abandoning the market for the tied good while, at the same time, raising the price of the monopoly good.

B. Post-Chicago theories

The contribution of the Chicago school to the tying doctrine was to give the efficiency motivations described above their proper place in antitrust analysis, and to reorient the thinking of competition authorities toward understanding that tying and bundling behavior was likely to be procompetitive as a result of reducing cost or improving quality. In the 1990s, however, the so-called post-Chicago economic

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130 The single monopoly profit theorem fails to hold when the two goods are consumed in variable proportions. Trying to extract the rents generated in the tied market through the pricing of the monopoly product is not a valid strategy in that case, since consumers would substitute away from the monopoly product. However, that does not imply that tying is necessarily anticompetitive when goods are consumed in variable proportions. On the contrary, it is precisely under such kinds of consumer preferences that the monopolist has an interest in tying to price discriminate efficiently. See *supra* note 119.

131 BORK, *supra* note 1.

132 POSNER, *supra* note 118, at 173.

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literature showed that the single profit monopoly theorem is not as robust as the Chicagoans suggests. The theorem depends, at least in its most extreme form, on the assumption that the tied market is "perfectly" competitive.[133] When that is not true, the theorem *may* fail.

Economists developed a series of highly stylized models to try to understand the competitive implications of tying and bundling when the structure of the tied market is oligopolistic, rather than perfectly competitive. They showed that a firm enjoying monopoly power in the tying good might have an anticompetitive incentive to tie when the tied good market is imperfectly competitive if, *in addition*, tying keeps potential rivals out of the market for the tied product or, alternatively, helps the monopolist to preserve its market power in the tying product.

The basic mechanism that leads to the exclusion of actual and potential competitors from the tied good is "foreclosure;" by tying the monopolist deprives its competitors in the tied good market of adequate scale, thereby lowering their profits below the level that would justify remaining active (or, alternatively, entering) in that market. This section proceeds with a detailed summary of the main papers of the post-Chicago school.

1. EXCLUSION AND ENTRY DETERRENCE IN THE TIED GOOD MARKET

Whinston's 1990 *American Economic Review* article is the seminal paper of those that formally analyzed the conditions under which the single profit monopoly theorem may fail to hold.[134] This paper shows that leveraging a monopoly position in the tying market onto an adjacent (tied) market may be privately profitable when the tied market is subject to economies of scale and, therefore, it is imperfectly competitive, and leveraging successfully induces the exit (or deters the entry) of competitors in the tied market.

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[133] Even if both markets are monopolized, welfare could still be enhanced through elimination of the double marginalization problem or through price discrimination. The critical observation here is that consumers can benefit even when tying and bundling are conducted by a firm with market power.

[134] Michael D. Whinston, *Tying, Foreclosure and Exclusion*, 80 AM. ECON. REV. 837 (1990).

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Suppose, for example, that a firm selling two goods, *A* and *B*, enjoys a monopoly position in the market for product *A* but faces competition (actual or potential) in the market for product *B*. Suppose also that the demands for products *A* and *B* are independent, so that the quantity sold of each of them is independent of the price of the other. If the monopolist in market *A* were to tie its two products, it effectively would be linking its sales of product *A* to the sale of product *B*. As a result its incentive to price *B* aggressively would be greatly increased. Tying, therefore, would lead to lower prices for product *B*. It would also lead to lower profits in the market for this product. Both the monopolist's and its competitors' profits from the sale of product *B* would fall, but the impact on the latter would be far greater. This is because tying would allow the monopolist to capture sales from its competitors, which in the presence of economies of scale in production would make them less effective competitors. The reduction in profits may induce the monopolist's competitors to exit the market for product *B*, or not to enter into it if they were potential competitors. In those cases, tying could both increase the monopolist's profits and harm consumers.

Like any other game-theoretic analysis, Whinston's model is notoriously fragile; minor changes in assumptions can lead to dramatic differences in results. Most importantly, Whinston's leveraging result requires that (a) the monopolist of product *A* be able to commit to tying and (b) tying leads to market foreclosure. Otherwise, the monopolist's strategy would be self-defeating. Tying would just serve to increase the intensity of price competition in the market.

The leveraging result also depends on the interrelationship between the demands for the two goods. Monopolizing the tied market might lead to lower sales and lower prices in the monopoly market when the two goods are complements and tying causes the exit (or prevents the entry) of more efficient producers of good *B*.[135] In that case, the incentives to tie would be reduced. Alternatively, the incentives to tie would be greater if consumers' valuations for the tying and tied goods were positively correlated.

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[135] Or, in the context of product differentiation, of higher quality versions of product *B*.

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Since 1990, various authors have developed models that aim to relax the conditions under which tying may turn out to be anticompetitive. Nalebuff, for example, constructed a model where a firm producing goods *A* and *B* has a "credible" incentive to tie them together in order to deter entry.[136] In contrast to Whinston's model, tying makes entry more difficult, not because the monopolist is committed to a price war, but because it deprives the entrant of an adequate scale. Credibility is not an issue here because even when entry is not foreclosed, the price for good *B* and the monopolist's profits are higher with a tie than without. The intuition is as follows. As in Carbajo, De Meza and Seidman,[137] in Nalebuff's model tying becomes a way for the competing firms to differentiate their products and thus relax price competition. The monopolist sells both *A* and *B* tied together, whereas the entrant sells only product *B*. The monopolist attracts those customers with a high valuation for both *A* and *B* and charges them a high price, while the entrant sells to those consumers of good *B* who have a low valuation for good *A* and charges them a low price.

2. PROTECTING MONOPOLY RENTS IN THE TYING GOOD MARKET Carlton and Waldman[138] argue that the logic behind leveraging a monopoly position onto another market through tying may not be to increase profits in that (competitive) market, but to deter future entry into the monopoly (tying) market. In the Carlton-Waldman model, there are two goods: the primary good (the tying good or monopoly product) and a complementary good (the tied good). The primary good can be used by itself. The complementary good can be used only in conjunction with the primary good.[139] Their theory is built on the assumption that potential competitors may refrain from entering

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136 BARRY NALEBUFF, BUNDLING (Yale ICF Working Paper #99-14, 1999).

137 José Carbajo, David De Meza & Daniel Seidman, *A Strategic Motivation for Commodity Bundling*, 38 J. INDUS. ECON. 283 (1990).

138 Dennis W. Carlton & Michael Waldman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries*, 33 RAND J. ECON. 194 (2002).

139 The authors cite as an example a computer (primary good) and a printer (complementary good).

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the monopoly market if they face the incumbent as its sole complementary good producer. The monopolist, therefore, has an incentive to monopolize the tied good in order to protect its rents. Entry into the tying market obviously would dissipate some of the rents made in that market. But it would also make it impossible to extract rents from the market for the complementary good, as the incumbent would find it costly to raise its price in the tying market because of the competition from the newly established entrant.

The incentives of the incumbent to monopolize the complementary good market may exist even when entry is costless provided there were network externalities in that market, i.e., consumers' valuations for the complementary good were an increasing function of the number of other users. Carlton and Waldman showed that tying the complementary good to the monopoly product gives the monopolist a head start in the race to become the standard in the market for the complementary good market. This incentive exists because the incumbent sees its monopoly position in the primary good market subject to the threat of entry. Otherwise, it would prefer to have competition in the complementary good market, so as to ensure the adoption of the best standard and to appropriate the rents generated by that standard via a higher price in the primary product market.

Notwithstanding its conceptual simplicity, the validity of the theory developed by Carlton and Waldman relies on a number of strong assumptions that do not always fit well with the facts of the markets under scrutiny. First, Carlton and Waldman's theory requires that entry into the tied market be very costly. Otherwise, the strategy of foreclosure could be defeated by the simultaneous entry into the two complementary markets. Second, their theory does not fare well when the product sold in the monopoly market has a life of its own, i.e., when some consumers have a demand for the monopoly good only. In this case the profitability of entry in the monopoly market is much less affected by the monopolization of its complementary market.

3. POST-CHICAGO THINKING ENDORSES A RULE OF REASON APPROACH

The post-Chicago models developed so far raise substantial objections to the validity of the Chicago school's assertion that tying should be legal per se. Yet, those models do not provide support for a per se prohibition of tying by dominant firms. They establish the theoretical

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possibility of anticompetitive tying, but do not conclude that tying is anticompetitive in general, or that it is likely to be anticompetitive in practice. Indeed, the post-Chicago literature has not questioned that tying may in many circumstances—including those where the single monopoly profit theorem fails to hold—be welfare enhancing.[140]

VI. Whither tying law?

As we saw in previous sections, U.S. tying law has evolved over the past decades from a per se prohibition, based on the presumption that the motive for tying is to leverage market power, to a modified per se rule under *Jefferson Parish* and a rule of reason inquiry in connection with technological integration under *Microsoft III*. Meanwhile, EC law on tying remains anchored in the classical (pre-Chicago) tying doctrine that supports a per se prohibition standard.[141]

None of this is satisfactory. As Hylton and Salinger note in a recent paper, "From an economic standpoint, . . . there is no basis for a per se rule, even given the conditions established in *Jefferson Parish* for triggering the rule."[142] Indeed, the principal implication of several decades of economic investigation on the competitive effects of tying is that there should be *no* presumption on the part of competition authorities that tying and bundling are anticompetitive, even when undertaken by firms with monopoly power.

Although recent developments in economic thinking, such as the post-Chicago models of anticompetitive tying, have provided several examples of situations where these activities may be anticompetitive, they do not disturb the consensus view that tying

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[140] In a recent study for the U.K's Department of Trade and Industry, Nalebuff suggests a similar conclusion. *See* BARRY NALEBUFF, BUNDLING, TYING AND PORTFOLIO EFFECTS (DTI Economics Paper No. 1, Part 1—Conceptual Issues (Feb. 2003)).

[141] *See, e.g.*, Evans & Salinger, *supra* note 115, at 489. Evans & Salinger use the *GE/Honeywell* decision as "a springboard for exploring European thinking about competition and its place in the economy."

[142] Keith N. Hylton & Michael Salinger, *Tying Law and Policy: A Decision-Theoretic Approach*, 69 ANTITRUST L. J. 469, 470–71 (2001).

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and bundling are a constant feature of economic life, and that the primary motivations for this form of strategic behavior are the realization of substantial efficiencies that lead to both higher profits and increased consumer welfare. Those models, therefore, should be interpreted as supportive of a rule of reason approach to the antitrust analysis of tying cases.[143]

A. *Implementing a (structured) rule of reason approach*

Unfortunately, the game-theoretic models developed by post-Chicago economists do not provide a universally valid set of conditions that could be used by competition authorities as a safe checklist in their rule of reason analyses of tying. What these models do suggest is a series of screens for determining whether antitrust authorities should investigate and ultimately condemn a tying arrangement. First, economic theory shows that tying cannot plausibly have anticompetitive effects unless, *inter alia*, a firm has significant market power in the tying market and faces imperfect competition in the tied market. We can screen those cases from further consideration. Second, it is possible to construct models—or stories—in which tying can prove anticompetitive. However, those models are based on assumptions that one would need to verify through examination of the facts for a particular matter. We can eliminate some tying cases because the explanations for how those ties may cause anticompetitive harm do not withstand factual scrutiny. Third, there is a class of tying cases for which it is plausible, given the factual circumstances, that the ties reduce competition. However, those ties, like most ties, may increase efficiency by lowering costs or improving quality. For those "questionable" ties one needs to balance anticompetitive against procompetitive effects to determine whether these ties, on balance, harm consumers.

1. FIRST SCREEN: IS AN ANTICOMPETITIVE EFFECT *POSSIBLE*? The first screen is whether it is possible that the tying practice in question

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143 *See, e.g.*, Patrick Rey, Paul Seabright & Jean Tirole, *The Activities of a Monopoly Firm in Adjacent Competitive Markets* (INSTITUT D'ECONOMIE INDUSTRIELLE, UNIVERSITÉ DE TOULOUSE I, Working Paper, 2001).

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could have anticompetitive effects.[144] The models described in section V.B above provide a set of conditions that are necessary for tying to have anticompetitive effects. Yet a tie that meets those conditions does not necessarily give rise to anticompetitive effects. Further conditions need to be verified—those additional tests form part of the second screen.[145]

The seven conditions identified for a first screen from the literature are:

(1) Market power for the tying firm The degree of market power for the tying firm in the tying market should be the first step of any inquiry into tying and bundling.[146] Without market power, the tying firm either has no anticompetitive incentive to bundle, or its aim to exclude competitors by means of tying and bundling will be thwarted by its competitors. However, market power alone is often not enough—a firm may need to possess a near-monopoly in the tying market in order to overcome the difficulties in effecting an anticompetitive tie in the face of competitive threats.[147]

(2) Status of competition in the tied market As we saw above, models of anticompetitive tying assume that the tied market is imperfectly competitive;[148] i.e., it is populated by a "few" firms facing

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[144] That is, tying is privately profitable *but* potentially detrimental from a social viewpoint.

[145] In the language of formal logic, the conditions listed below are not necessary (and much less sufficient) for tying to be anticompetitive.

[146] Paul Seabright, *Tying and Bundling: From Economics to Competition Policy,* Edited Transcript of a CNE Market Insights Event, Sept. 19, 2002 (visited Feb. 13, 2003) http://www.centrefortheneweurope.org/pub_pdf/09192002_tying_bundling.htm.

[147] Otherwise, (a) the tying firm may not benefit by as much from the exclusion of its competitor(s) in the tied market, or (b) its competitors in the tied and tying markets may cooperate to match the tie, thus defeating the exclusionary purposes of the tying firm. *See* Whinston, *supra* note 134.

[148] Otherwise, the Chicago's one monopoly profit theorem likely will hold.

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positive fixed costs. Through tying the monopolist steals the business of its competitors in the tied good market, reducing their revenues below the level needed to cover their fixed costs. In a perfectly competitive market (with no fixed costs), such exclusionary activities would be inconsequential.[149]

(3) Commitment to tie As shown by Whinston, tying two goods together may prompt aggressive pricing responses by rivals, which would yield lower profits to all market participants, including the tying firm. The tying firm, consequently, must be able to show its rivals that it is committed to bundling even in the face of lower profits and until competitor exit is achieved. Without such a commitment, tying may not be credible and may fail to generate anticompetitive effects. Note, however, that credibility need not be an issue when consumers have heterogeneous valuations for the tying good.[150]

(4) Competitor's inability to match the tie Tying may not allow the near-monopolist to profitably leverage its market power in the tying good onto the tied good market if its competitors were able to respond with bundles of their own.[151]

(5) Likelihood of competitor exit Anticompetitive tying may be privately profitable if it leads to market foreclosure. However, exit may be difficult to predict, as its likelihood depends on (a) the demand links between the tying and tied goods (complementarity of products, positive/negative correlation between consumers' valuations for the two goods); and on (b) market conditions that go beyond the use of tying strategies; e.g., the degree of product

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149 *Id.*

150 *See* Nalebuff, *supra* note 136.

151 *See* BARRY NALEBUFF, COMPETING AGAINST BUNDLES (Yale School of Management Working Paper #7, 2000). Nalebuff shows that, under certain conditions, competitors may not match the bundle of the incumbent even when they have the ability to do so. And in some other cases, matching tying may turn out to be inefficient even if it prevents market foreclosure.

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differentiation, the size of the competitor's overheads, its debt capacity, etc.[152]

(6) Entry barriers Even if some competitors exit the tied good market, without entry barriers it is unlikely that the tying firm would be able to raise price, as new competitors would quickly enter and erode any anticompetitive rents. This is more likely to occur in industries subject to rapid technological change.

(7) Absence of buyer power Buyer power can prevent the tying firm from profiting from an anticompetitive tie. Even if some competitors exited the tied good market, and entry barriers were sufficient to preclude new entry, a tying firm facing a concentrated demand side would not be able to raise the price of its bundle.[153]

These criteria are not empirically demanding. They entail investigations into market structure in which economists routinely engage. Ties that do not pass through this screen would need to be subjected to a second screen—a further analysis to determine whether they are likely to have anticompetitive effects. Although we have characterized these as necessary conditions, we believe some flexibility is in order. None of those conditions have binary values—either the condition holds or it does not. For example, if the first six conditions held but there was buyer market power one would ask whether that power was truly sufficient to defeat a tying strategy.

In practice, the critical issues are likely to be whether the firm has significant market power in the tying market and faces imperfect competition—a small number of firms and entry barriers—in the tied market.[154] If it does not, an anticompetitive tie is not plausible. Since

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[152] In Carlton & Waldman, privately profitable tying may give rise to anticompetitive effects even if competitors do not exit the market provided that they become "sufficiently" marginalized. Carlton & Waldman, *supra* note 138.

[153] *See* BARRY NALEBUFF, BUNDLING AND THE GE-HONEYWELL MERGER (Yale School of Management Working Paper #22, 2002).

[154] This screen must be preceded by a careful market definition analysis to identify the precise boundaries of the tying and tied markets and the competitive constraints faced by the companies operating in each of them.

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the likelihood and cost of a false acquittal are low, why take the risk of a false conviction!

2. SECOND SCREEN: IS AN ANTICOMPETITIVE EFFECT *PLAUSIBLE*? Let us suppose market circumstances make it possible that tying *might* have an anticompetitive effect. The next question is whether the tying arrangement under consideration is *likely* to have an anticompetitive effect. Like the first screen, this question can be addressed only by examining the factual circumstances of the market at issue. Unlike the first screen, this question can only be answered by positing a "theory" concerning how the tying arrangement will lead to anticompetitive effects and determining whether that "theory" applies to the factual circumstances at hand. Let us not overstate the requirements—one does not need to have a fully specified mathematical theory of tying that has been published in an economic journal. But one does have to have a theory that can be confirmed or falsified by testing the theory against facts.[155] In some cases, it will be possible to take a theory "off the shelf." In other cases, it will be necessary to develop a theory that is customized to the facts of the case including the relevant business and possibly government institutions.

Let us suppose that the Carlton-Waldman model has been suggested as the appropriate framework for evaluating a particular tying arrangement. In their model, anticompetitive leverage result holds only if (a) entry into the (tied) complementary good market is costly or, alternatively, the tied good market is characterized by network externalities; (b) consumers receive no utility from consuming either a primary unit by itself or a complementary unit by itself; (c) if the two products are tied, a consumer cannot undo the

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155 We have encountered a number of situations in which some participants in a case leap from the proposition that tying could be anticompetitive to the conclusion that tying is anticompetitive without checking whether the assumptions made by the theory hold in the matter at hand.

156 That is, if the consumer purchases a bundle consisting of one unit of the monopolist's primary good and the one unit of its complementary good, then the consumer cannot add a unit of the potential entrant's complementary good to the bundle.

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tie;[156] and (d) the potential entrant cannot enter the markets for the primary and complementary goods simultaneously.

Determining whether these conditions hold is an empirically demanding task. For example, in order to conclude that tying generates anticompetitive effects in the context of the model developed by Carlton-Waldman, one needs to verify that the parameters of the model—e.g., the firms' discount factors and marginal costs of production, the sunk costs of entry into the primary and complementary goods markets, and the consumers' valuations for the various products offered by the monopolist and the potential entrant—are such that:[157]

1. The potential entrant's complementary product is of higher quality than the monopolist's complementary product.[158]
2. The primary market monopoly is more valuable to the monopolist than the potential benefits associated with having the alternative producer offer its higher-quality product.[159]
3. The potential entrant would enter the primary market if it previously had entered the complementary market.[160]
4. The potential entrant does not find it profitable to enter both markets simultaneously.[161]
5. If the monopolist does not tie, then the potential entrant would find it profitable to enter the complementary market first and the primary good market later.[162]

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[157] Likewise, the anticompetitive results in Whinston hold only for some parameterizations of the models that are hard to verify in practice. Further research is needed in this area so that we can move from "exemplifying theory" to a theory constructed around propositions establishing the general necessary and sufficient conditions for tying to be welfare reducing.

[158] Carlton & Waldman, *supra* note 138, at 198.

[159] *Id.* at 199.

[160] *Id.* at 204, equation (1).

[161] *Id.* at 204, equation (2).

[162] *Id.* at 204, equation (3).

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Conditions 1 to 5 hold for some parameterizations but not for all. Furthermore, those parameters are hard to estimate in practice. Ties that do not pass through this screen would need to be subjected to a third screen to determine whether there are offsetting efficiencies.

One might argue that we are raising the bar too high by insisting that there is empirical evidence that these conditions hold before concluding that a tying arrangement is anticompetitive. Unfortunately, there is no basis for inferring that a tying arrangement is anticompetitive unless these conditions do hold. Nor is there an a priori basis for believing that these conditions are likely to hold. One must confront the theory with the facts, as hard as this may be in some cases, to ascertain whether a tying arrangement has anticompetitive effects.

3. THIRD SCREEN: ARE THERE OFFSETTING EFFICIENCY BENEFITS? The third screen is whether there are efficiency benefits that offset the anticompetitive effects. This final screen requires determining whether the tie generates efficiencies (as most ties do) that can only be achieved through a tie, and whether these efficiencies are greater than the anticompetitive effects of the tie. In conducting this analysis one would need to consider dynamics and uncertainty. The anticompetitive effects demonstrated in the existing theoretical models take place over time—market foreclosure leads to exit which leads to higher prices. One therefore needs to discount these effects to reflect the fact that they occur in the future and are uncertain.[163]

Once again, this is an empirically demanding task, as Carlton-Waldman have recently explained:

> We would like to caution that trying to turn the theoretical possibility for harm . . . into a prescriptive theory of antitrust enforcement is a difficult task. For example, the courts would have to weigh any potential efficiencies from the tie with possible losses due to foreclosure, which by itself is challenging due to the difficulty of measuring both the relevant efficiencies and the relevant losses.[164]

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[163] A. Jorge Padilla, *The Efficiency Offence Doctrine in European Merger Control*, *in* INTERNATIONAL MERGER CONTROL: PRESCRIPTIONS FOR CONVERGENCE 117, 117–23 (William Rowley & Michael Reynolds eds., 2002).

[164] Carlton & Waldman, *supra* note 138, at 215 (citations omitted).

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B. The choice of legal standard

The best legal standard is, of course, one that perfectly ferrets out anticompetitive ties from procompetitive ones. Unfortunately, courts (and competition authorities) are only human and make errors. The possibility of errors in assessing tying arrangements is magnified when we confront fragile theories of tying with imperfect information concerning marketplace realities. As Whinston noted in 1990:

> While the analysis vindicates the leverage hypothesis on a positive level, its normative implications are less clear. Even in the simple models considered here, which ignore a number of other possible motivations for the [tying] practice, the impact of this exclusion on welfare is uncertain. This fact, combined with the difficulty of sorting out the leverage-based instances of tying from other cases, *makes the specification of a practical legal standard extremely difficult.*[165]

No matter what legal standard is chosen, the errors will go both ways: some ties that are harmful will be blessed and some ties that are beneficial will be condemned.

Determining the right legal standard depends on prior beliefs concerning the prevalence of harmful tying and the ability of the courts to separate harmful from beneficial tying.[166] Do we believe that tying is generally efficient? Do we believe that the courts can make decisions with a high degree of accuracy? A per se illegal rule is most appropriate if one believes that tying is frequently harmful and that the courts cannot accurately separate harmful from beneficial ties. In this case, it is better to condemn all ties than to risk approving many harmful ties only to save a few beneficial ties. A per se legal rule is most appropriate in the reverse case. Letting a few harmful ties through is a small price to pay for allowing businesses to engage in beneficial ties without the risk of erroneous condemnation. Between these two extremes one progresses from modified per se illegal (*Jefferson Parish*), to rule of reason (*Microsoft III*), to modified per se legal (Hylton-Salinger).[167]

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165 Whinston, *supra* note 134, at 855–56 (emphasis added).

166 For a formal approach to this issue, *see* Hylton & Salinger, *supra* note 142.

167 *Id.*

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Under the modified per se legal standard tying arrangements would be considered legal unless there is strong evidence that there are significant anticompetitive effects that outweigh procompetitive effects. The technological tying cases in the U.S. seem to adopt this approach.[168]

We believe that the weight of the evidence favors either a rule of reason approach (based on the three screens we discussed above) or a modified per se legal approach (one can view the modified per se legal approach as a version of rule of reason in which the burden of proof for establishing anticompetitive effects is high). By the same token, we believe there is no support in economics for treating tying practices under either a per se or modified per se illegality rule. Tying is widespread in the economy and has such beneficial effects on the cost and quality of products that consumers obtain. One must therefore assume that it is generally procompetitive. There is no reason to believe that practices that generate efficiencies when firms lack market power do not generate those same efficiencies when firms possess market power. We do not believe that economic theory or empirics are refined enough to distinguish procompetitive from anticompetitive tying in practice—a point that is echoed by several of the authors of theories of tying.[169] We have no reason to believe that courts or competition authorities possess more reliable methods for separating good ties from the bad. In a recent study, Barry Nalebuff

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168 *See, for example*, ILC Peripherals Leasing Corp. v. BM Corp., 448 F. Supp. 228 (N.D. Cal. 1978), *affirmed*, 636 F.2d 1188 (9th Cir. 1980), *cert. denied*, 452 U.S. 972, 101 S.Ct. 3126 (1981); and Foremost Pro Color v. Eastman Kodak Co., 703 F.2d 534 (9th Cir. 1983), *cert. denied*, 465 U.S. 1039, 104 S. Ct. 1315 (1984). For further detail, *see* HERBERT HOVENKAMP, FEDERAL ANTITRUST POLICY §§ 7.8 & 10.4 (1999).

169 *See* Whinston, *supra* note 134, at 855–56; and Carlton & Waldman, *supra* note 138. Likewise, Whinston (2001) states, "What is striking about the area of exclusive contracts and tying, however, is how little the current literature tells us about what these effects are likely to be. This state of (non) knowledge is, I think, responsible to a significant degree for the very strong but differing beliefs that economists often have about whether exclusive contracts and tying are likely to have welfare-reducing anticompetitive effects." Michael D. Whinston, *Exclusivity and Tying in U.S. v. Microsoft: What We Know, and Don't Know*, 15 J. ECON. PERSP. 63 (2001).

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and David Majerus have evaluated 13 legal cases in which bundling and tying were the issues.[170] They conclude that in most of those cases the authorities and courts make significant errors.[171]

Where we should be between the rule of reason and modified per se legality is a harder judgment. We leave that question for another day. It may be that certain classes of tying arrangements should fall into modified per se legality—that is the case with technological tying cases under U.S. law. It may be that other classes of tying cases—contractual ties by firms with significant market power—should fall under rule of reason. It is also quite possible that applying the structured rule of reason approach we have suggested will lead, de facto, to modified per se legality if, in practice, tying arrangements do not pass the first two screens.

VII. Conclusion

Having reviewed the development of legal and economic thinking on tying in both the United States and the European Union, we are now in the position to draw the following conclusions.

Contrary to conventional (and legal) wisdom,[172] we find that there is no intellectual gulf between the Chicago and post-Chicago economic schools. Most economists now would agree on three fundamentals. First, tying is a pervasive practice that, in many instances, gives rise to substantial efficiencies, particularly when it takes the form of product integration. Second, the circumstances in which tying would lead to anticompetitive effects are very restricted. And third, not only are those conditions hard to verify, but also any

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170 *See* part 2 of the study by Nalebuff, *supra* note 140.

171 "Broadly speaking, there are three potential reasons why we see tied sales: (1) preservation of quality; (2) price discrimination or metering; and (3) leveraging market power. The court decisions have focused on market leverage, while we find the first two explanations more compelling. *See* NALEBUFF, *supra* note 140, at 70.

172 "Post-Chicago economic analysis was borne out, and in essence is defined by, criticisms of the Chicago School." DORIS HILDEBRAND, THE ROLE OF ECONOMIC ANALYSIS IN THE EC COMPETITION RULES (2d ed. 2002).

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attempt to balance efficiency gains against possible anticompetitive effects will prove a complex exercise. Plaintiffs and competition authorities that look toward modern economic theories of tying to bolster the harsh per se prohibitions against tying would be well advised to look at the "product warnings"—quoted above—that economic scholars have placed on their theories. No serious economic writing supports a per se rule and most recognize the difficulty of discerning anticompetitive tying at all.

This consensus among economists has important policy implications. The recognition of efficiencies as well as possible anticompetitive effects suggests that per se rules are conceptually inappropriate for the analysis of tying. In other words, economic theory points to a rule of reason approach along the lines suggested in our three-stage analysis (see section VI.A). But, as is evident from our suggested methodology, such an analysis is resource-intensive and may prove inconclusive. The competition authorities, therefore, have the difficult choice between an approach that is conceptually sound but subject to considerable practical difficulties and an approach that is conceptually second-best but is easier to implement. This decision should consider whether the conceptual errors under the per se rule are more problematic than the implementation errors that would result from a rule of reason.

Of the three policy options opened to the authorities, per se prohibition is clearly the least attractive. It would kill a large number of efficiency-enhancing practices with no anticompetitive effects to catch just a small number of anticompetitive effects. The remaining choice between a rule of reason approach and per se legality is more difficult and, as we have suggested, may depend on the class of tying arrangements (technological vs. contractual) under consideration.

In antitrust, it generally takes time for developments in economic theory to lead to corresponding changes in competition policy. The time lag has proved to be particularly long for tying. The hostility of the antitrust approach toward tying on both sides of the Atlantic still reflects (to a greater or lesser extent) elements of pre-Chicago school thinking.

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Despite the persistent pre-Chicago school elements in both the U.S. and the EU, there is a fundamental difference between the two policy systems: while EC competition policy has largely been static in its assessment of tying over the last 40 years, U.S. antitrust has slowly followed economic thinking from an extreme per se prohibition to a modified per se rule to a rule of reason, albeit in limited circumstances. Clearly, *Microsoft III* is not yet the end of the line. It should be the beginning of the line in the European Union.

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III

David S Evans, A Jorge Padilla and Michael A Salinger†

A Pragmatic Approach to Identifying and Analysing Legitimate Tying Cases

Abstract

There is a wide and growing consensus among antitrust scholars and practitioners in favour of a rule-of-reason approach to the assessment of tying by dominant firms. However, a rule-of-reason analysis may or may not produce socially optimal outcomes depending on how it is conducted in practice. A rule-of-reason test that places the same weight on factual evidence as on theoretical speculation is bound to cause as much harm as a rule that considers tying *per se* illegal: many socially beneficial ties will be found illegal. This paper discusses how best to implement a rule-of-reason approach. We consider two alternatives, a simple balancing test and a structured test, and conclude in favour of the structured test, as it is less likely to lead to costly mistakes.

A. Introduction

Judging from the recent case law on both sides of the Atlantic, one might be tempted to infer that tying must often be socially detrimental. Otherwise, what would justify the hyperactivity exhibited by the EU and US competition authorities in connection with this rather common business practice? And how can the *per se* illegality approach, which by and large characterises current EC and US competition law with respect to tying, be justified?

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In Europe, for example, the Commission's decisions blocking the *GE/Honeywell*[1] and *Tetra Laval/Sidel*[2] mergers were based in part on concerns about the possibility that the merging parties would use their widened product lines to offer attractive 'bundles' that would place their competitors at a disadvantage. In the US, some of the most prominent antitrust cases of recent years have focussed on the legitimacy of tying when undertaken by firms with market power. Tying was one of the central concerns of the US Department of Justice in its suit against Microsoft,[3] and was also at the heart of the suit brought by Wal-Mart and other US retailers against VISA and MasterCard.[4] In addition, the legality of 'bundled rebates' has been considered by the US 3rd Circuit Court of Appeals in *LePage's v. 3M*.[5]

Is this hostile policy towards tying justified? Is *per se* illegality, as applied in the US and the EU, the right legal standard when considering tying by firms with market power? The most recent literature on the law and economics of tying suggests that the answers to both questions are in the negative. The hyperactivity of the competition authorities on both sides of the Atlantic regarding tying is far from justified. The most robust statement one can make about tying is that it is ubiquitous and generally beneficial.[6] In light of this uncertainty regarding the effects of tying on competition, at least in the abstract, the *per se* illegality standard that competition authorities employ is difficult to defend.[7]

Modern economic reasoning supports a rule-of-reason approach to tying.[8] The economics literature is clear that tying often improves economic efficiency,[9] that it may be used for anticompetitive purposes,[10] and that the

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[1] Case COMP/M. 2220, *General Electric/Honeywell*, Commission decision of 3 July 2001, OJ C 331 [2001].

[2] Case COMP/M. 3345, *Tetra Laval/Sidel*, Commission decision of 30 October 2001, OJ L 43 [2002].

[3] *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001).

[4] *Wal-Mart Inc., et al v. Visa USA and MasterCard International*, U.S. District Court of New York, CV-96-5238, <http://www.visamediacenter.com/background/complaint.asp>, downloaded August 4, 2003.

[5] *LePage's Inc. v. 3M*, Slip Decision in Nos. 00-1368 and 00-1473 (3rd Cir. 2003).

[6] See D S Evans & M Salinger, *Quantifying the Benefits of Bundling and Tying*, Working Paper (2003). See also P Seabright, *Tying and Bundling: From Economics to Competition Policy*, Edited Transcript of a CNE Market Insights Event, Sept. 19, 2002, <http://www.centreforthe-neweurope.org/pub_pdf/ 09192002_tying_bundling.htm>.

[7] See, *e.g.*, K N Hylton and M Salinger 'Tying law and policy: a decision-theoretic approach' (2001) 69 *Antitrust Law Journal* 469, at 470–1.

[8] See D S Evans, A Jorge Padilla and M Polo 'Tying in platform software: reasons for a rule of reason standard in European competition law' (2002) 25 *World Competition* 509; C Ahlborn, D S Evans and A Jorge Padilla 'The antitrust economics of tying: a farewell to per se illegality' (2003) *Antitrust Bulletin*, Section V.B. and references therein.

[9] See, *e.g.*, A Director and E H Levi 'Law and the future of trade regulation' (1956) 51 *Northwestern University Law Review* 281; G J Stigler *The Organization of Industry* (1968); R A Posner *Antitrust Law: An Economic Perspective* (1976); R H Bork *The Antitrust Paradox* (1978) 378–9. See also *supra* note 6.

[10] See, *e.g.*, M D Whinston 'Tying, foreclosure and exclusion' (1990) 80 *American Economic Review* 837; D W Carlton and M Waldman 'The strategic use of tying to preserve and create market power in evolving industries' (2002) 33 *RAND Journal of Economics* 194.

motive for it is sometimes price discrimination with generally ambiguous implications for economic welfare.[11] Theory by itself only says that tying practices might have both anticompetitive and pro-competitive effects and, consequently, that they might be inefficient sometimes and efficient at other times. The consensus among economists is that one must conduct a detailed investigation of the facts of the case at hand to conclude whether tying is indeed harmful or beneficial.[12] Such investigation is best conducted under a rule-of-reason standard where both the potential pro– and anticompetitive effects of tying are rigorously balanced in light of the appropriate factual evidence.

The rule-of-reason approach to tying has found new support in a recent report prepared for the UK Department of Trade and Industry by Professor Nalebuff and co-author David Majerus.[13] This report will do much to refine thinking about tying and bundling. Nalebuff and Majerus evaluate eleven antitrust and merger cases from various jurisdictions where the legality of bundling and tying practices was thoroughly examined.[14] They find that in three of those cases the competition authorities incorrectly concluded that tying was illegal when, in fact, it was not harmful to consumers.[15] In none of

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[11] See D W Carlton and J M Perloff *Modern Industrial Organization*, 3rd ed. (Addison-Wesley, 2000)

[12] See Carlton and Waldman, above n ; and Hylton and Salinger, above n .

[13] B Nalebuff and D Majerus, *Bundling, Tying and Portfolio Effects*, DTI Economics Paper No. 1, Part 2—Case Studies (February 2003).

[14] While Nalebuff and Majerus actually examine thirteen separate cases, two are about different aspects of the *GE/Honeywell* merger, and one had not been decided when the report was published so we exclude it, leaving eleven cases. These eleven are: "Tetra Pak International" (*Tetra Pak II,* Commission Decision 92/163/EEC, 1992 OJ L 72/1; Case T-83/91 *Tetra Pak II* [1994] ECR II-755); "Tying and the HILTI case study" (*Eurofix-Bauco v. Hilti,* Commission Decision 88/138/EEC, 1988 OJ L 65/19; Case T-30/89 *Hilti AG v. Commission* [1990] ECR II-163; Case C-53/92 P *Hilti AG v. Commission* [1994] ECR I-667); "GE-Honeywell merger" (Case COMP/M. 2220, *General Electric/Honeywell*, Commission decision of 3 July 2001); "Independent Service Organisations *v.* Kodak" (*Independent Service Organizations v. Kodak,* 504 U.S. 451 (1992)); the "Aspen Case" (*Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585 (1985)); "Guinness and Grand Metropolitan merger" (Case IV/M.938, *Guinness/Grand Metropolitan* (98/602/EC)); "Interbrew and Bass merger" (United Kingdom Competition Commission on the Interbrew SA and Bass PLC transaction, "A report on the acquisition by Interbrew SA of the brewing interests of Bass PLC", January 2001); "SMG SRH—Scottish Radio case" ("Completed acquisition by SMG plc of 29.5% shareholding of Scottish Radio Holdings plc," Report under section 125(4) of the Fair Trading Act 1973 of the Director General's advice to the Secretary of State for Trade and Industry under section 76 of the Act, 21 June 2001); "Foreign package holidays and insurance" *(Foreign Package Holidays: a report on the supply in the UK of tour operators' services and travel agents' services in relation to foreign package holidays,* United Kingdom Monopolies and Mergers Commission, Cm 3813, 19 December 1998); "BT telephone and internet bundling" *(Investigation by the Director General of Telecommunications into the BT Surf Together and BT Talk and Surf Together pricing packages,* Oftel, 4 May 2001); "Jefferson Parish Hospital" (*Jefferson Parish Hospital Dist. No. 2 et al. v. Hyde,* 466 U.S. 2 (1984)).

[15] *Eurofix-Bauco v. Hilti,* Commission Decision 88/138/EEC, OJ L 65 [1988]; Case COMP/M 2220, *General Electric/Honeywell*, Commission decision of 3 July 2001, OJ C 331 [2001]; United Kingdom Competition Commission on the Interbrew SA and Bass PLC transaction: "A report on the acquisition by Interbrew SA of the brewing interests of Bass PLC", January 2001.

those cases, however, did the authorities conclude incorrectly that tying was socially beneficial when it was not. That is, while there is evidence of 'false convictions,' there is no evidence of 'false acquittals.' Moreover, in seven of the eleven cases—that is, in 64% of the sample—tying was not harmful to consumers.[16]

From this report, one can draw the following policy implications: (a) the observed hostility towards tying is unjustified, since even tying that has been challenged is often welfare-enhancing; (b) a *per se* illegality approach to tying, whether in its strict or modified versions, makes no economic sense, as it often leads to the prohibition of beneficial tying practices; (c) the analysis of the competitive impact of tying and bundling requires a balancing of efficiencies and possible anticompetitive effects—that is, it demands a rule-of-reason approach.

In this paper, our goal is to move the debate on tying forward by considering how best to implement a rule-of-reason standard in practice. We show that the success of a rule-of-reason approach depends on how it is conducted in practice and depends, most importantly, on the weight attributed to the facts of the case under analysis.

We discuss two alternative ways of implementing a rule-of-reason standard in tying cases: a *balancing test* and a *structured test*. The former is a simple cost-benefit test, where the social costs and benefits of the defendant's tying practices are balanced in one step. The structured rule-of-reason test involves three stages.[17] The first two stages screen out ties that could not be anticompetitive given the facts of the case. The last stage balances the anticompetitive and pro-competitive effects of those ties that survive the first two screens.

We compare the relative strengths and weaknesses of these two tests, and conclude in favour of the structured rule-of-reason approach. This conclusion is based on a simple decision—theoretic calculation: a structured rule-of-reason approach to tying reduces the likelihood and the burden of costly mistakes. The structured rule-of-reason test dismisses cases when the market structure insures that whatever anticompetitive effects could arise are smaller than the imprecision of the models we might use to detect them. It also takes the possibility of efficiencies seriously.

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[16] *Eurofix-Bauco v. Hilti,* Commission Decision, *supra* note no. 15; *General Electric/ Honeywell, supra* note no. 15; United Kingdom Competition Commission on the Interbrew SA and Bass PLC transaction, "A report on the acquisition by Interbrew SA of the brewing interests of Bass PLC", January 2001; "Completed acquisition by SMG plc of 29.5% shareholding of Scottish Radio Holdings plc," Report under section 125(4) of the Fair Trading Act 1973 of the Director General's advice to the Secretary of State for Trade and Industry under section 76 of the Act, 21 June 2001; "Foreign Package Holidays: a report on the supply in the UK of tour operators' services and travel agents' services in relation to foreign package holidays," United Kingdom Monopolies and Mergers Commission, Cm 3813, 19 December 1998; "Investigation by the Director General of Telecommunications into the BT Surf Together and BT Talk and Surf Together pricing packages", Oftel, 4 May 2001; *Jefferson Parish Hospital Dist. No. 2 et al. v. Hyde,* 466 U.S. 2 (1984).

[17] This test was first proposed in Ahlborn, Evans and Padilla, above n .

This paper is organised as follows. In Section II, we briefly review the economics of tying and explain the reasons why economic theory supports a rule-of-reason approach to tying. In Section III, we summarise the evidence in the Nalebuff–Majerus study and explore some policy implications. In Section IV, we consider alternative implementations of a rule-of-reason approach to tying and articulate the reasons why a structured rule-of-reason approach is most desirable. Section V presents the main conclusion of this paper, while Section VI opens a new direction for further thought.

B. The Simple Economics of Tying

The economic literature has explained why tying can provide increased convenience and lower transaction costs. The same literature has also clarified the situations in which tying may give rise to anticompetitive effects. Unfortunately, the literature does not provide much guidance on exactly how to distinguish competitive from anticompetitive tying. Consequently, while sound economic analysis will always be key to identifying valid tying cases, it is important to recognise that economic theory does not yet provide unambiguous answers about the appropriate treatment of individual cases.

1. Efficiencies and Convenience

Tying can lower costs and promote convenience (for both producers and consumers). Tying may (a) create economies of scale and scope in production and distribution[18]; (b) reduce the costs of searching for the most appropriate combination of products that satisfy a complex need[19]; (c) give rise to new or improved products and services[20]; (d) help manufacturers ensure quality[21]; and (e) lead to lower prices when the tying and tied products are complements.[22]

This rationale—ie, lower costs and enhanced convenience—is virtually always mentioned as a candidate explanation for tying, and it is often

[18] See, *e.g.*, S J Davis, K M Murphy and J MacCrisken 'Economic perspectives on software design: PC operating systems and platforms' in D S Evans, (ed) *Microsoft, Antitrust and the New Economy* (2002).

[19] See Evans, Padilla and Polo, above n .

[20] See, *e.g.*, Amil Petrin 'Quantifying the Benefits of New Products: The Case of the Minivan' (2002) 110 *Journal of Political Economy* 705, at 728.

[21] See Posner R., above n 9.

[22] See A Cournot *Recherches sur les Principes Mathématiques de la Théorie des Richesses* (1838), and Jean Tirole *The Theory of Industrial Organization* (1988) at 333–5.

conceded that it is the most common explanation. However, there is some tendency for the importance of cost and convenience advantages to be neglected or obscured. For example, one might argue that while there are no doubt advantages to tying for consumers who want all components of the tie, there is no reason why those components could not be sold separately as well for those consumers who do not want all of those components. Such an argument misses a fundamental point about the basic economics of tying, namely, the savings that result from the joint manufacturing and joint distribution of products and services.

In the absence of economies of scale and scope, competition would result in firms offering products that meet each customer's ideal specifications. When scale and scope economies are present, however, the production and distribution of a number of distinct product offerings becomes disproportionately costly. In those circumstances, tying can arise under competition even though some customers feel forced to accept components they do not want.

A simple example is that most restaurants tie bread with meals. The restaurant market in many areas is highly competitive. Not everyone wants bread with meals and certainly people vary with respect to how much bread they want. Yet charging separately for bread would likely increase transaction costs by more than the potential savings. Because of fixed costs associated with each product offering, companies operating in a competitive environment cannot afford to tailor their offerings to the tastes of each individual customer.

One difficulty in assessing the benefits from tying is that these benefits often entail savings in transaction and organisation costs, which are harder to measure and easier to dismiss than production costs. Their significance in extreme cases is, of course, obvious. We know of no one who seriously suggests that newspapers in the United States should be unbundled (by section) or that European newspapers should have physically separate sections to facilitate such unbundling. Newsstands would have to maintain piles of individual sections rather than a single pile of complete papers. The virtually instantaneous transaction that now occurs for, say, €1 would require the seller to calculate a transaction price and make change for it. For daily subscribers, the paper would have to maintain a database not only of who subscribes but also of what parts of the paper they subscribe to. Rather than having a pile of newspapers to distribute, the deliverer would have to make sure to deliver the customised edition to each house. To support the sale of advertising, the newspaper would have to maintain audited accounts of the sales of each section rather than of the newspaper as a whole. Given how little is charged for a daily newspaper, even very modest increases in the time needed to process the transactions would obviously dwarf the benefits from unbundling.

What is true for newspapers is also true in general. Every company must decide precisely what product to offer and on what terms. These choices are typically a small subset of the products that could conceivably be offered.

2. Exercising, Preserving, and Extending Market Power

Tying practices have also been characterised as either pricing strategies to extract more rents from consumers, or as means of extending or preserving monopoly power.[23]

Tying for *price discrimination* purposes has generally ambiguous welfare effects. The goal of price discrimination is to capture what would otherwise be consumer surplus. Demand curves can be thought of as statistical distributions of the willingness to pay. If every customer placed the same value on each unit of the good, there would be no variation in the willingness to pay and a seller could capture the entire surplus with a simple price per unit. A downward slope to the demand curve, which is of course the typical case, is the result of variation in the willingness to pay. Such variation creates a trade-off between the surplus extracted per customer and the number of customers. Tying typically lowers the variation of the willingness to pay[24] and, under some conditions, makes it possible to capture more surplus. Economic theory shows that price discrimination can, in principle, be pro-competitive or anti-competitive depending on its impact on aggregate output. Price discrimination is welfare-enhancing when it facilitates access to the market for consumers with lower willingness to pay.[25]

Tying can also be used to *leverage market power* in respect of one good to another. Suppose a company has a monopoly over widgets and sells gadgets in a competitive market. By bundling widgets and gadgets, customers who want the widgets get the gadgets 'for free.' Competing gadget producers are then precluded from competing on the merits for business. Persuasive as this argument sounds at first, it is generally considered to be incomplete, as it lacks an explanation of why the widget monopolist would like to use its market power in this way rather than simply raising the price of widgets.[26]

There has been much recent work that has argued that it is theoretically possible to answer this question. Economic theorists have shown that a firm with monopoly power in respect of the tying good might have an anticompetitive incentive to tie when the tied good market is imperfectly competitive,

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[23] See, *e.g.*, M D Whinston 'Exclusivity and tying in *U.S. v.* Microsoft: what we know, and don't know' (2001) *Journal of Economic Perspectives*.

[24] For example, a consumer may value a unit of product A at €10 and a unit of product B at €5, while another consumer may value A at €5 and B at €10. Product by product their preferences are highly heterogeneous, yet both consumers are willing to pay the same, *i.e.*, €15, for the bundle.

[25] See Carlton and Perloff, above n 11.

[26] The so-called "single monopoly profit theorem" states that a firm enjoying monopoly power in one market (the market for the tying good) would not increase its profits, and indeed could reduce them, by monopolising the market for another good (the market for the tied good). This idea applies to cases where the levels of demand for the two goods are both independent and complementary, provided that the market for the tied good is competitive.

provided that tying either deters potential competitors from entering the market for the tied product or, alternatively, helps the monopolist to preserve its market power in the tying product.[27] Through tying, the monopolist deprives its competitors in the tied good market of adequate scale, thereby lowering their profits below the level that would justify remaining active in (or entering, as the case may be) that market.

These theories rely on a series of highly abstract, game–theoretic models, which, depending on the underlying assumptions, often lead to contradictory predictions.[28] Therefore, a major challenge for antitrust enforcement is to figure out how to flesh out the details of these models in real cases. As Whinston noted in his seminal paper on tying, 'While the analysis vindicates the leverage hypothesis on a positive level, its normative implications are less clear. Even in the simple models considered here, which ignore a number of other possible motivations for the [tying] practice, the impact of this exclusion on welfare is uncertain.'[29]

3. Economic Theory Supports a Rule-of-Reason Standard

The recent literature on the economics of tying has drawn three main conclusions. First, tying is a common business practice that is most often efficient. Second, tying may cause anticompetitive effects, but only under restricted circumstances that are hard to verify in practice. Third, given that tying may give rise to both pro-competitive and anticompetitive effects, no *per se* rule is conceptually appropriate for antitrust assessment of tying practices.[30] Economic theory supports a rule-of-reason approach to tying in which the potential anticompetitive effects and efficiency benefits of tying are carefully balanced given the facts of the case. As we will see in the next Section, a rigorous reading of some of the most relevant tying cases of recent years points in the same direction.

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[27] See, *e.g.*, Whinston above n 12; Carlton and Waldman above n 12; Barry Nalebuff *Bundling*, Yale ICF Working Paper #99-14 (1999).

[28] Compare, for example, the conclusions of Whinston, above n 10, with those of J Carbajo, D De Meza and D Seidman 'A strategic motivation for commodity bundling' (1990) 38 *Journal of Industrial Economics* 283.

[29] Whinston, above n 10, at 855–6.

[30] See Hylton and Salinger, above n 7, at 470: "[T]he *per se* rule against tying simply has no economic foundation."

C. A Decision-Theoretic Perspective on Nalebuff–Majerus

As noted above, in the second volume of a report prepared for the UK Department of Trade and Industry,[31] Professor Barry Nalebuff and David Majerus evaluated eleven cases in which various tying practices were thoroughly analysed.[32] Their conclusions provide valuable insights in assessing the current state of 'tying' law.[33] In this section, we consider the implications of these eleven case studies for the choice of an appropriate legal standard with respect to tying.

The standard decision–theoretic treatment of legal standards is to divide cases along two dimensions. One concerns the outcome of the case: *legal* or *illegal*. The other concerns the correct outcome, which we will label *harmful* or *not harmful*.

Some of the cases analysed by Nalebuff and Majerus are easy to classify along these two dimensions. The *SMG SRH–Scottish Radio* case,[34] British Telecom's bundling of voice telephony with un-metered off-peak internet access,[35] and *Jefferson Parish*[36] are cases in which Nalebuff and Majerus agree with the finding by the authorities of no anticompetitive harm. *Tetra Pak II*[37] and *Kodak*[38] are two cases in which they agree with the finding that there was anticompetitive harm. By contrast, Hilti's tying of nails to nail cartridges,[39] the various tying concerns in the *GE/Honeywell* merger,[40] and the merger of Interbrew and Bass[41] are cases in which Nalebuff and Majerus conclude that there was no basis to justify findings of competitive harm.

The remaining cases are not so easily classified. Nalebuff and Majerus conclude that it was appropriate to ban the tying of trip insurance to vacation packages in order to make pricing transparent,[42] but they do not see this

[31] See above n 13.

[32] See above n 14.

[33] We do not necessarily agree with all of their conclusions or classifications of the cases.

[34] "Completed acquisition by SMG plc of 29.5% shareholding of Scottish Radio Holdings plc," Report under section 125(4) of the Fair Trading Act 1973 of the Director General's advice to the Secretary of State for Trade and Industry under section 76 of the Act, 21 June 2002.

[35] "Investigation by the Director General of Telecommunications into the BT Surf Together and BT Talk and Surf Together pricing packages", Oftel, 4 May 2001.

[36] *Jefferson Parish Hospital Dist. No. 2 v. Hyde,* 466 U.S. 2, 16 (1984).

[37] Case T-83/91 *Tetra Pak II* [1994] ECR II-755.

[38] *Independent Service Organizations v. Kodak,* 504 U.S. 451 (1992).

[39] *Eurofix-Bauco v. Hilti,* Commission Decision 88/138/EEC, 1988 OJ L 65/19; Case T-30/89 *Hilti AG v. Commission* [1990] ECR II-163; Case C-53/92P *Hilti AG v. Commission* [1994] ECR I-667.

[40] *General Electric/Honeywell,* above n .

[41] United Kingdom Competition Commission on the Interbrew SA and Bass PLC transaction, "A report on the acquisition by Interbrew SA of the brewing interests of Bass PLC", January 2001.

[42] "Foreign Package Holidays: a report on the supply in the UK of tour operators' services and travel agents' services in relation to foreign package holidays," United Kingdom Monopolies and Mergers Commission, Cm 3813, 19 December 1998.

example of tying as being inherently anticompetitive. Similarly, while the UK Mergers and Monopoly Commission (MMC) banned travel companies and travel agents from forcing their customers to purchase a particular kind of insurance, it permitted them to offer 'free' insurance.[43] Thus, it did not ban tying *per se*. It simply regulated how the practice would be communicated to customers. We therefore classify this case as one in which Nalebuff and Majerus agree with the MMC that there was no harm to competition.

In *Aspen Skiing Co,*[44] Nalebuff and Majerus find harm to competition, as did the United States Supreme Court, but they take issue with the Court's reasoning. We place this case in the illegal/harmful category. The merger of Guinness and Grand Metropolitan raises a similar issue.[45] Nalebuff and Majerus agree that there was at least the potential for anticompetitive harm, but they criticise the European Commission's decision to force divestiture of some brands as being too heavy-handed. We also classify this case in the illegal/harmful category.

In a tabular form, therefore, the above eleven cases can be classified from a decision–theoretic perspective as follows:

Table 1. A Decision–Theoretic Perspective on Nalebuff and Majerus (2003)

	Illegal	**Legal**
Harmful to competition	**Four**	**None**
Not harmful to competition	**Three**	**Four**

If, for the sake of discussion, one could take Table 1 as reflecting the actual frequency at which tying is harmful or not harmful to competition, we would draw the following conclusions:

> First, there are no 'false acquittals,' i.e., there are no cases that were found legal while being harmful to consumers (the light shaded area in Table 1). By contrast, 'false convictions' do occur, i.e., cases where the practices are found illegal even though they cause no anticompetitive harm (the dark shaded area in Table 1). Assuming that each type of error is equally costly, the result would suggest that past policy has been overly restrictive.
>
> Second, a *per se* illegality approach to tying would often lead to the prohibition of beneficial tying practices: it would have led to error in 7 out of the 11 cases considered. Likewise, a *per se* legality approach would lead to errors by allowing anticompetitive tying in 4 out of 11 cases. It follows that the analysis of the competitive impact of tying must be conducted under a rule-of-reason standard that balances efficiencies and anticompetitive effects.

[43] *Ibid.*
[44] *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585 (1985).
[45] Case IV/M.938, *Guinness/Grand Metropolitan* (98/602/EC).

Third, the fraction of cases that are not harmful to competition exceeds the fraction of cases that are. Thus, a legal standard that recognises the possibility of judicial error would not treat anticompetitive and pro-competitive explanations as being equally plausible. The standard would have to embody some presumption that bundling or tying is often pro-competitive.

Of course, in reality Table 1 does not reflect the objective frequency of the harmful or not harmful effects of tying. First, the sample of eleven cases is small. Furthermore, the cases come from multiple jurisdictions and, more importantly, are self-selected, well-trodden cases. A table of this sort is only meaningful with respect to a single set of laws and enforcement institutions. There are a number of reasons, however, why we believe that this Table in fact overstates the true fraction of anticompetitive cases. First, in cases in which the appropriate classification was not clear, we opted for the illegal/harmful category. Second, some of these cases include what should properly be understood as vertical integration cases. Such cases are themselves controversial, but the possibility that anticompetitive harm might result from vertical mergers is much less controversial than is the case with tying. It is not valid to use rates of anticompetitive harm from vertical mergers to justify antitrust hostility to mergers that have neither vertical nor horizontal aspects to them. Finally, the Nalebuff–Majerus conclusions about which cases were indeed anticompetitive are themselves debatable.

D. Rule-of-Reason: Alternative Implementation Tests

Both Section B (theory) and Section C (evidence) conclude in favour of a rule-of-reason approach to the analysis of tying by firms with market power. Rule-of-reason assessments are typically conducted through the so-called method of the 'competitive balance,'[46] according to which the potential pro-competitive and anticompetitive effects of tying are balanced in light of the available evidence. Yet in the case of tying, a simple balancing test raises some considerable difficulties.

First, comparing the efficiency effects and the anticompetitive effects of tying is necessarily an extremely complex exercise. On the one hand, as we discussed in Section B point 1, measuring the benefits of tying in terms of transaction costs and convenience may prove difficult. In addition, as we saw in Section B point 2, the game–theoretic models developed in recent years to show the possibility of anticompetitive tying do not provide a universally applicable checklist that competition authorities can safely use in their

[46] See P Manzoni 'The European rule of reason—crossing the sea of doubt' (2002) 23 *European Competition Law Review* 8, 392–9.

rule-of-reason analyses. While it is possible to construct more or less formal 'stories' in which tying can prove anticompetitive, the difficulty is that the facts never match up exactly with the assumptions of the economic models, and multiple explanations are plausible. As Carlton and Waldman note,

> [T]rying to turn the theoretical possibility for harm . . . into a prescriptive theory of antitrust enforcement is a difficult task. For example, the courts would have to weigh any potential efficiencies from the tie with possible losses due to foreclosure, which by itself is challenging due to the difficulty of measuring *both* the relevant efficiencies and the relevant losses.[47]

Most importantly, a simple balancing test applied to individual cases would treat each candidate explanation as equally likely. The evidence in Section C implies that there should be no presumption that tying is anticompetitive, even when undertaken by firms in a dominant position. If anything, the presumption should be that tying often has beneficial effects.

1. A Structured Rule-of-Reason Approach

To avoid those problems, at least in part, we propose a structured rule-of-reason test.[48] Under this approach, any claim of anticompetitive tying would have to pass through three stages. The first two stages screen out ties that could not be anticompetitive given the facts of the case. The last stage balances anticompetitive and pro-competitive effects for those ties that survive the first two screens. In the first two stages, the burden of proof is placed on the prosecution; in the last stage, the burden of proof is shared by both sides: the defendant must prove the existence and magnitude of the alleged efficiencies, while the prosecution must establish that the anticompetitive effects of tying more than offset its efficiency effects.

The first screen is a market power test to assess whether the tying occurs in a market in which a substantial exercise of market power is possible. Economic theory shows that tying cannot possibly have anticompetitive effects unless a firm enjoys monopoly power in the tying market and faces imperfect competition—resulting from a small number of firms and barriers to entry—in the tied market. In the absence of market power, an anticompetitive tie is not possible.

The second screen is an assessment of the plausibility of the claim that the tying practice is indeed anticompetitive. At this stage, the plaintiff would have to present a relatively complete, though not necessarily formal, model of the claim that the practice is anticompetitive. This screen will eliminate those cases based on models—or stories—that do not withstand factual scrutiny. A

[47] See Carlton and Waldman, above n 10, at 215 (emphasis added).
[48] See Ahlborn, Evans and Padilla, above n 8.

valid case would require, *inter alia*, answering the following question: why does it make sense for the tying firm to force goods upon consumers that they do not want? This screen is empirically demanding, but one must confront theory with fact.

Assuming that the case survived the first two screens, the defendant would then be allowed to argue either that the practice is motivated entirely by efficiencies. These efficiencies should only be achievable by means of the tie. If the tie is shown to have beneficial effects, the prosecution should then demonstrate that the efficiencies are insufficient to offset any anticompetitive effects.

2. The Choice of the Test

In deciding what the correct test for the competitive assessment of tying is, as when choosing one legal standard over another, one must evaluate the likelihood and the cost of erroneous decisions. A structured rule-of-reason approach to tying reduces the likelihood of costly mistakes. This is because the structured rule-of-reason test:

a) Verifies whether it is possible that the tying practice in question could have anticompetitive effects given the status of competition in the tying and tied markets.
b) Scrutinises the factual plausibility of the particular anticompetitive theory advanced in the particular case;
c) Limits the complex balancing of pro-competitive and anticompetitive effects to those ties that are proven to have anticompetitive effects; and, most importantly,
d) Recognises that tying is a ubiquitous phenomenon that often produces considerable efficiencies. In formulating a test that trades off false acquittals and false convictions, the relative frequency of competitive and anticompetitive ties is an important consideration. Given the wide consensus that the vast majority of ties either lower costs or promote convenience, a rational policy toward tying must entail high hurdles for establishing an illegal tie so as to reduce the rate of false convictions. This is precisely what our proposed test aims to achieve and what a simple balancing test fails to do.

E. Our Main Conclusion

The principal conclusion of our analysis is that, from the viewpoint of social welfare, it is not enough to accept that a rule-of-reason standard constitutes

the right approach for the analysis of tying cases. The outcome of a rule-of-reason analysis hinges crucially on how it is conducted in practice and, most importantly, on the weight attributed to the facts of the case at hand.

A rule-of-reason approach to tying that does not discriminate between factual evidence and theoretical speculation is not a reasonable test and, what is more, would cause the same kind of harm as a *per se* illegality rule: many socially beneficial ties would be prohibited.

F. An Epilogue for Skeptics and Pragmatics

One might argue that the structured rule-of-reason test, while better than a simple balancing test, is still too difficult to implement in practice. Indeed, the second and third screens in the test involve highly demanding empirical investigation, which we are not well prepared to undertake given the current state of our econometric tools and the usually insurmountable difficulties faced by researchers when collecting data.

Although we believe that the structured rule-of-reason test provides a useful analytical tool in the analysis of tying cases,[49] its application to individual cases is resource-intensive and may yield no definitive results. The structured rule-of-reason test will prove most useful in extreme situations, i.e., where it is clear after the first two screens that the anticompetitive allegations are highly implausible and where there is clear-cut evidence supporting efficiency benefits. The test will also be useful in situations where the tie survives the two first screens but no efficiencies can be rigorously argued. In other situations, the test may prove inconclusive.

Faced with the difficulties described above regarding the structured rule-of-reason test, competition authorities and courts may decide in favour of a simpler *per se* standard. As Hylton notes,[50] an important factor in choosing between a rule-of-reason approach and a *per se* rule is the administrative and enforcement costs of implementing the legal standard. But if that is the case, given that there is no support for treating tying practices under either a *per se* illegality or modified *per se* illegality rule, the only realistic option opened to antitrust regulators is a (modified) *per se* legality standard, where tying is presumed legal unless there is clear factual evidence of anticompetitive effects and no efficiencies can be found.

A *per se* legality rule will result in more false acquittals. The cost of false acquittals must be compared to the cost of the additional administrative costs

[49] See D S Evans, A J Padilla and M A Salinger, *Applying a Structured Rule of Reason Test to Article 82 Tying cases* (manuscript).

[50] K N Hylton, *Antitrust Law, Economic Theory and Common Law Evolution* (New York, CUP, 2003)

(V) Ehlermann Evans 1/2/06 11:59 Page 571

of having a rule-of-reason test as well as the costs of false convictions resulting from the application of that test. Given that tying is most often beneficial, it is possible that making tying *per se* legal is less costly than making it subject to a rule-of-reason test.

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David S. Evans & Michael Salinger

Why Do Firms Bundle and Tie? Evidence from Competitive Markets and Implications for Tying Law

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Why Do Firms Bundle and Tie? Evidence from Competitive Markets and Implications for Tying Law

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Tying the sale of products that could be sold separately is common in competitive markets—from left and right shoes, to the sports and living sections of daily newspapers, to cars and radios. This paper presents a cost-based theory of tying in competitive markets and applies this theory to bundling and tying in pain relievers and cold medicines, foreign electrical plug adapters, and mid-sized automobile sedans. We show that product-specific scale economies are needed to understand tying, yet these scale economies might be hard to detect. We draw two principal conclusions for tying law. First, the theoretical and empirical evidence of tying efficiencies supports abandoning per se treatment of tying. Second, the difficulties in documenting efficiencies, even when they are clearly present, suggests that the rule-of-reason approach to tying should not impose too high a burden on the defendant to prove efficiencies.

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Introduction

Tying occurs when a firm sells a particular item (the tying good) only together with some other item (the tied good).[1] In the United States, tying by a firm with market power in the tying good can be a per se violation of the antitrust laws.[2] The law presumes that tying allows a firm to leverage market power from one good to another.[3] But tying is a common practice in markets in which the tying good is competitive (so leverage is not possible) and in which the tied good is competitive (so leverage is not profitable).[4] Thus leveraging cannot be the only economic explanation for tying, nor can we assume that a firm with market power ties in order to leverage rather than for

1 HERBERT HOVENKAMP, FEDERAL ANTITRUST POLICY § 10.4 (1999); RICHARD WHISH, COMPETITION LAW 605-11 (4th ed. 2001).

2 Jefferson Parish Hosp. v. Hyde, 466 U.S. 2 (1984). For a recent discussion and application of that standard, see *In re* Visa Check/MasterMoney Antitrust Litig., No. 96-CV-5238, 2003 U.S. Dist. LEXIS 4965, at *6 (E.D.N.Y. Apr. 1, 2003). For a review of the case law in Europe, see Christian Ahlborn et al., *The Antitrust Economics of Tying: A Farewell to Per Se Illegality*, 49 ANTITRUST BULL. 287 (2004).

3 Standard Oil v. United States, 337 U.S. 293, 305-06 (1949).

4 *See* CTR. FOR THE NEW EUROPE, Tying and Bundling: From Economics to Competition Policy, Edited Transcript of a CNE Market Insights Event, Sept. 19, 2002, http://www.cne.org/pub_pdf/2002_09_19_tying_bundling.htm (last visited Nov. 11, 2004).

competitive reasons. Tying in competitive markets presumptively occurs because it is efficient—it reduces costs or improves quality. Yet the economics literature focuses exclusively on tying by firms with monopoly power.[5] Moreover, this literature ignores efficiency explanations—often explicitly.[6] Therefore, the current scholarship cannot explain the existence of tying in competitive markets and it cannot provide a complete theory even of tying by firms with significant market power until it considers efficiencies that might arise from tying.[7]

This article takes a necessary but heretofore neglected step toward a positive economic theory of tying. It examines the sources of efficiencies that explain tying in competitive markets. Three case studies provide empirical content for our analysis: cold remedies, foreign electrical adapters, and automobile options. Part I reviews the law on tying in both Europe and the United States and the existing economics literature. Part II presents a new economic model of competitive bundling and tying that we propose as an alternative to those discussed in Part I. Parts III to V present the results of our drug, adapter, and automobile case studies, respectively. Part VI summarizes our findings and discusses their implications for antitrust doctrine. Part VII concludes. The remainder of this introduction summarizes our main findings and describes the organization of this Article.

Towards a Positive Theory of Tying

The Chicago School explanation for tying is the temporal and intellectual benchmark. The pre-Chicago case law claimed that tying was an attempt to leverage a monopoly in one market to another.[8] The Chicago School claimed to debunk the leverage hypothesis with the "single-monopoly-profit theorem." With one monopoly profit to be had, the monopolist has neither the incentive

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5 *See* Dennis W. Carlton & Michael Waldman, *The Strategic Use of Tying To Preserve and Create Market Power in Evolving Industries*, 33 RAND J. ECON. 194 (2002); Michael D. Whinston, *Tying, Foreclosure, and Exclusion*, 80 AM. ECON. REV. 837 (1990).

6 Neither Whinston nor Carlton and Waldman allow for marginal or fixed cost savings of bundling in their models. *See* Carlton & Waldman, *supra* note 5; Whinston, *supra* note 5. We do not mean this observation as a criticism of these or related articles, but rather as a caution against drawing improper policy inferences from them. In light of Chicago School arguments that firms do not have incentives to use tying to foreclose, laying out the broad outlines of a theory of anticompetitive tying that is valid despite those arguments is a significant contribution. But assuming away efficiencies to elucidate the logic of foreclosure should not be taken to mean that efficiencies do not exist in real cases.

7 Here and throughout this article we use the term "monopoly" to refer to firms that have significant market power in that they can raise price substantially above the levels that would prevail in an industry in which firms on average earn only competitive rates of return.

8 *See* Int'l Salt Co. v. United States, 332 U.S. 392, 396 (1947) ("The tendency of the [tying] arrangement to accomplishment of monopoly seems obvious."); *see also* Standard Oil Co. of Cal. v. United States, 337 U.S. 293, 305 (1949) ("Tying arrangements serve hardly any purpose beyond suppression of competition.").

nor the ability to leverage its monopoly into another market.[9] Tying could, however, be used for price discrimination,[10] which does not generally reduce aggregate social welfare.[11] The post-Chicago literature has identified circumstances in which the single-monopoly-profit theorem does not hold and in which tying could be used to profitably foreclose competition, thereby reducing social welfare.[12]

Today, price discrimination and foreclosure of competition are the two leading explanations for tying. But they can only explain tying by firms that have market power. Economists recognize that tying can result in cost savings for producers and consumers as well as improvements in product quality. However, this efficiency explanation is often assumed away in theoretical models in order to focus on other explanations.[13]

Yet casual empiricism suggests that efficiencies must be the major explanation for tying: tying is common in competitive markets[14] and therefore cannot result mainly from foreclosure or from price discrimination. Just to name a few, the following competitive markets tie one product to another: airlines (passenger seat and baggage transport), apartments (appliances and mailboxes are included with the rooms); cigarettes (the filter and the tobacco are combined for most brands); encyclopedias (you must purchase the entire set of volumes); dental services (anesthesia and cavity repair are only sold together); newspapers (the sports section cannot be purchased separately from the front page);

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9 ROBERT H. BORK, THE ANTITRUST PARADOX 373-81 (1978); Aaron Director & Edward H. Levi, *Law and the Future: Trade Regulation*, 51 NW. U. L. REV. 281 (1956).

10 JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 193-94, 333-35 (1988).

11 *See* Hal R. Varian, *Price Discrimination*, *in* 1 HANDBOOK OF INDUSTRIAL ORGANIZATION 597 (Richard Schmalensee & Robert D. Willig, eds., 1989); *see also* Benjamin Klein & John Shepard Wiley, Jr., *Competitive Price Discrimination as an Antitrust Justification for Intellectual Property Refusals To Deal*, 70 ANTITRUST L.J. 599 (2003).

12 *See* Whinston, *supra* note 5. In some theoretical models in the recent literature, "foreclosure" of the market for the tied good is used to protect monopoly power in the market for the tying good, not to leverage one monopoly into a second. In these models, tying involves foreclosure but not leverage. Carlton & Waldman, *supra* note 5, at 195. For simplicity, this paper uses the term "foreclosure" to refer to either type of effect.

13 A recent report on bundling and tying by Barry Nalebuff, a leading contributor to the literature, is but one example of how economists put efficiency explanations to one side. (Tying is a special case of bundling, as we discuss below.) After presenting a "complete list" for why firms bundle, he notes: "Perhaps the most obvious reason to bundle two products is that this leads to a cost saving or quality improvement or both." He elaborates on efficiencies for nearly three pages, part of which considers and ultimately rejects the possibility that efficiencies are harmful. He then devotes nearly thirty pages explaining ten additional reasons for bundling and tying that are not related to efficiencies. BARRY NALEBUFF, BUNDLING, TYING, AND PORTFOLIO EFFECTS: PART 1, CONCEPTUAL ISSUES, at 31 (U.K. Dep't of Trade & Indus., DTI Economics Paper No. 1, Feb. 2003); Barry Nalebuff, *Bundling as a Barrier to Entry*, 119 Q.J. ECON. 159 (2004).

14 We use the phrase "competitive markets" to refer to ones in which firms do not persistently earn above-normal rates of return, either because of multiple firms in the market or because of the threat of entry. Firms in competitive markets can thus have some limited degree of short-run market power. Our cost-based theory of competitive tying incorporates this notion of competition by assuming that markets are contestable in the sense that the threat of entry prevents prices from significantly exceeding average costs. See *infra* Part II for more details.

restaurant service (water and bread frequently appear automatically, regardless of what you order); shoes (left and right shoes are not sold separately, and shoe laces are included as well).

Beyond the observation that bundling can create efficiencies, the economics literature has little more to say, either empirically or theoretically. That is all the more problematic because, as we will show, the efficiency explanations are not as simple as they might first appear. Economics therefore does not have a complete positive theory that explains why we observe tying in markets with any degree of competition.

This deficiency in the economics literature has practical importance for antitrust law. Ever since the Supreme Court's *Jefferson Parish* decision, courts have recognized the importance of distinguishing between anti-competitive explanations for tying and efficiency explanations.[15] We discuss this further below. For now, we observe that economics has not provided the courts with much help. Foreclosure theories show that tying could be anticompetitive under special conditions that are difficult and perhaps impossible to verify in practice.[16] And the literature provides scant guidance on the efficiency side—the main focus of this paper.

Efficiencies and Tying in Competitive Markets

Bundling—offering two or more products at a single price—can provide efficiencies such as marginal cost savings, quality improvements, and customer convenience. Bundling enables producers to offer the bundle more cheaply or to provide more value to consumers who want both products.[17] But even with these efficiencies, we would also expect firms to offer the products separately to those customers who value one product at less than the marginal cost of adding it to the bundle. And in fact many firms do just this, offering the bundle as well as the components.

Tying is a special case of bundling in which consumers do not have the choice of buying the "tied" product without the "tying" product.[18] Many firms in competitive markets practice tying as well. We present a theory of cost-based bundling, showing that firms in competitive markets *may* find it efficient to tie when they can economize on the fixed cost of product offerings or when they

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15 Jefferson Parish Hosp. v. Hyde, 466 U.S. 2 (1984); *see also* Eurofix-Bauco v. Hilti, Commission Decision 88/138/EEC, 1988 O.J. (L 065) 19.

16 *See* Ahlborn et al., *supra* note 2; *see also* Keith N. Hylton & Michael Salinger, *Tying Law and Policy: A Decision-Theoretic Approach*, 69 ANTITRUST L.J. 469 (2001).

17 This article focuses on the case in which the bundle includes discrete products that could be sold separately. However, similar considerations apply to the situation in which firms make choices on integrating product attributes together rather than creating separable components.

18 In the economics literature, the term "mixed bundling" means offering the goods separately and in combination with a discount for the combination. "Pure bundling" means offering the goods only as a package. Pure bundling is a form of tying, as is selling the package and just some of the components.

can realize product-specific scale economies. And of course if firms in competitive markets can tie for efficiency reasons, so can firms with significant market power.

Fixed cost savings from bundling have two implications. First, it may not be efficient to provide one of the products separately even though some consumers might prefer it. Enough customers must want both of the separate items to justify the additional fixed costs. That is why it is not possible to buy left shoes alone even though some people might want to do so—those perhaps with no right leg or with a dog who has eaten their left shoe. Second, and more subtly, tying increases demand for the tied item and thereby allows the seller to achieve greater scale on it than if the seller offered the items separately.[19]

Three facts established in this paper have important implications for tying doctrine: tying occurs in competitive markets; product-specific scale economies are needed to understand tying; and product-specific scale economies may be hard to detect even when they are present. From these points, we draw two principal conclusions.

First, per se condemnation of tying in its various manifestations is wrong as a matter of economics.[20] Neither the *Jefferson Parish* test in the United States nor the *Hilti/Tetra Pak II* approach in the European Union is capable of distinguishing anti-competitive from pro-competitive tying.[21]

Second, because it is hard to prove efficiencies even when practices could not arise for anticompetitive reasons, it might also be hard to prove efficiencies required even by a rule of reason, much less whatever limited efficiency defense is allowed under the current per se rule. Both approaches will therefore result in the frequent condemnation of efficient tying—a high rate of false convictions—if the tying firm has to bear a substantial burden of proof of showing efficiencies as it does under current approaches.[22]

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19 Effects similar to this can arise from network effects even if product-specific scale economies do not exist. For example, suppose that network effects exist for the tying good but are affected by the presence of the tied good. That is, the tying good alone might be thought to constitute one network, and the bundle of the tying and tied goods to constitute another network. A vendor could conclude that while some customers would prefer to purchase the goods separately, the resulting lost network effects for *other* customers reduce the overall value of the system to customers as a whole. David S. Evans, *The Antitrust Economics of Multi-Sided Platform Markets*, 20 YALE J. ON REG. 325, 370 (2003). See also Jean-Charles Rochet & Jean Tirole, Tying in Two-Sided Markets and the Impact of the Honor All Cards Rule (2003) (working paper, on file with authors), for an application of this to the honor-all-cards rule that was the subject of the Wal-Mart litigation mentioned above.

20 We are not aware of any articles in a mainstream economics journal or by an economist in a law review that finds that the *Jefferson Parish* rule could distinguish pro-competitive from anti-competitive tying. *See* Ahlborn et al., *supra* note 2; Evans et al., *A Pragmatic Approach to Identifying and Analyzing Legitimate Tying Cases*, *in* EUROPEAN COMPETITION LAW ANNUAL 2003: WHAT IS AN ABUSE OF A DOMINANT POSITION? (forthcoming November 2005); Hylton & Salinger, *supra* note 16.

21 For a discussion of the EU approach, see Ahlborn et al., *supra* note 2.

22 As we have pointed out elsewhere, Professor Nalebuff's results support this. He reevaluates several leading tying cases in the United States and Europe. His results show a high rate of error under his evaluation. *See* NALEBUFF, *supra* note 13. For further discussion of the error-cost issue, see Evans et al., *supra* note 20.

Organization and Overview

In Part I we elaborate on the development of the legal doctrine on tying, the development of the economics literature on bundling and tying, and the relationship between the two. Our legal discussion focuses on *Jefferson Parish*, which, we argue, rejects a plausible efficiency justification for the tie at issue. We then argue that while the legal doctrine is flawed, the economics literature has not provided a helpful framework for evaluating tying either. We describe the two main strands of the literature: price discrimination and strategic foreclosure.

In Part II we show how efficiencies can give rise to tying in competitive markets (and therefore in monopoly markets as well). When there are product-specific fixed costs, tying can arise under competition even if a significant group of customers wants just one component of a bundled product. Tying can arise when bundling provides great savings or convenience, and the fixed costs of offering a component of the bundle separately are large relative to the demand for the separate component. It can also arise when there are moderate fixed cost savings but low demand for a separate component. Although the model we present is simple, it provides general insights and helps motivate the three case studies to which we then turn.

Part III examines cold remedies in which several different active ingredients are combined into a single product. The efficiencies from bundling appear to be substantial, so the bundled product serves the needs of some customers much better than would buying the component products separately. In this case, the efficiencies do not always give rise to tying—separate products are also offered by some sellers. But the same cost structures in a market with greater scale economies or less demand could result in tying.

Part IV considers a group of four electrical adapters sold only as a package by RadioShack—not all the products are offered separately, so the package is a tie. We argue that the tie occurs because the package appeals to several different sets of customers while conserving on the fixed costs of stocking different adapters as well as on packaging costs.

The third case is the tying of optional equipment on automobiles, considered in Part V. We consider three competing mid-sized sedans over the period 1986-2004. At the beginning of the period, Ford did not tie the options it made available on the Taurus. In contrast, Toyota and Honda did tie options to a much greater extent on the Camry and the Accord. Over time, Ford's strategy came to resemble that of Toyota and Honda. We link this trend toward tying under competition to the accounting and management science literature on the cost of product complexity. Offering fewer product variants reduces costs in ways that are real and substantial but hard to document.

Part VI considers the implications of these cases and our general analysis for tying law. In each of three case studies we show that cost savings is the

most plausible explanation for the practice. If the markets in which these products are sold were not competitive, we would not so quickly reject price discrimination or foreclosure as alternative explanations. Moreover, the most easily documented efficiencies are those from bundling (our pharmaceutical case provides an example). The efficiencies that give rise to tying, such as those that we document in the automobile case, are subtler and might be harder to document. Since those efficiencies would be at the heart of any efficiency defense in a tying case, there is a risk that the finder of fact, who focuses only on the case at hand and ignores the fact that tying is common in competitive markets and is presumptively efficient, will not be able to correctly explain the tying practice. A rational legal doctrine must acknowledge the difficulty of understanding any particular business practice and the risks and costs of judicial error.[23] That risk will depend partly on who bears the burden of proof and how high that burden is. We conclude that the antitrust analysis of tying should be based on the rule of reason and, importantly, that once a defendant has put forward a plausible efficiency defense for the practice the plaintiff should bear the burden of showing that the defense is pretextual.[24]

I. Tying: The Law and the Economics Literature

Tying is an anomaly in United States antitrust doctrine. It is per se illegal even though it more nearly resembles the sorts of practices that are judged under a rule of reason.[25] It is the only significant area of antitrust law in which the courts have not adopted an economic approach in the last quarter century.[26] To be sure, the per se ban on tying is different from the ban on price fixing because certain other conditions must be present to trigger the per se treatment. Still, it would not be accurate to characterize the nominal per se standard as being functionally the same as a rule of reason. When a restraint could be

23 For the classic treatment, see Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1 (1984). *See also* David S. Evans & A. Jorge Padilla, *Designing Antitrust Rules for Assessing Unilateral Practices: A Neo-Chicago Approach*, 72 U. CHI. L. REV. (forthcoming Winter 2005).

24 This approach is therefore more consistent with the approach endorsed by the D.C. Circuit in its evaluation of the alleged tie of Microsoft Windows and Internet Explorer under the consent decree entered into by Microsoft and the U.S. Department of Justice, United States v. Microsoft Corp., 147 F.3d 935 (D.C. Cir. 1998) [hereinafter *Microsoft II*], which considered the consent decree entered into in United States v. Microsoft Corp., 56 F.3d 1448 (D.C. Cir. 1995) [hereinafter *Microsoft I*], than with the Court's evaluation of the alleged tie under the Sherman Act case brought by the Justice Department and several states, United States v. Microsoft Corp., 253 F.3d 34 (D.C. Cir. 2001) [hereinafter *Microsoft III*].

25 It resembles a practice usually considered under the rule of reason because there is no strong presumption in economics that tying will harm consumers, and it provides efficiencies unlike all other practices covered under the usual per se standard.

26 *See, e.g.*, Todd J. Anlauf, *Severing Ties with the Strained Per Se Test for Antitrust Tying Liability: The Economic and Legal Rationale for A Rule of Reason*, 23 HAMLINE L. REV. 476, 478-79 (2000) ("The current per se test has been strained to accommodate some economic analysis and even limited affirmative defenses, but the analysis falls short of the full balancing necessary to determine the economic effects of tying arrangements. Thus, a rule of reason approach used for several other areas of antitrust law should be adopted to evaluate tying arrangements.").

characterized in a number of different ways, such as a predatory or exclusionary practice in violation of section 2 of the Sherman Act (and evaluated under the rule of reason), or tying (as a contract in restraint of trade) under section 1 of the Sherman Act or section 3 of the Clayton Act, plaintiffs in our experience usually opt for tying.[27] Although the rule-of-reason approach in *Microsoft III*[28] has been cited by the courts,[29] they remain reluctant to depart from *Jefferson Parish*. This reluctance appeared most recently in the federal district court's summary judgment decision in *In re Visa CheckCard/MasterMoney Antitrust Litigation*.[30] The court applied a per se test and found on summary judgment that the main elements of that test had been met.[31] It allowed the possibility that liability required evidence of an anticompetitive effect in the tied market, and left this for a jury trial. MasterCard and Visa quickly agreed to a settlement.[32]

The European Commission recently found that Microsoft abused a dominant position in violation of Article 82 of the EC Treaty by not offering computer manufacturers and end users the choice of obtaining Windows without certain media player technologies.[33] Although the Commission indicated that it used a rule-of-reason approach,[34] the decision relied on a test similar to the modified per se test employed in the United States.[35]

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27 *See* Sherman Antitrust Act §§ 1-2, 15 U.S.C. §§ 1-2 (2004); Clayton Act § 3, 15 U.S.C. § 14 (2004).

28 253 F.3d 34.

29 *See, e.g.*, CCBN.com, Inc. v. Thomson Fin., Inc., 270 F. Supp. 2d 146, 156 (D. Mass. 2003); Indep. Ink, Inc. v. Trident, Inc., 210 F. Supp. 2d 1155, 1162 (C.D. Cal. 2002).

30 No. 96-CV-5238, 2003 U.S. Dist. LEXIS 4965, at *6 (E.D.N.Y. Apr. 1, 2003).

31 *See infra* Section I.A for a description of the per se test's four conditions.

32 Howard H. Chang et al., *The Retailer Class Action Antitrust Case Against the Card Associations*, 2 PAYMENT CARD ECON. REV. 123, 139-40 (2004).

33 Case COMP/C-3/37.792-Microsoft, Commission Decision (March 24, 2004).

34 As a top EU antitrust official stated,

> I would like to stress that the Commission has not ruled that tying is illegal per se, but rather developed a detailed analysis of the actual impact of Microsoft's behavior, and of the efficiencies that Microsoft alleges. In other words we did what the US Court of Appeals suggested be done: we used the rule of reason although we don't call it like that in Europe.

Press Release, Delegation of the European Commission to the United States, Microsoft: Statement by E.U. Commissioner Mario Monti (Mar. 24, 2004), http://www.eurunion.org/news/press/2004/20040047.htm. *See also* Maurits Dolmans & Thomas Graf, *Analysis of Tying Under Article 82 EC: The European Commission's Microsoft Decision in Perspective*, 27 WORLD COMPETITION 225 (2004); David S. Evans & A. Jorge Padilla, *Tying Under Article 82 EC and the Microsoft Decision: A Comment on Dolmans and Graf*, 27 WORLD COMPETITION 503 (2004).

35 As the Commission explained,

> Tying prohibited under Article 82 of the Treaty requires the presence of the following elements: (i) the tying and tied goods are two separate products; (ii) the undertaking concerned is dominant in the tying product market; (iii) the undertaking concerned does not give customers a choice to obtain the tying product without the tied product; and (iv) tying forecloses competition.

Microsoft Commission Decision, *supra* note 33, at ¶ 794.

A. *The Law*[36]

The Supreme Court last considered the law of tying in *Jefferson Parish.*[37] East Jefferson Hospital, in Jefferson Parish, Louisiana, had an exclusive contract with an anesthesiology practice to provide anesthesiology services to the hospital's surgery patients. Edwin Hyde, an anesthesiologist, claimed this was an illegal tie. The Court found unanimously that the arrangement in this case was legal, but it was sharply divided over why. In a concurring opinion joined by three other Justices, Justice O'Connor argued for ending the per se ban on tying. She conceded that the per se rule was never quite as draconian as it appeared, but she claimed nonetheless that defendants should be able to offer an explicit efficiency defense under the rule of reason. In contrast, the majority voted to retain the per se rule. Writing for the majority, Justice Stevens wrote, "[i]t is far too late in the history of our antitrust jurisprudence to question the proposition that certain tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable '*per se*.'"[38] This quote suggests that the majority might not choose per se treatment if it could start over. As a result, one might suspect that the Court would try to reframe the necessary conditions for the per se rule to create, for all practical purposes, a rule of reason.

The *Jefferson Parish* test finds a per se violation when the following four conditions are satisfied: first, there must be two products; second, the two products must be tied; third, the seller must have market power in the tying product; fourth, a not insubstantial volume of commerce must be affected.[39] A fifth condition, that there must be an anticompetitive effect in the market for the tied good, has been applied to different extents by the circuit courts, although not without controversy.[40]

This four-condition test enables the courts to consider efficiencies indirectly and therefore incorporates elements of a rule-of-reason analysis. In

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36 We focus here on the aspects of the tying law that are relevant for our discussion later. For detailed surveys of the tying cases, see Hylton & Salinger, *supra* note 16, and Ahlborn et al., *supra* note 2. For a detailed discussion of *Jefferson Parish*, see William J. Lynk, *Tying and Exclusive Dealing:* Jefferson Parish Hospital v. Hyde (1984), *in* THE ANTITRUST REVOLUTION 342 (John E. Kwoka & Lawrence J. White eds., 3d ed. 1999).

37 Jefferson Parish Hosp. v. Hyde, 466 U.S. 2 (1984). Other Supreme Court tying cases include: United States Steel Corp. v. Fortner Enter., Inc., 429 U.S. 610 (1977); White Motor Co. v. United States, 372 U.S. 253 (1963); United States v. Loew's Inc., 371 U.S. 38 (1962); N. Pac. Ry. Co. v. United States, 356 U.S. 1 (1958); Times-Picayune Publ'g Co. v. United States, 345 U.S. 594 (1953); United States v. Paramount Pictures, Inc., 334 U.S. 131 (1948); and Int'l Salt Co. v. United States, 332 U.S. 392 (1947).

38 *Jefferson Parish*, 466 U.S. at 9. The Supreme Court has been willing to alter other aspects of antitrust doctrine. A prime example is the *Matsushita* decision, which substantially raised the standard for establishing a predatory pricing claim. Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574 (1986).

39 *See* PHILLIP E. AREEDA, 9 ANTITRUST LAW ¶ 1702 (1991).

40 *Id.*

evaluating whether anesthesiology and surgery are separate products, the Court ruled that "[i]n this case, no tying arrangement can exist unless there is sufficient demand for the purchase of anesthesiology services separate from hospital services to identify a distinct product market in which it is efficient to offer anesthesiological services separately from hospital services."[41] However, the history of the case should give one pause that the separate product test allows for a serious consideration of efficiencies. The district court found significant efficiencies, the Fifth Circuit dismissed them, and the Supreme Court relied on the market power screen to find for the hospital.[42]

East Jefferson Hospital had thirteen operating rooms. Nurse anesthetists provided the anesthesiology in most cases. The anesthesiologists in the group with the exclusive deal provided supervision. One might interpret this form of organization as being efficient. The district court thought so:

> The evidence presented was that defendants instituted a closed system anesthesiology department because they believed the system resulted in the best quality of patient care. Specifically the system insures twenty-four hour anesthesiology coverage, aids in the control and standardization of . . . operations because it is not necessary to accommodate physicians with outside commitments; it permits the physicians, nurses, and other technicians in the department to develop a work routine and a proficiency with the equipment they use in patient treatment; and it increases the Board's ability to monitor the medical standards exercised because there are fewer individuals involved, maintenance of equipment is simplified and equipment breakdowns are minimized by limiting use to one group of physicians.[43]

This efficiency explanation strikes us as persuasive, although the posited cost savings may be difficult to document, much less quantify.

The head of the anesthesiology practice at East Jefferson Hospital testified that his group would have provided twenty-four hour coverage without a contractual requirement to do so. That was, apparently, enough for the Fifth Circuit to conclude that the provision of continuous coverage, one basis of the claimed efficiencies, could be "rebutted quite easily."[44] But it is not hard to see that the hospital might have reasonably preferred an enforceable contract rather than the good word of this or any other anesthesiologist—and that this might have benefited its patients. Part of the problem here is the burden of proof, to which we will return later: tying efficiencies may be hard to document, and a defendant may have a difficult time proving them well enough to satisfy a court that is predisposed against tying.

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41 *Jefferson Parish*, 466 U.S. at 21-22.

42 We do not in this paper address the distinction between the legal standards toward tying and toward product integration. The courts have historically been reluctant to treat product integration as tying, and the law is therefore substantially less hostile to technological integration than to tying. *See* Hylton & Salinger, *supra* note 16. Because the distinction between technological integration and contractual tying is often not clear, however, this has emerged as a key issue in computer software. *See, e.g.*, *Microsoft II*, 147 F.3d 935 (D.C. Cir. 1998). In our framework, technological integration can be a source of bundling economies and could be treated as part of a unified doctrine that covers both contractual tying and product integration.

43 Hyde v. Jefferson Parish Hosp., 513 F. Supp. 532, 540 (E.D. La. 1981), *rev'd*, 686 F.2d 286 (5th Cir. 1982), *rev'd*, 466 U.S. 2 (1984).

44 686 F.2d at 288 n.2, *rev'd*, 466 U.S. 2 (1984).

The Supreme Court agreed that anesthesiology and hospital services were distinct products—and that it was efficient to provide them separately.[45] So it rejected the cost savings found by the district court and sided with the Fifth Circuit. But it found that the hospital lacked significant market power, so the arrangement could not have anticompetitive effects.[46] This analysis raises some troublesome questions. As we will see in the next Section, even if the hospital had market power, it is not obvious how it could profit by tying anesthesiology services to hospital services. And given that the hospital did not have market power, according to the Supreme Court, it could not have engaged in a profitable anticompetitive strategy.[47] So under the Court's view, the hospital must have engaged in the practice in error. Perhaps the strategy was efficient after all.

B. *The Economics Literature*

The formal economics literature on tying has gone through two distinct stages over the last thirty-five years. The first was the price discrimination strand started by Stigler,[48] who offered the explanation as an alternative to the leveraging theory adopted by the courts. Then, starting in the early 1990s, the literature has revived the foreclosure theory, intuited by the courts, by providing it with rigorous game-theoretic foundations that can apply in specific circumstances.

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45 466 U.S. at 21-23.

46 *Id.* at 27.

47 *Id.* at 27-28.

48 George J. Stigler, *A Note on Block Booking*, *in* THE ORGANIZATION OF INDUSTRY 165 (1968). Bundling is of economic interest only if the bundle price is different from the sum of the components prices. There is price discrimination if these differences are not the result of cost differences (i.e. efficiencies). Although foreclosure strategies could also lead to price differences we treat those separately and therefore reserve the term price discrimination for those cases where the motive for the bundling is based neither on efficiency nor foreclosure reasons. The price-discrimination models we consider assume that the seller is a monopolist and evaluate whether bundling yields higher profits than simple monopoly pricing (i.e., a constant price per unit that does not depend on the purchase of another good). Simple monopoly pricing leaves consumers with some surplus (because some consumers are willing to pay more than the monopoly price) and leaves other consumers without the product even though they are willing to pay more than the marginal cost of production (but they do not buy because they value the good at less than the monopoly price). This consumer surplus that is lost from not supplying this second group is known as "deadweight loss." Bundling by a monopolist can be profitable if it allows the firm to capture either extra surplus from consumers who are willing to pay more than the monopoly price or to make additional sales to consumers who are not willing to pay more than the monopoly price.

1. The Price Discrimination Strand

There are two price discrimination explanations for bundling.[49] The first, from Stigler, is that tying enables firms to extract more consumer surplus from consumers who place different valuations on the separate goods.[50] The second explanation, due to Bowman, is that tying a consumable product to a durable product may help firms charge more for consumers with greater demand for the durable good.[51]

Stigler's seminal piece concerned block booking of films in the case of *United States v. Loew's, Inc.*[52] The issue in the case was the requirement that movie theaters take a distributor's Grade B movies along with its Grade A movies. The allegation in the case, typical in tying cases, was that the practice was a way of leveraging market power from Grade A to Grade B movies. Stigler challenged this interpretation and provided a simple alternative explanation based on a numerical example.

A slightly modified version of his example goes as follows. Suppose there are two goods (*A* and *B*) and two customers (*I* and *II*). Customer *I* is willing to pay 10 for *A* and 4 for *B*. Customer *II* is willing to pay 4 for *A* and 11 for *B*. The marginal cost of both goods is 0. Without bundling, the prices for goods *A* and *B* are 10 and 11, respectively. Customer *I* buys *A* but not *B*, customer *II* buys *B* but not *A*, and consumer surplus is 0. With bundling, the seller charges 14 for the bundle. Both consumers buy the bundle (and, therefore, both components). Customer *II* gets a surplus of 1. The seller's profits go up from 21 to 28.[53] This simple example contains an explanation for why bundling may be beneficial for consumers in some cases. Customers who desire the entire bundle (as both customers do in our modified example) pay a lower price than they would if the seller had to sell the components separately. When bundling increases consumer surplus, it does so because the gains to the group that

49 Both effects were discussed by Director & Levi, *supra* note 9, at 289-92, and expanded on by Stigler, *supra* note 48, and Ward S. Bowman, Jr., *Tying Arrangements and the Leverage Problem*, 67 YALE L.J. 19 (1957).

50 Several articles over the years have explored this basic explanation at greater levels of generality. *See* William James Adams & Janet L. Yellen, *Commodity Bundling and the Burden of Monopoly*, 90 Q.J. ECON. 475 (1976); Yannis Bakos & Eric Brynjolfsson, *Bundling Information Goods: Pricing, Profits, and Efficiency*, 45 MGMT. SCI. 1613 (1999); R. Preston McAfee et al., *Multiproduct Monopoly, Commodity Bundling, and Correlation of Values*, 104 Q.J. ECON. 371 (May 1989); Richard L. Schmalensee, *Gaussian Demand and Commodity Bundling*, 57 J. BUS. 211 (1984).

51 Bowman, *supra* note 49.

52 Stigler, *supra* note 48.

53 In Stigler's example, one customer would pay $8,000 for film *X* and $2,500 for film *Y*. The other customer would pay $7,000 for film *X* and $3,000 for *Y*. This choice of numbers more nearly matches Grade A and Grade B movies, but it is not as effective for illustrating why consumers might welcome bundling by a multiproduct firm.

wants both components exceed the costs to people who want just one component and are forced to buy the bundle instead.[54]

Stigler's explanation relies on heterogeneous consumers. It may help explain why bundling is especially relevant to the growing information goods portion of the economy. Many of these goods have negligible marginal costs. Bakos and Brynjolfsson show that when marginal costs are low or zero, bundling goods together increases demand for a product without increasing costs.[55] This might well explain the bundling of diverse networks into basic cable television service[56] and the bundling of various types of content (e.g., the news, sports, and style) in a single newspaper.[57] The fixed costs savings that we discuss below reinforce these incentives.

Tying has also been explained by the literature as a metering device.[58] The classic example is IBM tying its punch cards to its card-punching machines.[59] By requiring its customers to use IBM punch cards and charging supra-competitive prices for them, IBM could elicit higher total margins from customers that used its machines intensively than from those who used its machines less. This motive would seem to be present in a wide variety of circumstances in which a company sells an apparatus that requires supplies that vary with usage. Examples include copy machines and copies[60] as well as cameras and film processing.[61]

2. The Foreclosure Literature

The next stage of development in the tying literature returned to the possibility that firms tie products to preserve or extend market power, the original foundation for the legal concern with tying. Arguing that a monopolist could extract its profits only once and that there was no obvious reason to do so by tying, the Chicago School challenged the logic of the leverage. It is now understood that the single-monopoly-profit theorem rests on strong

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54 In this example, offering the bundle rather than the components does not make any customer worse off. Thus, the example only illustrates the potential gain from bundling, not the potential cost.

55 Bakos & Brynjolfsson, *supra* note 50.

56 Michael A. Salinger, *A Graphical Analysis of Bundling*, 68 J. BUS. 85, 97 (1995).

57 Bakos & Brynjolfsson, *supra* note 50.

58 For an initial economic discussion, see M.L. Burstein, *The Economics of Tie-In Sales*, 42 REV. ECON. & STAT. 68 (1960). For explicit modeling see Walter Y. Oi, *A Disneyland Dilemma: Two-Part Tariffs for a Mickey Mouse Monopoly*, 85 Q.J. ECON 77 (1971), and L.G. Telser, *A Theory of Monopoly of Complementary Goods*, 52 J. BUS. 211 (1979). Also see Bowman, *supra* note 49, for a discussion of the legal implications.

59 Int'l Bus. Mach. Corp. v. United States, 298 U.S. 131 (1936).

60 SCM Corp. v. Xerox Corp., 645 F.2d 1195 (2d Cir. 1981).

61 When issues like this arise, there is typically a claimed efficiency. IBM argued that its machines would only work properly if used with its punch cards. A prominent set of cases in Europe concerned Tetra Pak, which sells packaging systems for milk and other consumable liquids. Tetra Pak II, Commission Decision 92/163/EEC, 1992 O.J. (L 072) 1; Case T-83/91, Tetra Pak Int'l S.A. v. Commission, 1994 E.C.R. II-755.

assumptions. Aghion and Bolton's analysis of long-term contracts, which can be thought of as tying sales in different periods, provided the basic insight of this literature.[62] Whinston was the first to present a formal model of how contemporaneous tying can be a profitable strategy to deter entry.[63] Carlton and Waldman, Nalebuff, and Choi and Stefanadis provide notable recent extensions.[64]

As these models are complicated, a complete exposition of them is beyond the scope of this article.[65] Still, it is important to be clear about both the nature and the limitations of the contributions these articles make. The models demonstrate the theoretical possibility of tying to foreclose entry. They thereby provide a necessary correction to the Chicago view (among some adherents) that profitable foreclosure is never possible. The new models rest, however, on very restrictive assumptions. One is that bundling generates no efficiencies. Without allowing for possible efficiencies, the models cannot weigh the offsetting welfare effects of efficiency and foreclosure. Moreover, even if one were to incorporate efficiencies into the models, the remaining assumptions are so stylized that it is hard to know when they apply—if ever.[66] As it currently stands, the literature represents a significant scholarly contribution which, with further work, might yield useful policy insights. The existing literature by itself, though, does not give the antitrust authorities or the courts much practical guidance on how to determine whether a particular tie harms consumer welfare.[67]

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62 Philippe Aghion & Patrick Bolton, *Contracts as a Barrier to Entry*, 77 AM. ECON. REV. 388 (1987).

63 Whinston, *supra* note 5.

64 Carlton & Waldman, *supra* note 5; *see also* Jay Pil Choi & Christodoulos Stefanadis, *Tying, Investment, and the Dynamic Leverage Theory*, 32 RAND J. ECON. 52 (2001); Nalebuff, *supra* note 13.

65 Hylton & Salinger, *supra* note 16, uses numerical examples to exposit the essential features of the models.

66 Ahlborn et al., *supra* note 2, at 335-36.

67 The authors of these articles agree with this point. Whinston was quite careful not to draw strong policy implications from his model.

> While the analysis vindicates the leverage hypothesis on a positive level, its normative implications are less clear. Even in the simple models considered here, which ignore a number of other possible motivations for the practice, the impact of this exclusion on welfare is uncertain. . . . [T]he difficulty of sorting out the leverage-based instances of tying from other cases, makes the specification of a practical legal standard extremely difficult.

Whinston, *supra* note 5, at 855-56. Carlton and Waldman state, "we would like to caution that trying to turn the theoretical possibility for harm shown here into a prescriptive theory of antitrust enforcement is a difficult task." Carlton & Waldman, *supra* note 5, at 215. *See also* Michael D. Whinston, *Exclusivity and Tying in U.S. v. Microsoft: What We Know, and Don't Know*, 15 J. ECON. PERSP. 63, 79 (2001):

> What is striking about the area of exclusive contracts and tying, however, is how little the current literature tells us about what these effects are likely to be. This state of (non) knowledge is, I think, responsible to a significant degree for the very strong but differing beliefs that economists often have about whether exclusive contracts and tying are likely to have welfare-reducing anticompetitive effects.

II. The Role of Costs in Tying

Although there has been essentially no empirical research into efficiencies from bundling and tying products together, it is not hard to imagine where efficiencies might come from. Many products have packaging and distribution costs. Using the same packaging and distribution for multiple products can reduce marginal costs, especially for products whose marginal costs of production are low relative to the marginal costs of packaging and distribution. Reducing product varieties may also reduce costs by eliminating the need for shelf space and the administrative and transaction costs associated with having multiple product lines. Consumers may realize lower transaction costs or greater convenience when they can buy multiple products they want together.

This Part develops a model that provides insights into how the costs of offering multiple product combinations, together with the existence of consumers who place differing values on these combinations, might give rise to tying. Section A describes the model and its principal results. Section B describes the formal assumptions and uses numerical examples to show how variations in costs and demand can lead to different product configurations, including ones that correspond to tying.[68] Section C summarizes the insights from the cost-based theory.

A. *Overview of a Cost-Based Model of Bundling and Tying*

Consider the case of several products that can be sold either separately or together. Consumers get the greatest product choice when they can buy the products either separately or combined. Tying results in a limitation on product variety—consumers do not have the choice of buying the tied product separately from the other products with which it is bundled. That reduction in product choice may be socially efficient if it makes consumers as a group better off by lowering prices for the combinations that are offered, or if there is not sufficient demand to offer the tied product on a stand-alone basis. In this Section we explore the role of costs in explaining why firms in competitive markets eliminate product choices.

Before we discuss our approach it is useful to note an important insight on bundling from the literature on optimal product variety. This literature[69] grew

68 For a formal exposition of the theory, see David S. Evans & Michael Salinger, The Role of Cost in Determining When Firms Offer Bundles and Ties (2004) (working paper), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=555818.

69 *See, e.g.*, Avinash K. Dixit & Joseph E. Stiglitz, *Monopolistic Competition and Optimum Product Diversity*, 67 AM. ECON. REV. 297 (1977); Curtis B. Eaton & Richard G. Lipsey, *Product Differentiation*, *in* 1 HANDBOOK OF INDUSTRIAL ORGANIZATION, *supra* note 11, at 723; Steven Salop, *Monopolistic Competition with Outside Goods*, 10 BELL J. ECON. 141 (1979); Michael A. Spence, *Product Selection, Fixed Costs, and Monopolistic Competition*, 43 REV. ECON. STUD. 217 (1976).

out of Chamberlin's theory of monopolistic competition.[70] It addresses whether, in the presence of product-specific scale economies, the market provides too little variety, too much, or the right amount. The essential features of the models are fixed costs that give rise to scale economies, unique products that give rise to downward sloping demand curves for each firm, and free entry that prevents firms from earning economic profits. The models highlight a fundamental trade-off between exactly matching each customer's preferences and achieving economies of scale. The literature finds that under monopolistic competition firms may offer too few or too many varieties.

The broad assumptions of the product variety models—heterogeneous consumer preferences and fixed costs of product offerings—apply to bundled products and individual components, but the details of the existing models are not easy to adapt to the situation in which one product is a bundle of two other products.[71] Here we present a simple economic model with assumptions similar to the product variety literature but which are specifically designed to address bundling and tying. We use the model to help explain the case studies of bundling and tying in competitive industries.

In the model, there are two products, denoted *1* and *2*. We consider heterogeneous consumers—one group that wants only the first product, another that wants only the second, and a third that wants both. To capture efficiencies of bundling, we consider the possibility of marginal cost savings from providing the two products together: that is, the cost of providing an extra unit of both products is lower if they are provided in tandem. (While we posit these as cost savings to the firm, they could also be cost savings for the consumers or quality improvements for the consumers.) We also consider the role of fixed costs—on the one hand offering only a bundle could save some fixed costs of providing the components separately; on the other hand offering a bundle in addition to the components results in additional fixed costs. It turns out that these fixed costs and the product-specific scale economies they generate are critical to determine when tying occurs. Finally, to capture the absence of market power, we assume that the prospect of entry prevents firms from selling any product at more than the average total cost of providing it.[72]

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70 EDWARD H. CHAMBERLIN, THE THEORY OF MONOPOLISTIC COMPETITION (1933).

71 The fact that a bundle is a combination of two distinct products has implications for both cost and demand that are not easy to capture with the demand and cost structure of these models.

72 The theory of contestable markets considers price competition in the presence of scale economies and assumes that the threat of entry limits firms to charging a price equal to their average cost rather than to marginal cost (for multi-product firms with joint costs, "average cost" is not well defined, but a similar zero-profit condition holds). *See* WILLIAM J. BAUMOL ET AL., CONTESTABLE MARKETS AND THE THEORY OF INDUSTRY STRUCTURE 4ff, 47 (1982). The theory has fallen into disuse because of analytical problems, see Martin L. Weitzman, *Contestable Markets: An Uprising in the Theory of Industry Structure: Comment*, 73 AM. ECON. REV. 486 (1983)), and because empirical research failed to confirm the predictions of the theory in airlines, the industry that was often held out as the canonical example of a contestable market. See Elizabeth E. Bailey & John C. Panzar, *The Contestability of Airline Markets During Transition to Deregulation*, 44 J.L. & CONT. PROBS. 125 (1981), for the suggestion that airline markets should be considered contestable. See Steven A. Morrison &

Under these general assumptions it is possible for markets to provide different product varieties or, more precisely, configurations of the basic products. The five possible configurations, as shown in Table 1, are

(1) Pure component selling—each product is offered separately and not together;

(2) Mixed bundling—the two products are offered together as well as separately;

(3) Pure bundling—the two products are offered only together;

(4) Bundle plus the first component separately; and

(5) Bundle plus the second component separately.

Cases (2)-(5) involve bundling—the two products are offered together. Cases (3)-(5) involve tying—at least one of the two products is not offered separately. Note that we use "tying" strictly in an economic sense; only a subset of economic ties might ever be considered anticompetitive.[73]

Table 1. Product Availability Under Different Bundling Scenarios

	Good *1*	Good *2*	Goods *1* & *2*
Pure Components	Y	Y	N
Mixed Bundling	Y	Y	Y
Pure Bundling	N	N	Y
Bundle + *1*	Y	N	Y
Bundle + *2*	N	Y	Y

Note: Y indicates that the component or bundle is offered, and N denotes that it is not.

Which products are offered depends on the extent to which bundling lowers marginal cost, on the fixed costs of offering each product, and on demand. For a product to be offered in the kind of contestable market we describe here, three conditions must hold—these are known in the formal economics literature as sustainability conditions. First, no price can exceed average cost. Otherwise another firm could enter and provide the product to the same group of customers for less. Second, the price of each product must be low enough that the seller of a second existing product cannot profitably lower

Clifford Winston, *Empirical Implications and Tests of the Contestability Hypothesis*, 30 J.L. & ECON. 53 (1987), for evidence rejecting some predictions of the contestability hypothesis in the airline industry. We do not suggest that any of the markets we consider are perfectly contestable; however, to the extent that the primary constraint on firms' pricing behavior is the threat of entry, the contestability assumption might yield the best approximation among the available alternatives even if the threat of entry does not limit firms to zero economic profits.

73 A good example is pure bundling. Under *Jefferson Parish*, the plaintiff would have to show that there is a demand for the component.

its price and attract the purchasers of the first.[74] Third, prices must be low enough that entry with a product not offered is unprofitable.[75]

We derive several notable results.[76]

First, marginal cost savings are neither necessary nor sufficient for tying to occur in competitive markets. They are not necessary because, even without marginal cost savings, firms may not separately provide a product if there is not enough demand to cover the fixed cost of offering that product; this result assumes that the firm is offering a bundle that attracts at least some consumers who want that product. They are not sufficient because, even with marginal cost savings, firms may find that there are enough consumers who want the products separately and do not value the other product; they will therefore offer the bundle to attract consumers who want both and separate products to attract consumers who only want one.

Second, fixed costs are a necessary but not sufficient condition for tying to occur in competitive markets. Firms eliminate a product choice that some consumers want because it enables them to avoid the fixed costs of offering it separately. Or, to put it another way, firms cannot provide some products separately because there is not enough demand to cover the costs.

Third, pure bundling can arise for two reasons which are worth distinguishing: (1) moderate fixed costs when many consumers demand all components and demand is low for at least one of the individual components; and (2) high fixed costs. Without fixed costs, our assumptions generally imply mixed bundling. Under mixed bundling, the bundle is available for those who want both goods and the separate products are available for those who want just one. With some fixed costs, however, pure bundling can result if many customers want both goods and demand for the components does not justify the fixed cost of offering them separately. Pure bundling can also occur, however, even if no consumer wants both components. This will happen when fixed costs are very high, which in turn implies that pure bundling saves significant fixed costs over components selling.[77]

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74 Consider, for example, mixed bundling focusing on the prices of good *1* and the bundle. People who want just good *1* can meet their needs by buying good *1* as a separate item or by buying the bundle and discarding good *2*. For good *1* to be offered in a sustainable combination, the price of good *1* must be less than what the price of the bundle would be *when it is priced to attract the consumers who want just good 1 as well as the customers who want both components*. This condition is stronger than the condition that the price of good *1* be less than the price of the bundle *under mixed bundling*. For an elaboration, see the discussion of the example in Table 3 *infra*.

75 For example, pure components selling is only sustainable if there is no price at which the bundle could profitably be offered.

76 Evans & Salinger, *supra* note 68.

77 Personal computer software that comes in a box with both Windows and Mac versions illustrates this possibility. It is likely that everyone who buys the software wants one or the other, but not both. However, the single package with both versions saves the fixed cost of having two separate products.

Fourth, firms may sell some but not all of the components separately from the bundle. This occurs when demand for the bundle and one of the separate components is substantial but demand for the other is not.

In a separate welfare analysis we show that firms may not offer the optimal product variety (the standard result in the product variety literature) but that the tendency is to offer too much mixed bundling rather than to offer too much tying.[78]

B. *Model Assumptions and Numerical Examples*

In this Section, we briefly present the assumptions of the model and provide some numerical examples to illustrate the possible outcomes. There are two goods[79] denoted by subscripts *1* and *2* which can be sold either separately or bundled.[80] There are three classes of customers: type *1* customers want only good *1*, type *2* customers want only good *2*, and type *B* customers want both; X_1, X_2, and X_B are the numbers of each type of customer.[81] Let c_1 and c_2 be the constant marginal costs of producing goods *1* and *2*, and c_B the constant marginal cost of producing the bundle. F_1 and F_2 are the fixed costs of providing goods *1* and *2*, and F_B is the fixed cost of offering the bundle.

We introduce possible cost savings from bundling in two ways. First, we assume that $c_B \leq c_1 + c_2$; there are no marginal cost savings of bundling when equality holds. Second, we assume that $F_B \leq F_1 + F_2$; there are no fixed costs savings of bundling when equality holds. For expositional ease we consider the special case where $F_1 = F_2 = F_B = F$; that is when there is a fixed cost of offering each product, such as shelf space limitations or other distribution costs.

78 Evans & Salinger, *supra* note 68.

79 While the "goods" in the model can correspond to actual goods that could be sold separately, they can also correspond to features as well. To take the examples discussed in Parts III, IV, and V below, a cold/sinus tablet containing a pain reliever and a decongestant is the combination of two goods that can be (and are) sold separately. So is a package of four electrical adapters. Some of the automobile options we consider, such as an automobile sound system, can be purchased separately. As far as we know, however, there is no market to get electronic locks installed on cars that come without them. Thus, much of what we label as tying in that case concerns "features" rather than goods. This distinction might conceivably be important for determining whether a tie is illegal, but it does not affect the underlying economic principles. Consider, for example, the distinction between first class and coach airline service. The former typically involves a larger seat, a better meal, and free alcoholic beverages. All are included in the premium for a first class ticket. One cannot buy the larger seat and forego the cost of the drinks. Whether or not the better meal and drinks are labeled "features" or "products," the model captures the essence of the situation. Some people who want the additional room would also choose to pay extra for a better meal and alcohol, but others would not; and the airline does not give them the choice.

80 While we focus on two goods and three types of customers, the model could be generalized to any number of products and demand groups.

81 Customers of each type are willing to pay much more for the good they want than what they might have to pay in the market to obtain it. This treatment assumes perfectly inelastic demand within groups and no mobility between groups. This stylized treatment of demand greatly simplifies the exposition (particularly of the numerical examples). Accounting for demand elasticity within groups has no substantive impact on the results. *See* Evans & Salinger, *supra* note 68.

The assumption that markets are contestable implies that prices equal average cost. Table 2 shows the average cost (and, therefore, the price in a contestable market) of each product given the entire set of product offerings.[82]

Table 2. Offerings and Prices

Available Goods	*Outcome*	*Price* 1	2	B
All	Mixed Bundling	$c_1 + \frac{F}{X_1}$	$c_2 + \frac{F}{X_2}$	$c_B + \frac{F}{X_B}$
1 and *2*	Components	$c_1 + \frac{F}{X_1 + X_B}$	$c_2 + \frac{F}{X_2 + X_B}$	
Bundle only	Pure Bundling			$c_B + \frac{F}{X_1 + X_2 + X_B}$
Bundle and Good *1*	Good *1* tied to Good *2*	$c_1 + \frac{F}{X_1}$		$c_B + \frac{F}{X_2 + X_B}$
Bundle and Good *2*	Good *2* tied to Good *1*		$c_2 + \frac{F}{X_2}$	$c_B + \frac{F}{X_1 + X_B}$

We now turn to some hypothetical numerical examples that illustrate the different possible outcomes in our model and how they depend on the underlying parameter values. In our first example, our assumptions about demand and costs give rise to mixed bundling. We focus on this case in some detail in order to make clear the meaning of the sustainability condition. We then describe how a change in each parameter would cause the sustainable outcome to change. We then consider three additional examples that illustrate particularly interesting possibilities.

Table 3 contains our first example. The size of each group of consumers is 100. The marginal costs of both goods *1* and *2* are 8 while the marginal cost of the bundle is 14. Since the latter is less than the sum of the components' prices, there are marginal cost savings from bundling. Fixed costs are 600.[83] It

82 The average cost of a product depends on the quantity purchased, which in turn depends on what other produets are offered.

83 Even though we assume in these examples that the fixed cost of each produet offering is the same, we list the size of the fixed cost for each offering to emphasize that they could be different in a more general model.

follows that the prices of the components under mixed bundling are 14 while the price of the bundle is 20.[84] As the next line in the Table indicates, the price of the bundle under pure bundling is 16.[85] It is lower than the price of the bundle under mixed bundling because more customers share the fixed cost. Under components selling, the prices of the components are 11 each.[86] As with pure bundling, the prices are lower than under mixed bundling because the fixed costs are shared with a larger group.[87]

Table 3. An Example of Mixed Bundling

	Good		
	1	*2*	Bundle
Assumed Values			
Demand (X)	100	100	100
Marginal Cost (c)	8	8	14
Fixed Cost (F)	600	600	600
Prices			
Mixed Bundling	14	14	20
Pure Bundling			16
Components	11	11	
Bundle and Good *1*	14		17
Bundle and Good *2*		14	17

Before turning to why mixed bundling is sustainable, let us consider why the other product configurations are not.[88] Under pure bundling, the price of the

84 The calculations are 8 + 600/100 = 14 for the component price and 14 + 600/100 = 20 for the bundle price.

85 The calculation is 14 + 600/(100 + 100 + 100) = 16.

86 The calculation is 8 + 600/(100 + 100) = 11.

87 To complete the table, the price of good *1* when good *1* and the bundle are offered is 8 + 600/100 = 14. The price of the bundle in that case is 14 + 600/(100 + 100) = 17. The calculations when good *2* and the bundle are offered are comparable.

88 We noted above that the bundling efficiencies could be convenience realized by consumers rather than cost savings for firms. Such convenience would be reflected in a willingness to pay a premium for the bundle rather than both components separately and would therefore affect the sustainability conditions. In Table 3, for example, one of the sustainability conditions for mixed bundling is that the price of the bundle under mixed bundling (20 in Table 3) be less than the sum of the prices of the components under components selling (11 + 11 = 22 in Table 3). If, however, consumers who want both components strictly preferred to buy them in bundled form and were willing to pay, say, a 2.50 premium to do so, then the bundle price could be as high as 24.50 (computed as 22 + 2.50) for the condition to hold. Similarly, customers who want just one component might strictly prefer *not* to get the other. (That is, our implicit assumption of free disposal might not apply.) The model can also handle this twist with a modification of the sustainability conditions. For example, with free disposal, the price of good *1* under mixed bundling (14 in Table 3) must be less than what the price of the bundle would be if only the bundle and good *2* were offered (17 in Table 3). If, however,

bundle is 16. This price is susceptible to entry by, say, a producer of good *1* at a price of 14.[89] This component price is less than the 16 that group *1* pays for the bundle under mixed bundling, and it is sufficient to cover costs even if only group *1* buys the bundle. Pure components selling, in which the price of each of the two goods is 11, is not sustainable either. Group *B* pays a total of 22 for the two components, so entry with the bundle at a price of 20 attracts group *B* and is profitable. When the bundle and just good *1* are offered, the price of the bundle is 17. Entry by a supplier of good *2* at a price of 11 is then profitable. For the same reason, it is not sustainable to offer just the bundle and good *2*.

Having seen how entry can prevent a set of offerings from being sustainable, we can now understand why mixed bundling is sustainable in this case. All possible products are offered in mixed bundling, so it is not possible to enter with a new product. We do, however, need to consider whether cutting the price of an existing product (or products) to attract an additional block of customers would be profitable. At these prices, it is not. For example, to sell the bundle at a price that is low enough to attract groups *1* and *2*, one would still have to charge 16.[90] But that would not be low enough to attract groups *1* and *2*, which can purchase only the good they want under mixed bundling for 14. Similarly, cutting the price of the components to attract group *B* would not be profitable. If group *B* purchased the components, the prices would still have to be 11. Group *B* would then pay 22 for both goods, which is more than the 20 it pays for the bundle under mixed bundling.

There are a number of factors that give rise to mixed bundling in this example. First, there are marginal cost savings from bundling. At the same time, the marginal cost of the bundle exceeds the marginal cost of just one of the components. So, putting fixed costs aside, there would be an advantage to having the separate components available to those who want just one of them. Also, the demand for each of the three possible products is substantial; and, while fixed costs are present, they are not so great as to preclude offering one of the goods.

The results in Table 3 depend, of course, on the assumed values for each of the seven variables in the model.[91] Small changes in each variable would affect prices, but mixed bundling would still be the qualitative outcome. With larger changes, however, the qualitative outcome would change as well. Since mixed bundling means that all three of the possible products are offered, any change would eliminate one or more of the products offered.

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those who want just good *1* would be willing to pay 1 more to buy it separately rather than as part of a bundle, then the condition becomes that the price of good *1* cannot be more than 18, not 17.

89 It is susceptible to entry by good *2* as well.

90 As Table 3 indicates, that is the price of the bundle under pure bundling.

91 The seven parameters are: the number of people who want good *1* (X_1), the number of people who want good *2* (X_2), the number of people who want both goods (X_B), the marginal cost of good *1* (c_1), the marginal cost of good *2* (c_2), the marginal cost of the bundle (c_B), and the fixed cost of an offering (F).

For example, consider a reduction in the number of people who want just good *1*. The fixed cost of offering good *1* would then have to be spread over a smaller customer base so the price of good *1* would have to increase. When the number of people who want only good *1* is sufficiently small, the price of good *1* would exceed the price of the bundle.[92] Consumers who want just good *1* would then buy the bundle (and discard good *2*). Good *1* would disappear from the market, leaving good *2* and the bundle as the only products offered. In that case, good *2* is tied to good *1*.

Just as a reduction in the number of people who want good *1* causes the price of good *1* to go up, an increase in X_1 causes the price to drop. With a sufficiently large increase in the demand for good *1* alone, the price can drop enough that people who want both goods find it cheaper to buy them separately.[93] The bundle disappears from the market. The result is pure components selling, which does not entail tying.

Table 4 shows the change in product offerings that could result from sufficiently large increases and decreases of each of the seven variables in the model. (As we note, in some cases, even a large change will not alter the product offerings.) The first row of the table reports the results described above. The left half of that row says that with a sufficiently large decrease in X_1, the set of products offered becomes the bundle and good *2* while good *1* is no longer offered. The right hand half of the first row shows that with a sufficiently large increase in the demand for good *1*, the set of products offered are goods *1* and *2* while the bundle is no longer offered.

As Table 4 indicates, there are two cases in which mixed bundling is the qualitative outcome no matter how much the variable changes (in the given direction). One of these is a reduction in fixed costs. That result makes intuitive sense. Fixed costs in the model can cause a potential product not to be offered. Given the other assumed values in Table 4, fixed costs of 600 are low enough that all three of the possible products can be offered profitably. A reduction in the fixed cost of a product offering would only reinforce the

92 Holding the other values in Table 3 constant, mixed bundling is sustainable when demand for good *1* alone is 62 but not when it is 61. When $X_1 = 61$, the price of good *1* would have to be $8 + 600/61 = 17.83$. It might seem surprising at first that the people who want good *1* would not buy it at that price, since it is less than 20, the price of the bundle under mixed bundling. However, if the bundle is priced to attract those who want just good *1* as well as those who want both goods, then it can be offered at a price of $14 + 600/(100 + 61) = 17.73$.

93 For consumers who want both goods to buy them separately, the sum of the prices of the separate goods must drop below 20, which is the price of the bundle under mixed bundling. One might suspect that this could not happen since the price of good *2* under mixed bundling is 14 and the price of good *1* cannot drop below the marginal cost of 8. However, if good *2* is sold to the group that wants both goods as well as the group that wants just good *2*, the fixed cost is spread over a larger group and the price of good *2* can be lowered to 11. Provided the number of people who want just good *1* is large enough so that the price can be lowered below 9, then the bundle can no longer be offered profitably. This happens when 501 people want just good *1*. (In that case, total demand for good *1*—including the 100 customers who want both goods—is 601, and the price of good *1* is $8 + 600/601 = 8.998$.)

possibility of providing for each group the product tailored to its particular demand.

Table 4. Possible Change in Product Offering Due to Large Changes in Assumed Values

	Parameter Decreases		Parameter Increases	
Parameter	*Offered*	*Not Offered*	*Offered*	*Not Offered*
X_1	Bundle and Good *2*	Good *1*	Goods *1* and *2*	Bundle
X_2	Bundle and Good *1*	Good *2*	Goods *1* and *2*	Bundle
X_B	Goods *1* and *2*	Bundle	Goods *1* and *2*, Bundle	None
c_1	Goods *1* and *2*	Bundle	Bundle, Good *2*	Good *1*
c_2	Goods *1* and *2*	Bundle	Bundle, Good *1*	Good *2*
c_B	Bundle	Goods *1* and *2*	Goods *1* and *2*	Bundle
F	Bundle, Goods *1* and *2*	None	Bundle	Goods *1* and *2*

Note: Each row shows the set of products offered when the value of a variable assumed in Table 3 changes enough to change the set of product offerings. The left half represents decreases in the variables while the right half represents increases. In turn, each half has two cells, one showing the product(s) that continue to be offered and one showing the product(s) not offered.

When X_B increases, there is still no change to the set of product offerings. To understand that result, consider Table 3. The prices of goods *1* and *2* are 14, which is also the marginal cost of the bundle. No matter how big X_B gets, the price of the bundle cannot fall below 14, so the separate components continue to be offered for any possible increase in X_B. This result is not completely general. If c_B were only 13, then a sufficiently large increase in X_B

could make it possible to offer the bundle for a price below 14, in which case pure bundling would result.[94]

Table 5. An Example of Pure Bundling Due To High Fixed Costs

	Good 1	Good 2	Bundle
Assumed Values			
Demand (X)	100	100	0
Marginal Cost (c)	8	8	16
Fixed Cost (F)	1800	1800	1800
Prices			
Mixed Bundling	26	26	∞
Pure Bundling			25
Components	26	26	
Bundle and Good *1*	26		34
Bundle and Good *2*		26	34

The right half of the last row, which reports the effects of increases in F, is of particular interest. Not surprisingly, a higher fixed cost of a product offering reduces the number of products offered. Most interesting though is that if F increases enough it results in pure bundling. This result depends in part on the precise values underlying Table 3. There are other parameter values for which some increase in F would make it unprofitable to offer the bundle and still others when an increase in F would make just one of the components unprofitable.[95]

Even when moderate increases in F do not cause pure bundling, sufficiently large increases in F do. Indeed, this is the case even when no one wants both goods ($X_B = 0$) and there are no marginal cost savings ($c_B = c_1 + c_2$). The case reported in Table 5 illustrates the point. All but three of the parameters are the same as in the first example—the exceptions are that $X_B = 0$, $c_B = 16 = c_1 + c_2$, and $F = 1800$. By themselves, the first two assumptions would result in components selling. With no one demanding both goods and no marginal cost savings, there would appear to be no reason for the bundle to exist. Indeed, there is no reason for the bundle to exist *in addition to* the

94 Since there are seven variables whose effects interact, it would take a large number of tables to provide a complete representation of the model's comparative statics. Readers interested in a more complete and formal exposition of the model should consult Evans & Salinger, *supra* note 68.

95 It is easy to find values for each case that give rise to each possibility. For example, when the number of people who demand just good *1* is relatively small, then an increase in F can make it unprofitable to offer good *1*. Similarly, if the number of people who demand both goods is relatively small, then an increase in F can make it unprofitable to offer the bundle.

separate components. With sufficiently high fixed costs, however, the bundle can be offered *instead* of the two components. The advantage of the bundle is that it meets the needs of both groups (X_1 and X_2) with a single product offering and a single fixed cost. With sufficiently high fixed costs, the fixed cost savings outweigh the "wasted" marginal cost in providing each customer with a component he does not want.

Table 6. An Example of Pure Bundling Due To Insufficient Demand for Components

	Good		
	1	*2*	Bundle
Assumed Values			
Demand (X)	50	50	100
Marginal Cost (c)	8	8	14
Fixed Cost (F)	600	600	600
Prices			
Mixed Bundling	20	20	20
Pure Bundling			17
Components	12	12	
Bundle and Good *1*	20		18
Bundle and Good *2*		20	18

Table 6 provides another set of parameters under which pure bundling is the only sustainable outcome. The rationale for pure bundling is, however, fundamentally different from the one in Table 5. The parameters are similar to the first example in Table 3 except that X_1 and X_2, which are the demands for the individual components, are 50 instead of 100. Here, pure bundling arises because many customers want both components and demand for the separate components is too low to justify offering them. (Note, however, that the demand is not so low as to be trivial.)

Thus far we have stressed which offerings are sustainable. It is natural to ask whether the sustainable outcomes are efficient. Consider Table 7, in which we have changed two parameters from the base case. The marginal cost of the bundle is now 16, so there are no marginal cost savings from bundling, but the size of the group that wants the bundle is 200, so a larger fraction of customers wants the bundle. Without any marginal cost savings from bundling, mixed bundling is inefficient from a social standpoint relative to components selling. It simply generates an additional fixed cost. Yet, mixed bundling is the only sustainable outcome. The price of the bundle under mixed bundling is 19, which is less than the sum of the prices of the components under component selling.

Table 7. An Example in Which Mixed Bundling Is Inefficient

	Good 1	Good 2	Bundle
Assumed Values			
Demand (X)	100	100	200
Marginal Cost (c)	8	8	16
Fixed Cost (F)	600	600	600
Prices			
Mixed Bundling	14	14	19
Pure Bundling			17.5
Components	10	10	
Bundle and Good *1*	14		18
Bundle and Good *2*		14	18

To see why mixed bundling arises in this example, consider the total expenditures of group B under components selling. It purchases both components for a price of 10 each. That price consists of a marginal cost of 8 and an average fixed cost of 2. Since members of this group buy both goods, each one's total expenditure consists of 16 in marginal costs and 4 in average fixed costs. With the bundle, the price they pay still reflects a marginal cost of 16, but their share of the fixed cost is only 3. Thus, the bundle offers private savings to group B, which now only has to share in one fixed cost. The private savings to group B is not, however, a social savings. Rather, the additional fixed cost is a social cost.

This last example has three important implications.

First, the market outcome is not necessarily efficient, in the sense that a social planner with full information and no costs of imposing a solution could do better. That should not be surprising in light of the results in the product selection literature that the set of product offerings is not necessarily efficient.[96]

Second, while the model reveals a bias toward the offering of a bundle, the bias is primarily toward mixed bundling, not toward pure bundling or other forms of tying. Indeed, although the preceding example does not show it, the model can be interpreted to suggest a bias *against* pure bundling. In a companion paper, we show that the conditions for pure bundling to be the only sustainable outcome are stronger than the conditions for pure bundling to be the efficient outcome.[97] The model does not rule out the possibility of inefficient

96 *See* Carlton & Waldman, *supra* note 5; Whinston, *supra* note 5.

97 *See* Evans & Salinger, *supra* note 68.

tying. Tying can be the predicted outcome when components selling is optimal, but there is no systematic reason for this to be the case. There is a tendency in the model for big groups to get the offering they want. But this effect holds equally when the biggest group wants just one component as when the biggest group wants the bundle.

Third, in analyzing the welfare consequences of bundling discounts (under mixed bundling), it is important to distinguish between marginal cost savings and the effect of fixed costs. Both are potential sources of savings to the group that purchases the bundle, but only the marginal cost savings reflect welfare gains. In this example, there is a substantial bundle discount; the bundle price of 19 is 5 less than the sum of the components' prices. Under pure components selling, they would pay a total of 20, which is also more than the bundle price under mixed bundling. Notwithstanding this private benefit, it is inefficient for the bundle to be offered. In contrast, if there were no fixed costs and the bundle discount reflected a marginal cost savings of 5, then mixed bundling would be efficient.

C. *Insights from Cost-Based Theory*

The principal insight from the model is that competitive firms can eliminate certain configurations of products for two roughly equivalent reasons. First, they eliminate a choice because it saves costs, resulting in lower prices for the other configurations. For example, firms may prefer lowering prices for components to offering a bundle. Second, they eliminate choice because it is not profitable to offer that choice to the group of consumers who want that choice. For example, firms may not find it profitable to offer the bundle because there are not enough customers who value the bundle to cover the fixed costs of offering it.

Tying, in particular, results when there are fixed costs of offering a product separately and there are not enough consumers who want that product separately. The pure bundling case highlighted how tying comes to be—significant fixed costs make it cheaper to sell everyone a bundle even if they do not want one or more component; and low demand for the separate goods makes it difficult to cover even modest fixed costs of product offerings.

In the next three Parts we will explore how costs and demand give rise to different product offerings in several industries. Over-the-counter cold remedies and pain relievers provide an example of mixed bundling. Many consumers want these drugs separately while many others want them combined. Foreign electrical plug adapters provide an example of pure bundling. Most consumers do not want all of the adapters that come in a typical package. Finally, we consider mid-sized automobiles and contrast the option strategies that different manufacturers have taken. We document that over time, Ford's offerings of optional equipment have moved from mixed bundling to nearly pure bundling. In restricting the set of option combinations to those for which there is

substantial demand, Ford adopted a new strategy that resembles the longer-standing practices of its Japanese rivals Honda and Toyota. Ford's shift in strategy may reflect a recognition that there are fixed costs of offering many options.

III. Over-the-Counter Cold Remedies and Pain Relievers

Any visitor to the cold remedies aisle at a drug store in the United States sees a bewildering array of concoctions. Remedies vary by daytime or nighttime, dose, combination of ingredients, and type of pill. The cough and cold remedies market segment has been called the most competitive over-the-counter drug category in North America.[98] Pharmaceutical firms have competed by creating line extensions throughout the cough and cold segment, blurring the borders between formerly well-defined segments.[99] Some of the products available are combinations of products available separately. As we document, the price of these combinations is substantially less than the sum of the prices of buying the component drugs separately.

A. Background

Someone who has a cold (but not a cough) and would like a remedy to help get through the day typically has two needs: a decongestant (to relieve stuffiness) and a pain reliever (to relieve headaches). Someone who has a headache but no congestion does not need a decongestant; someone who has congestion but no headache has no need for a pain reliever—there are thus distinct demand groups for each of the components. We focus on a small number of examples of pain relievers, decongestants, and combinations that involve the two. The pain relievers have acetaminophen as the active ingredient (e.g., Tylenol pain reliever) while the decongestants have pseudoephedrine hydrochloride as the active ingredient (e.g., Sudafed decongestant).

Acetaminophen is a widely used pain reliever which has been used medically since 1893 but which did not gain popularity in the United States until the 1950s. The FDA approved Extra Strength Tylenol for over-the-counter use in July 1975 although the regular dose had been available since 1955. There are no secrets to the chemical structure or manufacture of acetaminophen. At least 145 firms produce branded or generic versions of drugs for which acetaminophen is an active ingredient.[100] Tylenol is the best-known brand as a result of early entry and extensive advertising and promotion. Drug

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98 Mick Maroney, *North America's OTC Cough Cold Market*, PHARMA MARKETLETTER, Mar. 9, 1992.

99 *Id.*

100 Food & Drug Admin., National Drug Code Database, *at* http://www.fda.gov/cder/ndc/database/faq.htm (last visited Nov. 23, 2004).

stores in the United States typically carry generic versions of acetaminophen; large chains such as CVS, Walgreens, and Rite-Aid have private-label generic versions. Drug store chains can contract with a number of firms to manufacture and package their private-label versions.[101] As a pain reliever, the various acetaminophen-based drugs compete with numerous other remedies, including other off-patent, over-the-counter pain relievers like aspirin (Bayer being a leading brand), ibuprofen (Advil and Motrin[102] being leading brands), and naproxen sodium (Aleve[103] being a leading brand). Combination pain relievers also exist: Excedrin (and private-label copies) typically consists of aspirin, acetaminophen, and caffeine. Analgesics appear to be highly competitive.[104]

Pseudoephedrine hydrochloride is a widely used decongestant. It has been approved for over-the-counter use since 1976.[105] There are no secrets in its chemical structure or manufacture. At least 155 firms now produce branded or generic versions of drugs for which it is an active ingredient.[106] Although Sudafed is the best-known brand, drug stores in the United States also carry private-label versions. As with acetaminophen, drug store chains can contract with a number of firms to manufacture and package the drug.[107] Pseudoephedrine hydrochloride appears to be the most widely used decongestant in pill form in the United States.[108] Nasal sprays sometimes use other compounds (e.g., oxymetazoline and phenylephrine). One side effect of pseudoephedrine hydrochloride is that it can act as a stimulant, interfering with sleep.[109] It therefore is typically not used in "nighttime" dosages unless

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101 Leiner Health Products, Inc. manufactured acetaminophen for customers such as Wal-Mart, Costco, Target, and Safeway as of November, 2001. Pharmaceutical Formulations, Inc., manufactured acetaminophen for companies such as Kmart, Eckerd, and Duane Read. FED. TRADE COMM'N, *Analysis of Proposed Consent Order to Aid Public Comment*, *at* http://www.ftc.gov/os/2001/11/leineranalysis.htm *and* http://www.ftc.gov/os/2001/11/phformulationsanalysis.htm (last visited Feb. 13, 2004).

102 Motrin, like Tylenol, is a brand owned by McNeil. So is the St. Joseph brand of low-dosage aspirin. Press Release, Johnson & Johnson Company, McNeil Acquires St. Joseph Business from Schering-Plough Healthcare Products (Dec. 19, 2000), http://www.jnj.com/news/jnj_news/20020307_1406.htm (last visited Nov. 23, 2004).

103 Aleve is a brand owned by Bayer. BAYER HEALTHCARE AG, Products, *at* http://www.bayerhealthcare.com/index.php?id=25&L=2&countryID=35&divisionID=3 (last visited Nov. 23, 2004).

104 *Intense Competition Under Way in Arena (Analgesics)*, CHAIN DRUG REVIEW, Aug. 15, 1994.

105 Consumer Healthcare Products Ass'n, Ingredients & Dosages Transferred From Rx-to-OTC Status (or New OTC Approvals) by the Food and Drug Administration Since 1975 (July 3, 2003), *available at* http://www.chpa-info.org/web/advocacy/general_issues/Switch/switch_list.pdf (last visited Nov. 22, 2004).

106 Food & Drug Admin., *supra* note 100.

107 *See, e.g.*, Pharmaceutical Formulations Inc., Frequently Asked Questions, *at* http://www.pfiotc.com/index.htm (last viewed Nov. 11, 2004).

108 *See* Am. Health Ass'n, Cardiology Patient Page, *at* http://circ.ahajournals.org/cgi/content/full/107/24/e215 (last visited February 13, 2004).

109 Note that consumers are not allowed to purchase pseudoephedrine hydrochloride in large quantities, since it can be used to manufacture methamphetamine ("speed"). *See* Diversion Control Program, U.S. Dep't of Justice, *Methamphetamine Anti-Proliferation Act of 2000 (MAPA)*—

accompanied by other drugs (such as older antihistamines) that cause drowsiness. The provision of pseudoephedrine hydrochloride appears to be highly competitive.

Many combination cold remedies are available. From the CVS web site, products that combine only acetaminophen and pseudoephedrine hydrochloride are available under the Tylenol, Sudafed, and CVS brand names. Similar combination products that use ibuprofen instead of acetaminophen are available under the Advil, Motrin, and CVS brand names. And other combination products that use naproxen sodium instead of acetaminophen are available under the Aleve brand name.

B. *Branded and Private-Label Cold Remedies*

We collected data on cold remedies sold at a Walgreens pharmacy in downtown Chicago as well as on web sites operated by the CVS and Walgreens chains. Both pharmacies sell private-labels that enable customers to buy pain relievers and decongestants separately or together. They also sell the branded drugs. Tylenol is available by itself or bundled with a generic decongestant; Sudafed is available by itself or bundled with a generic pain reliever.

The variations available are extensive. The CVS web site lists the following numbers of alternatives, based on dosages, package sizes, delivery systems (caplets, tablets, liquids, etc.) and drug combinations:

- Twenty-two products under the Sudafed brand name, all containing pseudoephedrine hydrochloride;[110]
- Over fifty products under the Tylenol brand name, all containing acetaminophen;[111]
- At least twenty-eight CVS-brand products containing pseudoephedrine hydrochloride;[112]
- Over fifty CVS-brand products containing acetaminophen.[113]

Frequently Asked Questions, *at* http://www.deadiversion.usdoj.gov/chem_prog/faqs/mapa_faq.htm (last visited Nov. 23, 2004).

110 A product search of http://www.cvs.com for the term "Sudafed" on Feb. 13, 2004, returned twenty-two hits. A similar search of http://www.walgreens.com returned twenty hits.

111 A product search of http://www.cvs.com for the term "Tylenol" on Feb. 13, 2004, returned over fifty hits, the apparent reporting limit of the search engine for the site. Using that and other searches, which are probably not comprehensive, we have been able to identify at least fifty-eight Tylenol products on the site. The Walgreens web site lists ninety Tylenol products.

112 A product search of http://www.cvs.com for the terms "CVS" and "pseudoephedrine hydrochloride" on Feb. 13, 2004, returned twenty-eight hits.

113 A product search of http://www.cvs.com for the terms "CVS" and "acetaminophen" on Feb. 13, 2004, returned over fifty hits, the apparent reporting limit of the search engine for the site. Using that and other searches, which are probably not comprehensive, we have been able to identify at least sixty-one CVS-brand products containing acetaminophen.

Table 8. Prices for 24 Tablet/Caplet Packages

Brand	Combination	Pseudoephedrine HCl Only	Acetaminophen Only
Tylenol	$5.99	NA	$3.99
Sudafed	$5.99	$4.59	NA
CVS	$3.99	$3.49	$2.99

Notes:

- Tylenol: "Tylenol Sinus Caplet" (the combination product) and "Tylenol Extra Strength Caplets."
- Sudafed: "Sudafed Sinus and Headache Caplet" (the combination product) and "Sudafed Sinus & Cold."
- CVS: "Non-Aspirin Sinus Caplets Maximum Strength" (the combination product), "Nasal Decongestant Tablets Maximum Strength," and "Non-Aspirin Caplets Extra Strength." NA denotes a combination that was not offered.
- Doses are 30mg of pseudoephedrine HCl and 500mg of acetaminophen.

Source: The CVS web site, http://www.cvs.com, Feb. 11, 2004.

Table 8 summarizes some of the price data we found for the combinations. The CVS brands for acetaminophen, pseudoephedrine hydrochloride, and their combination have substantially lower prices than the better-known brands, roughly 25-35% less.[114] More interestingly, there are substantial discounts for buying a bundle. A customer who buys separate packages of pain relievers and decongestants pays $6.48 ($3.49 for the pseudoephedrine hydrochloride and $2.99 for the acetaminophen) for a package of twenty-four CVS private label tablets. A customer pays $3.99 for a package of twenty-four CVS private label tablets that have the same dosage as the two separate packages. CVS therefore charges 38% less for the combination product than it does for the two separate products. Put another way, the incremental price of getting acetaminophen in combination with CVS pseudoephedrine is only $0.50, which is approximately 17% of the price of purchasing the same quantity of CVS acetaminophen separately. The manufacturers of Tylenol and Sudafed do not sell generic versions of each other's main product separately—there is no Tylenol pure pseudoephedrine product and no Sudafed pure acetaminophen product.[115] But a customer who bought Tylenol and Sudafed

114 This is a well-known phenomenon in pharmaceutical pricing. *See Q&A Brian Sharoff, PLMA*, DRUG STORE NEWS, Nov. 5, 2001, *available at* http://www.findarticles.com/cf_dls/m3374/16_23/79868899/p1/article.jhtml (last visited Feb. 25, 2004); *see also* Patricia Winters, *Private-Label Health Aids Ease Competitive Pain; Food Stores See Profitable Remedy with Trend*, ADVERTISING AGE, May 10, 1993; WellPoint Pharmacy Management, *Drug Information Center - Generic Drugs, at* https://www.healthenvelope.com/healthenvelope/page/drug_generic (last visited Feb. 25, 2004).

115 The CVS branded products shown in Table 8 show mixed bundling: consumers can purchase either component separately, or they can purchase the combination product. In contrast, the Tylenol products that are available technically reflect "tying": consumers can buy either the pain

separately would pay $8.58 compared with $5.99 for the combination; the combination therefore costs about 30% less than the separate products.

C. *Explanations for the Bundled Discount*

The most striking empirical finding from this case is that the bundle discount is so large. If one presumes that the primary motive for mixed bundling is price discrimination, this case might initially seem to provide supporting evidence. But the cost-based theory provides a quite simple explanation not only for why the bundle is offered at a discount, but also for why the discount is so substantial. The costs of the active ingredients are a small portion of the total price of these products. For example acetaminophen costs approximately $8 per kilogram, which corresponds to 0.4 cents for a 500 mg tablet or 9.6 cents for twenty-four tablets.[116] As a result, we should expect the cost of producing a package of tablets of decongestant and acetaminophen to be only slightly above the cost of producing a package of tablets with just decongestant.

Like any model, ours is just an approximation. To the extent that the prices are not exactly equal to costs, some price discrimination might be at play as well. But we doubt that models of price discrimination can provide as compelling an explanation for the size of the bundle discount as our cost model. To begin with, price discrimination in the absence of cost savings might imply a premium for the bundled product rather than a discount. The combination products provide convenience not only because someone suffering from a sinus headache might prefer to take half as many pills, but also because the labeling saves him the trouble of determining which active ingredients will relieve his symptoms. Even if price discrimination does qualitatively imply a bundle discount, demand for the bundled products would have to be much more elastic than demand for the unbundled products for price discrimination to be the sole explanation for the size of the discount we observe. Without measuring the elasticities directly, we cannot rule that out, but there is no compelling reason to expect such large differences.[117]

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reliever or the combination product, but they cannot purchase a Tylenol-branded decongestant. But the "tying" in question here is inconsistent with the monopoly leverage/foreclosure theories that underlay the current application of tying law: the "tying" product for Tylenol in this case would be the decongestant, and the "tied" product would be the pain reliever. That is, the "tying" product for the Tylenol brand is one for which Sudafed (not Tylenol) arguably has some market power. A corresponding issue arises with the Sudafed branded products in question: the "tying" product for the Sudafed brand is one for which Tylenol (not Sudafed) arguably has some market power.

116 Mark Kirschner, *Acetaminophen (Chemical Profile)*, CHEMICAL MARKET REP., Aug. 11, 2003.

117 Strategic explanations do not seem believable either. CVS (and the other drug store chains) engage in mixed bundling, not tying, so tying-related foreclosure stories are not applicable. Moreover, there is no reason to believe that CVS has appreciable market power in any of the component products or in the combination products. As a result, the foreclosure explanation is irrelevant for them. Tylenol and Sudafed are the leading brands in their narrow product categories,

Even under our cost-based model, a large bundle discount by itself does not necessarily imply that mixed bundling is the optimal outcome. Based on the first line of Table 2, the bundle discount implied by the model under mixed bundling (D) is:

$$D = c_1 + \frac{F}{X_1} + c_2 + \frac{F}{X_2} - c_B - \frac{F}{X_B}$$
$$= \left(c_1 + c_2 - c_B\right) + \left(\frac{F}{X_1} + \frac{F}{X_2} - \frac{F}{X_B}\right)$$

The first set of parentheses represents marginal cost savings from bundling while the second set reflects fixed cost savings. As we illustrated with the example in Table 7, the private benefit consumers get from marginal cost savings is also social savings. The private benefit that a consumer gets from making a smaller contribution to fixed costs is not.

In this particular case, however, there is good reason to believe that marginal cost savings are significant. As noted above, the active ingredients in these medications represent a very small portion of the total price. Putting the active ingredients into dosage form and then packaging the tablets likely represents a much larger portion of costs. It is precisely these cost components that are the source of marginal cost savings. The bundled product requires one package rather than two and the production of half as many tablets.

Product-specific fixed costs are present in this case. For example, each separate product in a retail environment occupies a shelf slot, so a retailer may have to devote additional space to offer both the bundled products and the separate components. However, the proliferation of products that we observe suggests that these product-specific fixed costs are not large.[118]

We now turn to a case in which product-specific fixed costs do give rise to tying.

IV. Foreign Electrical Adapters

Tying does occur in the case of foreign electrical adapters. In this case most customers are forced to buy a product that they do not want. The most

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and they do engage in "tying" with their combination cold remedies. But their "tying" is backwards: their leading brand components are available separately from their combination products.

118 In a companion paper, we provide rough decomposition of the bundle discount into marginal cost and fixed cost effects. We estimate that the bundled product does lower costs (in addition to any convenience it provides). *See* David S. Evans & Michael Salinger, *An Empirical Analysis of Bundling and Tying: Over-the-Counter Pain Relief and Cold Medicines* (CESifo Working Paper 1297, Oct. 2004), *available at* http://www.cesifo.de/pls/guestci/download/CESifo+Working+Papers+2004/CESifo+Working+Papers+October+2004/cesifo1_wp1297.pdf.

plausible explanation, given that this is a highly competitive market with low barriers to entry, is that there are product-specific scale economies (here from packaging and shelf space) and that bundling several adapters together satisfies "most customers" at the lowest cost. This case has another lesson: the explanation here is compelling mainly because competition rules out other explanations; but with significant market power it may be hard to distinguish efficiency from less innocent theories.

A. *Background*

Foreign adapters enable travelers to use electrical appliances for one country in other countries that have a different plug standard. There are about thirteen plug standards worldwide. We focus on the sale of these adapters at RadioShack,[119] a company that operates approximately 7,000 retail electronic stores in the United States.[120] Many of the items it sells are available at many other stores such as electronics super stores (e.g., Best Buy) or more general-purpose retailers (e.g., Sears), computer stores, and others. The typical RadioShack store is smaller than these other outlets.[121] RadioShack aims to stock hard-to-find electronics parts[122] to offer customers assistance in identifying the part they need,[123] and to have convenient locations.[124]

At its retail stores, RadioShack generally sells a package of four plug adapters for outlets that are used in Europe, the United Kingdom, New Zealand/Australia, and North America.[125] An American traveler needing plug adapters for an overseas trip would typically buy this package. RadioShack also sells an adapter for North America separately. This is what a visitor from Europe would buy if traveling to the United States. On May 8, 2002, the prices at the RadioShack store near the Boston University campus were $2.49 for the

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119 *See* RADIOSHACK CORP., 2002 FORM 10K 1 (Mar. 28, 2003), http://www.radioshackcorporation.com/ir/irfrm.html (last visited Nov. 11, 2004).

120 About 5,000 are company-owned stores and the remainder are franchises. *Id.* at 2.

121 The average size of a store is approximately 2,400 square feet. *Id.*

122 RADIOSHACK CORP., 2001 ANNUAL REPORT 4 (2002), http://media.corporate-ir.net/media_files/NYS/RSH/reports/rsh_041202_annual.pdf (last visited Nov. 23, 2004).

123 *Id.*

124 RadioShack claims that 94% of people in the United States live or work within five minutes of a RadioShack store. *See* RADIOSHACK CORP., *supra* note 122.

125 The "European" adapter has two round prongs. The "U.K." adapter has three flat prongs arranged roughly in an equilateral triangle with the main axis of one perpendicular to the main axes of the other two. The adapter for Australia and New Zealand has two flat prongs that are not parallel. All four of these adapters have "female" connections that can take either a two-pronged, polarized North American plug or a "European" plug. The "North American" adapter in the package seems to have two possible uses. First, it can be used to convert a European plug to fit a polarized (or non-polarized) North American outlet; second, it can be used to convert a polarized North American plug to fit an unpolarized North American outlet.

North American adapter and $9.99 for the package of four.[126] Both of these packages have a RadioShack brand.

RadioShack does sell separate adapters at its web site under the "Hybrinetics" brand name.[127] The stand-alone prices are $2.49 for the North American, Australia/New Zealand, and European adapters and $4.99 for the U.K. adapter (all prior to shipping).[128] Consequently, the price for the package at the store is about 20% less than the sum of the prices for the stand-alone packages sold separately at the web site: $9.99 versus $12.46.

The market for travel adapters is highly competitive. At least ten different manufacturers make products similar to the ones discussed here,[129] and there are low barriers to entry in this market. A consumer in Chicago could purchase travel adapters through many different retail channels including hardware stores such as Home Depot and Ace Hardware, electronics stores such as RadioShack and Best Buy, general discount retail stores such as Target, Internet shopping sites such as amazon.com, and miscellaneous specialty shops such as travel stores and airport gift and magazine shops.[130] Most of these stores operate in highly competitive markets.

B. *Explanations for Pricing and Tying*

Given the high degree of competition in the manufacture of foreign adapters, and the number of locations at which one can buy them, cost is the most plausible explanation for the packaging and pricing strategies we observe. The apparent discount for the package of four adapters relative to the sum of what the prices would be if they were sold separately is plausibly attributable to the same sort of efficiencies of packaging evident in the cold remedies case. However, the important feature of this case is not so much the pricing of the

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126 We do not suggest that this bundling is necessarily the norm for bricks-and-mortar stores and our argument in this case depends on factors that appear to be particularly relevant for RadioShack. We have seen both in practice. Internet-based stores provide a wide variety of adapters separately and in packages. *See, e.g.*, TravelOasis, International Wall Outlet Plug Adapters Guide, *at* http://traveloasis.com/elad.html (last visited Nov. 11, 2004).

127 RadioShack, http://www.radioshack.com (last visited Dec. 5, 2004). We have not purchased these Hybrinetics plug adapters, so we cannot compare their features with those of the RadioShack brand. Internet-based stores provide a wide variety of adapters separately and in packages. *See, e.g.*, International Wall Outlet Plug Adapters Guide, *supra* note 126.

128 Electrical adapters are available at a number of web sites, and the price of the U.K. adapter is generally higher than the price of the others. At the Transadapt web site, http://transadapt.com, the U.K. adapter was $4, and the other three were each $2. At the International Electrical Supplies web site, http://www.international-electrical-supplies.com, the price of the U.K. adapter was $3.98 while the price of the other three was $2.98.

129 These manufacturers show up at RadioShack, Adapters, *at* http://www.radioshack.com/category.asp?catalog%5Frame=CTLG%5F010%5F009%5F000&Page=1 (last visited Nov. 11, 2004), and MSN Shopping, Adapters, *at* http://www.eshop.msn.com/marketplace.aspx?pmpType=1&pcId=7914&catID=1565 (last visited Nov. 11, 2004).

130 Home Depot, Ace Hardware, and Best Buy stores in the Chicago area were contacted on Feb. 26, 2004.

bundle as the decision not to offer the adapters separately. RadioShack stores are small but stock approximately 3,000 items. Offering four or five adapter choices would take up valuable shelf space. That has to be weighed against the demand for each of these choices, the demand for other products, and the cost of expanding shelf space.

It is possible to construct a price-discrimination explanation for the bundling and pricing. But that would require that most customers value all (or at least most) of the components at more than marginal cost. The aim of price discrimination is to capture potential surplus, which is the difference between what customers are willing to pay for a good and the marginal cost of producing it. If, for example, customers who want the European adapter do not value the Australian/New Zealand adapter at more than the marginal cost of production, there is no consumer surplus to extract. We conjecture that most people who buy adapters need only one or two. This is seen most easily for the North American and Australia/New Zealand adapters which account for half of the package. Most U.S. residents buying adapters do not need the North American one. And few would need the Australian one either. In 2001, there were nearly 12 million trips to countries where one would use the European adapter, nearly 5 million to countries where one would use the U.K. adapter, and only 1.3 million to countries using the Australian/New Zealand adapter. If we take these numbers as rough estimates of the relative demand for the different adapters, it is clear that the vast majority of people who want the European or U.K. adapters have no use for the Australian adapter.[131]

Leveraging theories are similarly implausible. Under these theories, RadioShack would need to have significant market power over one of the adapters, and it would then try to use that monopoly to gain an advantage in the "markets" for others. To apply the theory, one would have to identify the adapter in which it had market power and determine how it was trying to monopolize one or more of the other adapter "markets." But there is no reason to suspect that RadioShack faces nascent competition in, say, the "market" for Australian adapters. In all likelihood, easy supply-side substitutability means that the different adapters do not constitute separate antitrust markets—someone who makes and sells any one adapter can easily make and sell any other.

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131 We collected travel statistics from Int'l Trade Admin., U.S. Dep't of Commerce, U.S. Resident Travel Abroad Historical Visitation – Outbound 1991 – 2001, *at* http://tinet.ita.doc.gov/view/f-2001-11-001/index.html?ti_cart_cookie=20030310.162541.14328 (last visited Dec. 5, 2001). We matched the countries with the necessary adapter from TravelOasis, International Wall Outlet Plug Adapters Guide, *at* http://traveloasis.com/elad.html (last visited Nov. 11, 2004). In principle, of course, suitably strange patterns of foreign travel could explain everything. For example, suppose that all travelers from the United States to relevant foreign countries make one trip to Australia or New Zealand, about four trips to the United Kingdom, and about nine trips to Europe. This would match the observed distribution of foreign travel, and it would match the adapters in the RadioShack package. In the real world, of course, the patterns of foreign travel have many fewer people visiting Australia and New Zealand than Europe.

Moreover, to the extent that its motive is strategic entry deterrence, RadioShack would seem to take a bigger risk of facilitating entry into the larger "market" for the European adapter.

C. *Implications of Foreign Adapter Bundling*

The most important feature of this case is that while the bundling discount provides some evidence of bundling efficiencies, any efficiencies are relatively modest and they are not the reason that tying occurs. Rather, it would appear most likely that the tying occurs because of the limitation on the number of distinct products that can be offered.

While the broad explanation for the tying in this case is clear, there are two features of the case that have important implications for tying doctrine. First, even if we think we understand the rationale for the general strategy, some of the details are puzzling. Given that RadioShack sells the North American adapter separately, why does it include that adapter in the package of four? Second, there are plausible alternative strategies that some customers would prefer. Indeed, simply eliminating the North American adapter from the bundle would seem to make many customers better off. The only parties who would be harmed would be those who wanted the North American adapter in conjunction with one of the foreign adapters, and the harm they would suffer would be to lose the relatively modest marginal cost savings. If courts judge the reasonableness of a tie based on whether there is evidence of substantial *marginal* cost savings and ignore the *fixed* costs of product offerings (in this case, shelf space and stocking costs), they may fail to detect the true efficiency reason that tying occurs.

V. Optional Equipment on Automobiles

For more than a century cars have often come with optional equipment. For instance, the 1906 Ford line of cars came with optional cowl lamps, bulb horn, and three-inch wheels.[132] Customers could choose a car with or without each piece of optional equipment. AM/FM radios were optional on cars sold in the 1950s. Two aspects of optional equipment on automobiles make it an interesting subject for us. First, this optional equipment has become standard over time. Consumers lose the choice of buying the car without the option. Mixed bundling gives way to tying. Most cars now come with AM/FM radios as standard equipment. Second, American and Japanese car manufacturers initially pursued different strategies with respect to how much flexibility they gave customers to select optional equipment. The Japanese companies pursued a strategy best characterized as pure bundling, whereas the American companies used mixed bundling. Over a period of apparently aggressive competition in the

132 JOHN GUNNELL, STANDARD CATALOG OF FORD 1903-2003, at 22 (3d ed. 2002).

industry, the American companies adopted a strategy that resembled that of their Japanese rivals. Thus, pure bundling emerged as the dominant strategy in a competitive process.

In this Part, we focus on three competing and popular mid-sized sedans[133]—the Ford Taurus, the Honda Accord, and the Toyota Camry[134]—to explore these phenomena. We collected data on the prices and optional equipment for these three models for 1986, 1990, and 2004.

We find that Honda and Toyota tended to bundle most features together during the entire time period.[135] They thereby offered a bundle that appealed to a broad range of customers, and they did not offer product configurations that appealed to narrower groups of customers. We also find that Taurus offered many product configurations in 1986 but moved closer to the Accord and Camry approach by 2004. Thus Taurus moved from mixed bundling towards pure bundling. We argue that pure bundling is efficient because it economizes on fixed costs while providing a product that appeals to a broad range of customers. More speculatively, it appears that, over the time period we considered, there was an increasing recognition that increased product variety raises production costs in real but elusive ways.

A. *Background*

Until the early 1970s, the United States automobile industry was considered a classic example of a tight oligopoly.[136] Four domestic firms accounted for virtually the entire market. In the 1970s, imports from Japanese and other foreign automobile manufacturers began to erode the shares held by the domestic companies. By 2003, the top three domestics makers saw their shares fall to 60%. Although the industry remained concentrated, with an Herfindahl-Hirschman index ("HHI") score of 2,350,[137] there have been rapid

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133 The phenomena we document here—the comparison between the Taurus on the one hand and the Accord and Camry on the other and the change in strategy with respect to the Taurus—are merely examples of more general phenomena with respect to how the strategy of United States car companies differed from those of their Japanese rivals and how they changed over time. We were surprised at how difficult it was to find published documentation of the trend. One exception is John K. Teahen & Ryan Moloney, *Ford Simplifies 2002 Mix*, AUTOMOTIVE NEWS, July 30, 2001, at 1.

134 The Camry and Taurus and, more recently, the Accord have come as station wagons. The Accord also comes as a coupe. We consider only the sedan versions. For their competitiveness with each other, see reviews such as *On the Road: Getting What You Pay For*, SAN ANTONIO EXPRESS-NEWS, Feb. 20, 2004, at 4.

135 Most cars are not made-to-order with options. Instead the manufacturers anticipate consumer demand and produce a number of different varieties including paint color. The automobile dealers can then add some options themselves. The dealers then try to match customer preferences by searching through the distribution system for a car. However, it is not necessarily possible to obtain cars with any permutation of the options offered.

136 Robert F. Lanzillotti, *The Automobile Industry*, *in* THE STRUCTURE OF AMERICAN INDUSTRY 274 (Walter Adams ed., 4th ed. 1971).

137 U.S. CENSUS BUREAU, CONCENTRATION RATIOS IN MANUFACTURING 16, http://www.census.gov/prod/ec97/m31s-cr.pdf (last visited Nov. 22, 2004). Under the Department of

shifts in market share and entry. Price has fallen significantly with increased competition: from 1986 to 2003 the real price of cars dropped by 27%.[138]

The mid-sized segment is particularly competitive. The Taurus and the Camry have vied over the years to be the highest selling cars in the United States, a distinction that the companies apparently value.[139] We believe that the product design decisions we describe below are mainly the result of competitive forces.

B. *Bundling and Pricing Over Time*

To document the differences in tying strategies across companies and over time, we collected data on the series and available options for the Taurus, Accord, and Camry from the *Kelley Blue Book* for 1986 and 1990 and from Consumerguide.com for 2004.[140] Table 9 reports the results. It contains a set of statistics illustrative of the differences in the strategies of the three companies in 1986 and 2004 and their trends over time.

A simple measure of the extent to which options are not tied is the number of separately available options, which is reported for each brand in Column 5. The more options, the farther the product is from pure bundling. In 1986, the Taurus, with between thirty-two to fifty options, far exceeded the single option offered on the Accord or the five to nine offered on the Camry. By 2004, the number of separately available items on the Accord and Camry had not changed much. In contrast, the number of separately available options on the 2004 Taurus had dropped dramatically. The 2004 Taurus still had more separately available options than the Accord but about the same as the Camry.

The value of options ranges dramatically. To take that into account we also report the value of the options for each car both in absolute terms and as a

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Justice/Federal Trade Commission guidelines, this would be considered a concentrated industry for which a merger would receive close scrutiny. DEP'T OF JUSTICE & FED. TRADE COMM'N, 1992 HORIZONTAL MERGER GUIDELINES, *available at* http://www.ftc.gov/bc/docs/horizmer.htm (last visited Dec. 5, 2004).

138 Based on a 1982-84 base, the values for the CPI-U and the new car price index were 109.6 and 110.6 respectively in 1986. They were 184 and 134.7 in 2003. 2004 ECONOMIC REPORT OF THE PRESIDENT tbls. B60 & B61, http://www.gpoaccess.gov/eop/.

139 One of these three cars has been the best selling car in America each year for at least the last decade, and they have all been near the top when they haven't won the distinction. The Taurus won in 1994, among other years. *Best in Show: Ford Taurus*, AUTOWEEK, Jan. 1995, at 16. Honda won in 2001, among other years. Press Release, Honda, Honda Accord Best-Selling Car in 2001 Regains Title After a Decade (Jan. 3, 2002) (on file with authors). Camry won in 2003, among other years. Press Release, Toyota, Toyota Announces Best Sales Year in Its 46-Year History, Breaks Sales Record for Eighth Year in a Row (Jan. 5, 2004) (on file with authors).

140 The complete list and the structure of the offerings, which are complicated, are presented in an appendix which is on file with the *Yale Journal on Regulation* and available at David S. Evans & Michael A. Salinger, Why Do Firms Bundle and Tie? Evidence from Competitive Markets and Implications for Tying Law (May 20, 2004) (working paper), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=550884 (last visited Nov. 29, 2004).

percentage of the base price of the car.[141] The options available on the Taurus were a significant fraction of the base price of the car, and almost ten times more valuable than the options offered on the Accord. By 2004, the Taurus's option profiles were much closer to the Accord's. Toyota's strategy with the Camry appears to be between the other cars based on the value of options. While Toyota gave customers choices about a small number of features, those features tended to be of high value. One prime example is an air conditioner, for which the MSRP in 1990 on the Camry was $825. Also, in 2004, each Camry model had an optional V6 engine that was available as a separate item.

Table 9. Summary of Models and Options Available for Selected Cars

Year	Car Type	Number of Models	MSRP ($)	Number of Options	Total Price of Options ($)	Option Price/ Base Price
1986	Ford Taurus	3	10,170 - 13,838	32 - 50	4,784 - 8,079	35% - 79%
	Honda Accord	3	10,238 - 13,998	1	500	4% - 5%
	Toyota Camry	2	10,198 - 11,738	5 - 9	2,025 - 4,080	20% - 35%
2004	Ford Taurus	4	19,830 - 23,625	3 -13	1,185 - 4,050	6% - 19%
	Honda Accord	6	15,900 - 26,890	0 - 2	800 - 2,800	0% - 12%
	Toyota Camry	3	19,875 - 22,295	9 - 12	6,003 - 6,598	30% - 31%

Source: *Kelley Blue Book* (1986); Consumerguide.com (2004).

Over the period covered by this study, competition among the three cars was increasingly intense. Honda and Toyota added production facilities in the United States. Thus, if their tying strategies were originally driven by higher transportation costs and longer delivery lags, one might expect that they would have begun to offer customers more flexibility in their selection of options. Yet that did not happen. In 2004 Honda's strategy with respect to the tying of options was virtually identical to its strategy almost twenty years earlier.[142] An

141 Prices are based on Manufacturers Suggested Retail Price ("MSRP").

142 To be sure, Honda's strategy became somewhat more complicated, particularly for its higher end model. In 2004, there still were nominally three series. Yet the middle series was available with a more powerful engine. In turn, that engine was tied to other features. The highest-end model had a set of tiered options that could be added.

automatic transmission was the only separately available option on the base model. Ford's strategy changed dramatically, however. For example, in 1986, air-conditioning was a stand-alone option on the Taurus. In 2004, it was standard equipment on the base model.[143] That is, it was tied to the car itself (as opposed to other optional equipment).

Looking behind these broad measures provides further insight into the nature of bundling. In 1986, the only separately available option on each Accord series was an automatic transmission. Each higher-end series included a set of features not available on the most basic model. A customer who wanted an AM/FM radio on her Honda had to get it with a cassette player and, more significantly, air conditioning and six other features. The package containing the AM/FM radio cost $2,100—the difference between the mid-level and entry-level model. In contrast, a customer could get an AM/FM radio on her Taurus for $157—she could just get the base model with a radio and no other options.

The difference between the mid-level Honda Accord and the most expensive one provides similar examples. To take just one, to get the more powerful engine that came with the high-end Honda, a customer had to get a power moon roof for a total price of $1,660. But the Taurus customer could get either a more powerful engine for $672 or a power moon roof for $701 or both—an example of mixed bundling.[144] Remarkably, not even a radio was a tied option on the Taurus in 1986. While an AM radio was nominally standard equipment, all three Taurus models had a "Radio Delete" option that resulted in credit.[145]

C. *Sources of Bundling Economies*

We now consider the role of marginal cost savings, fixed costs, and the heterogeneity of demand in the bundling decisions we describe above. We begin by presenting some rough estimates of marginal cost savings and then discuss the evidence concerning fixed costs.

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143 Other features that had previously been optional and were now tied to the base model were a V6 engine, tilt steering wheel, power windows, power door locks, and intermittent wind-shield wipers.

144 The LX had two additional features: custom alloy wheels and a front and rear stabilizer bar. On the Taurus, there were two separately available options on wheels. The prices for styled road wheels were $178 on the L and GL and $113 on the LX. The prices for the cast aluminum wheels were $390 on the L and GL and $326 on the LX. KELLEY BLUE BOOK (1986).

145 It is our understanding from knowledgeable sources that the strategies of Honda and Toyota were a consequence of the higher transportation costs and longer delivery lags associated with importing from Japan. The logistics of delivering a car with specially ordered features were apparently simpler and less expensive within the United States. Another important institutional feature is that the Japanese manufacturers operated under voluntary import restraints during some of this period. While import restrictions quite plausibly affected the price the companies charged for each car and the mix of cars, it is not clear why they would affect tying behavior.

1. Marginal Cost Savings

We attempt to infer marginal costs of options by comparing the price of bundled offerings with the sum of the prices of the components of the bundles. This technique provides some insights but the numbers are likely confounded by price discrimination. We begin by comparing the Honda Accord and Ford Taurus in 1986. The extra features that came with the most luxurious Accord, the LX, could be purchased separately on the Taurus for $1,945. This sum is a slightly less than the incremental cost of buying the Accord LX rather than the mid-level Accord, the DX. Thus, this comparison provides no evidence of substantial savings from bundling, or at least no savings passed on to the consumer.

In addition to offering options separately, Ford had two tiered bundles of options available on each of the three series in 1986. The pricing of these packages provides another opportunity to look for evidence of bundling efficiencies. For the base package, the discounts were 6.1%, 15.1%, and 22.9% respectively on the entry-level, mid-priced, and deluxe models. For the premium package the discounts were 3.8%, 14.6%, and 24.1%. Particularly on the Taurus LX, the highest-end series, these discounts are substantial. Given how variable the discounts are, however, we suspect that the larger discounts reflect price discrimination.[146] We next turn to changes in the cost of options on the Ford Taurus between 1986 and 1990. The 1990 entry-level Taurus included three features that were not available in 1986 (including a driver's side air bag), two features that had been standard on the mid-priced model but not available separately on the entry-level model, and eight features that had been available separately on the entry-level model. Between 1986 and 1990 the price of the entry-level Taurus increased by $2,925 in nominal dollars, or $1,265 in 1986 dollars. We have estimated that the value of the eight items available separately in 1986 and included as standard equipment in 1990 plus the driver's side air bag to have been $1,637 measured in 1986 dollars.[147] These figures are close enough (particularly in light of the inherent imprecision of inflation adjustments) to conclude that the increase in the inflation-adjusted price of the Taurus was largely attributable to the additional features.

The fact that the inflation-adjusted price increased somewhat less than the value of the additional features might reflect some marginal cost savings. Even if it does, however, those economies are modest and cannot be said to be a central rationale for the increased tying.

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146 That is, the price differences do not reflect cost differences.

147 The sum of the prices of the eight items available separately in 1986 and standard in 1990 was $925. As these prices are in 1986 dollars, no inflation adjustment is needed. We could not find a year when a driver's side air bag was a separately available item on the Taurus. In 1989, however, it was a separately available item on the Ford Tempo, and the price was $815 in 1989 dollars or $712 in 1986 dollars.

An examination of the nature of the features reinforces this conclusion. Honda, for example, tied a more expensive sound system to an air conditioner. There is no obvious reason why the marginal cost of adding an air conditioner to a car should be less if the audio system has an FM radio and a cassette player.

As we have already noted, there has been a general trend in the automobile industry of increased tying as equipment that was once optional becomes standard. In some cases, this occurs because an item becomes too cheap to justify charging separately. This might well be the case with some electronic items like FM radios. But reductions in the cost of the option cannot explain all the increase in tying over time that we observe. Ford's decision not to offer the Taurus without air conditioning, which is a far more expensive item, is an example.

2. Product-Specific Scale Economies

The literature on activity-based costing argues that to offer many different products increases costs in real but hard-to-document ways. In a key article, Cooper and Kaplan describe the hypothetical case of two plants that produce the same number of pens: one produces one color and the other several colors. They conjecture:

> Despite the similarities in product and total output, a visitor walking through the two plants would notice dramatic differences. Plant II would have a much larger production support staff—more people to schedule machines, perform setups, inspect items after setup, receive and inspect incoming materials and parts, move inventory, assemble and ship orders, expedite orders, rework defective items, design and implement engineering change orders, negotiate with vendors, schedule materials and parts receipts, and update and program the much larger computer-based information system. Plant II would also operate with considerably higher levels of idle time, overtime, inventory, rework, and scrap.[148]

Several studies examined whether automobile manufacturing incurs such product complexity costs.[149] Fisher and Ittner studied the effects of option variability on costs based on data collected at the Mazda Hiroshima plant in 1991.[150] They found that option variability increased the amount of rework needed, increased the level of inventories, and increased production downtime. They concluded that reducing option variability by 10% saved roughly one hour of manufacturing labor per car.[151] This savings might seem modest, but note that the change in Ford's strategy with respect to options drastically

148 Robin Cooper & Robert S. Kaplan, *Measure Costs Right: Make the Right Decisions*, 88 HARV. BUS. REV. 96 (1988).

149 S.W. Anderson, *A Framework for Assessing Cost Management System Changes: The Case of Activity Based Costing Implementation at General Motors, 1986-1993*, 7 J. MGMT. ACCOUNTING RESEARCH 1 (1995).

150 Marshall L. Fisher & Christopher D. Ittner, *The Impact of Product Variety on Automobile Assembly Operations: Empirical Evidence and Simulation Analysis*, 45 MGMT. SCI. 771 (1999).

151 *Id.* at 782.

reduced the number of distinct options available and could well have reduced variability in options by much more than 10%.[152]

Moreover, the cost of product complexity documented in the studies cited above reflect only manufacturing costs. Fisher et al. found that product complexity increased costs of the distribution system as customers found it difficult to locate the cars that they wanted.[153] Thus, there seems to be evidence that product complexity due to option flexibility increased costs in ways that were not well understood in 1986. The increased amount of tying that has occurred since may be attributed to this effect.

3. Alternative Explanations

Price discrimination is common in the automobile industry, but it is not a plausible explanation for Honda's tying strategy or the change in Ford's over time. While under some circumstances tying can increase profits relative to pure components selling, theories of bundling as a form of price discrimination predict that mixed bundling can lead to even higher profits.[154] Indeed, by tying more options together, Ford reduced its ability to engage in price discrimination through mixed bundling.

Strategic leveraging explanations do not make sense here. The companies that initiated the strategy of tying were not the incumbents but the entrants. It is implausible that Ford tied[155] its cars to radios (by not allowing customers to delete the radio and get a price reduction) to monopolize the radio market or prevent radio manufacturers from evolving into a threat to its car manufacturing business.[156]

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152 *See* John Paul MacDuffie et al., *Product Variety and Manufacturing Performance: Evidence from the International Automotive Assembly Plant Study*, 42 MGMT. SCI. 350 (1996).

153 Marshall Fisher et al., *Strategies for Product Variety: Lessons from the Auto Industry*, *in* REDESIGNING THE FIRM 116 (Edward H. Bowman & Bruce M. Kogut eds., 1995).

154 *See* McAfee et al., *supra* note 50.

155 We are using tied in the economic sense of bundling components together. It seems counterintuitive that a car with a radio consists of two tied products rather than a single integrated product. However, two points are noteworthy. First, the economics of bundling helps explain why components become integrated—notably radios were not always integrated with cars. Second, the legal analysis of bundling focuses on whether there is demand for a component separately from the bundled product and if there is concludes that the bundled product is two products rather than one. The economics of bundling helps explain why that reasoning is wrong as we discuss below.

156 One other strategic factor one might consider is that there is an extensive literature on factors that facilitate collusion. *See* F. M. SCHERER & DAVID ROSS, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE (3d ed. 1990). One of the factors that makes collusion difficult is the complexity of the product offerings. The tying strategy does simplify the offerings, so one might hypothesize that the intent is to maintain pricing discipline. Despite the convergence among the strategies of the three companies, they still have distinct differences that would seem to leave in place any concerns that details of the pricing of options could be used to circumvent a tacitly collusive agreement.

D. *The Difficulty Identifying the Sources of Efficiencies*

If price discrimination and leveraging does not motivate the observed tying, then cost savings are the most likely explanation. As noted above, though, there is no apparent marginal cost savings from bundling. However, the car industry does experience the same sort of product-specific fixed costs present in the adapter case, whether or not they are obvious. Quantifying these efficiencies is difficult because it requires the sort of detailed internal cost information that is not publicly available. Even if they were it is not clear that one could isolate and measure cost savings from analysis of such data.

There is more tying of options in the automobile industry than there once was: features that used to be options are often now standard equipment. The cost of these additional features increases the price of cars. Those customers who want plain cars are harmed as a result. We doubt that many Taurus buyers in Houston would want to do without air conditioning, but there might well be car buyers who live in cooler climates who feel no need for it.

Studies for understanding the costs of product complexity are imperfect and controversial.[157] They are also costly. Published evidence about the issue likely exists for the automobile industry because it is the largest manufacturing industry in the world and the stakes are so high. There might be other businesses where the evidence is not collected but decisions are made because managers believe that product complexity increases costs.

The importance of this case is that it documents *increased* tying that occurred under competition. Of course, it did not occur under perfect competition, and there are enough complications in the case that others might push alternative explanations. In our view, though, the cost basis for tying is by far the most likely. Tying occurred not to segment markets or to foreclose independent parts suppliers. It occurred because Ford realized that the cost of variety was too great and that its attempts to provide each customer exactly what he or she wanted made Ford less able to meet the needs of what most customers wanted. Just as RadioShack had to limit its product offerings, so did Ford.

VI. Competitive Tying and Its Lessons

Tying is common in competitive markets. It results in lower costs for producers—which get passed on to consumers—or greater convenience, which benefits consumers directly. But these cost savings for producers and consumers are not necessarily easy to document. The price discounts in over-the-counter cold medicines provide persuasive evidence that there can be significant cost savings from bundling. But we were able to document that in large part because

157 *See, e.g.*, Christopher D. Ittner et al., *The Association Between Activity-Based Costing and Manufacturing Performance*, 40 J. ACCT. RES. 711 (2002).

the sellers did not tie—they offered products separately as well as combined. The cost savings are harder to establish in foreign electrical adapters or in other cases of pure bundling. The savings in packaging costs that presumably result in RadioShack tying all the adapters together in a single bundle may be quite modest; this evidence might not meet the court of appeals' skeptical view of proffers of efficiency evidence in *Jefferson Parish*. The same is true for automobiles. The most plausible explanation is that limiting the possible product variants reduces costs. But it is not clear that even a detailed investigation of automobile manufacturing would provide definitive evidence. In the latter two cases, we believe the cost savings explanations in part because we do not believe alternative explanations, such as anti-competitive foreclosure, which we can rule out because of the structure of these industries.

Our competitive theory of tying shows that the explanations for tying can be subtle in some situations. Marginal cost savings from packaging or other factors can result in bundling. In pharmaceuticals we saw that savings resulted in mixed bundling but not in tying.[158] But such savings are neither necessary nor sufficient to predict tying. Firms engage in tying when doing so reduces the fixed costs of offering one or more components separately. Such product-specific scale economies provide a plausible explanation for the pure bundling we observed in the foreign-adapter case (shelf space is the fixed cost) and the increased pure bundling we observed in the mid-sized automobile case (where product-specific scale economies arise from complexity).

A. *Implications for Tying Law*

The modified per se rule is not based on any generally accepted theory of how tying could harm competition or consumers. But it seems to be founded on two premises. The first premise is that denying consumers the choice of buying the tying product without the tied product is bad, while choice is good. The second premise is that when dominant firms deny consumers a choice they must be doing it to leverage their monopoly into the tied market or to protect their monopoly in the tying market. Otherwise they would not make consumers take something they do not want.

Our analysis shows that both premises are wrong, both theoretically and empirically. The first premise wrongly assumes that product choice is free. Businesses incur fixed costs when they make and distribute products. Adding a choice can result in lower consumer welfare in addition to lower producer welfare, as our theory has shown. This point is empirically clear—there are many product choices that some consumers would like to have that they cannot

158 At least not tying in the direction that would concern the antitrust laws. CVS engaged in mixed bundling. The brand-name producers sold the brand-name product separately plus a bundle that included a generic version of the other brand-name product. Neither brand-name company sold a generic version of the other brand-name product separately.

get, but businesses cannot always offer those choices profitably at prices that those consumers would be willing to pay.

The second premise, that tying is often used to leverage a monopoly into an adjacent market, is wrong because tying is common in competitive markets and therefore a source of efficiency. Our case studies show that in foreign electrical adapters and mid-size sedans reducing fixed costs was the most credible explanation for tying. That is not to say that tying could not be anticompetitive, but the economic theories we reviewed earlier show that even monopoly firms have the motive and ability to use tying for anticompetitive purposes only in quite special circumstances.

As a matter of theoretical and empirical economics, the modified per se test is not capable of identifying anticompetitive tying except by happenstance. The single-product test, which examines whether the tying and tied good are part of a "single product," is not a reliable proxy for examining whether there are efficiencies or not. Although there may be a demand for the tied product separately (e.g., shoe laces) it may be inefficient to provide the tying product (e.g., shoes) separately.[159] Thus, the efficient offering may be the bundle, which is the subject of legal concern, and the tied product. That is the case with foreign electrical adapters where RadioShack stores offer only a bundle of four adapters, any one of which can be purchased separately on the web. The coercion prong of the modified per se test is flawed as well. The decision not to offer a particular product configuration is routine, as we have seen, so there is no basis for presuming that coercion is a source of anticompetitive harm.[160]

At least three alternatives to the modified per se test have been proposed: First, keep the test but permit the defendant to offer an efficiency defense.[161] Second, replace the modified per se test with a rule of reason[162] allowing an explicit balancing of efficiencies against anticompetitive effects. Third, replace the modified per se test with a structured rule of reason where a series of screens focus on situations where the defendant has the ability and incentive to act anticompetitively. The final step of the structured rule of reason involves a balancing of anticompetitive effects and efficiencies.[163]

In all three cases the empirical evidence reported above cautions against imposing too heavy a burden on defendants to establish efficiencies. We have seen that even in competitive industries where we are confident that efficiencies

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159 Areeda observed the logical inconsistency in the single-product test. 10 AREEDA, *supra* note 39, at ¶ 1745(d)(2).

160 These same considerations apply whether the tie is based on a contract, a distribution arrangement, or integration. However, the form of the tie is a factor that should be considered in assessing efficiency and anticompetitive explanations.

161 In the EU, the defendant can offer an objective justification for the practice. JONATHAN FAULL & ALI NIKPAY, THE EC LAW OF COMPETITION 3.208-3.209 (1999).

162 The D.C. Circuit found that the rule-of-reason approach was more appropriate than the per se approach in the particular factual circumstances of software platforms. *Microsoft II*, *supra* note 24.

163 Ahlborn et al., *supra* note 2; Evans et al., *supra* note 20.

are the only plausible explanation for the practice, solid empirical evidence is not easy to produce. Suppose the firms in either the foreign adapter or mid-sized automobile cases had monopoly power. A finder of fact, looking only at the evidence in those particular cases, might worry that the efficiency explanations were being put forward as a pretext. Taken on their own terms, and ignoring the competitive structure of the industries, our efficiency explanations are, perhaps, no more persuasive than the efficiency explanation that was rejected by the Fifth Circuit and ignored by the Supreme Court in *Jefferson Parish*.

Our theoretical and empirical results therefore suggest that alternative rules that consider efficiencies should not impose too heavy a burden on the defendant. For a structured rule-of-reason approach, we recommend the following. Plaintiffs should have to show that the defendant has the incentive and ability to use tying to foreclose competition. As part of their responses, defendants could put forth an efficiency defense just as they do now under the rule of reason and the objective justification standard used in the EU.[164] Once the defendant has put forward a plausible efficiency defense, the plaintiff would have the burden of showing that the defense is pretextual.[165] In those circumstances where there is a plausible anticompetitive theory of tying as well as efficiencies, the last step of the rule-of-reason analysis would weigh the benefits from efficiency against the claimed anticompetitive foreclosure effects.

B. *Application to Cases*

In *Jefferson Parish*, the Supreme Court considered whether a hospital's exclusive contract with an anesthesiology practice constituted an illegal tie. The district court concluded that it did not, because the practice was efficient.[166] The Fifth Circuit rejected at least some of the efficiencies and ruled that the tie violated the per se prohibition on tying.[167] The Supreme Court found for the hospital, not because the tie was efficient, but because the hospital operated in a

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164 *See, e.g.*, Case C-333/94 P, Tetra Pak Int'l SA v. Commission, 1996 E.C.R. I-5951., ¶ 37 ("Consequently, even where tied sales of two products are in accordance with commercial usage or there is a natural link between the two products in question, such sales may still constitute abuse within the meaning of Article 86 unless they are objectively justified."). See also Case T-219/99, British Airways PLC v. Commission, 4 C.M.L.R. 19 (2004), ¶¶ 271, 284, where the Court of First Instance begins its analysis of British Airways' pricing scheme with the question "whether those [rebate] schemes were based on an economically justified consideration," and later concludes "[the rebate schemes at issue] cannot be regarded as constituting the consideration for efficiency gains or cost savings . . . ."

165 Dolman and Graf argue that the defendant should also have to show that it cannot achieve the efficiencies through less restrictive means. Dolmans & Graf, *supra* note 34, at 236. In practice, it is hard enough to document efficiencies, much less establish that they are being achieved through the least restrictive method. Evans & Padilla, *supra* note 34.

166 Hyde v. Jefferson Parish Hosp., 513 F. Supp. 532, 544 (E.D. La. 1981).

167 Hyde v. Jefferson Parish Hosp., 686 F.2d 286, 294 (5th Cir. 1982).

competitive market.[168] This was the right outcome, but the wrong reason. It ruled for the hospital only because it operated in a competitive market. In concluding that surgical and anesthesiology services were separate products, it implicitly dismissed evidence in the record of efficiencies from tying. But nothing in the record of the case suggests that the underlying economic analysis (if there was any) was sufficient to arrive at that conclusion.

The evidence may have demonstrated that there was some demand for the hospital's services without the hospital's anesthesiologists, but the extent of any such demand was unknown.[169] Moreover, there was no serious assessment of the costs to the hospital of unbundling anesthesiology services. The Supreme Court relied on the court of appeals' casual dismissal of claimed efficiencies. As noted above, our cost-based theory of bundling shows it is important to examine the practices in competitive markets and assess the demand for all of the possible product configurations. The Court's test did not enable it to receive evidence that consumers overall were harmed by the tying by the hospital.

Tetra Pak II is one of the major tying cases decided under Article 82 of the EC Treaty.[170] As with *Jefferson Parish*, the decision is not based on sound economic reasoning. Tetra Pak is an international packaging company with a very large share of the aseptic packaging business in many European countries, and a more moderate share of the non-aseptic packaging business. It faced entry into the aseptic packaging business in Italy. The Commission complained about a number of practices, one of which was Tetra Pak's requirement that customers take systems that included the packaging equipment and cartons. It also objected to Tetra Pak's requirement that it be allowed to inspect, repair and maintain the equipment; in fact, Tetra Pak reserved the right to inspect the machines without notice.

As with *Jefferson Parish*, Tetra Pak's efficiency explanation for the practice was quickly dismissed. The company claimed that its system-related requirements were necessary to reduce its exposure to products liability and to ensure public health.[171] The Commission dismissed this explanation on the

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168 *See supra* Section I.A.

169 According to the Court,

> The evidence indicates that some surgeons and patients preferred respondent's services to those of Roux, but there is no evidence that any patient who was sophisticated enough to know the differenee between two anesthesiologists was not also able to go to a hospital that would provide him with the anesthesiologist of his choice.

Jefferson Parish Hosp. v. Hyde, 466 U.S. 2, 30 (1984).

170 *See* Case C-333/94 P, Tetra Pak Int'l SA v. Commission, 1996 E.C.R. I-5951; Case T-83/91, Tetra Pak Int'l SA v. Commission, 1994 E.C.R. II-755; Case IV/31.043, Tetra Pak II, 1992 O.J. (L 72) 1.

171 As the Commission described,

> In addition to the economies of scale and eost savings at the level of raw materials and distribution which may result from stable relations with customers over a long period, the exclusive purchasing obligation is, in Tetra Pak's view, justified for technical reasons, considerations of product liability and health, and by the need to proteet its reputation . . . .

grounds that Tetra Pak could achieve the same objective through less restrictive means.[172] But this analysis ignores transaction costs. Tetra Pak systems were used to package food. Misuse presumably could have resulted in tainted food and, as a result, illness or even death in large numbers. A court might well have had trouble assessing fault and, as a result, Tetra Pak could have faced liability.[173] Moreover, Tetra Pak's future sales could have been affected if packagers lost confidence in its systems. Less restrictive means might in fact be harder to enforce. For example, one might argue that Tetra Pak should establish specifications for cartons used on its machines but then allow its customers to purchase any cartons that met the specifications. Tetra Pak could not, however, simply assume that its customers would abide by the agreement. It would have to monitor purchases of supplies. It would also have to set up a certification system for carton suppliers to become "qualified suppliers" and it would have to monitor the suppliers' performance to make sure that they maintained their standards.

Our point is not that Tetra Pak had a valid efficiency justification. It could have been a pretext for engaging in a massive price discrimination scheme or an attempt to foreclose entry into aseptic packaging schemes.[174] Rather, we view

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> On the question of health, Tetra Pak considers that, in view of the specific interactions between the machines and the packaging intended for them, only the use of Tetra Pak cartons can prevent the emergence of public health problems which might prove extremely detrimental to the consumer, above all in the aseptic sector.

Case IV/31.043, Tetra Pak II, 1992 O.J. (L 72) 1, ¶ 118.

172 *Id.* at ¶¶ 119-120. This position was endorsed by the European Court of Justice in Case T-83/91, Tetra Pak Int'l SA v Commission, 1994 E.C.R. II-755.

> The technical considerations and those relating to product liability, protection of public health and protection of its reputation put forward by Tetra Pak must be assessed in the light of the principles enshrined in the judgment in Hilti v Commission . . . in which the Court of First Instance held that it was 'clearly not the task of an undertaking in a dominant position to take steps on its own initiative to eliminate products which, rightly or wrongly, it regards as dangerous or at least as inferior in quality to its own products.'

Id. at ¶¶ 136-140. The court reaffirmed its position in Case C-333/94, Tetra Pak Int'l SA v. Commission, 1996 E.C.R. I-5951.

> It must, moreover, be stressed that the list of abusive practices set out in the second paragraph of Article 86 of the Treaty is not exhaustive. Consequently, even where tied sales of two products are in accordance with commercial usage or there is a natural link between the two products in question, such sales may still constitute abuse within the meaning of Article 86 unless they are objectively justified. The reasoning of the Court of First Instance in paragraph 137 of its judgment is not therefore in any way defective.

Id. at ¶ 37.

173 For example, under German law, the machine manufacturer may be held liable for damages a consumer has suffered due to tainted food if (i) the latter establishes that the food or its packaging was defective, (ii) that this has caused damage, and (iii) the machine manufacturer is not able to prove that the machine was not defective and thus cannot have contributed to the damage. In addition, the manufacturer of a primary product may be held liable if he does not sufficiently supervise the further use of his product and issues warnings if his product turns out not to properly interact with certain secondary products, even if the primary product was verifiably not defective. Entscheidungen des Bundesgerichtshofes in Zivilsachen [BGHZ] 99, 167 (Case IV ZR 65/86, Decision of December 9, 1986).

174 Nalebuff and Majerus label *Tetra Pak* as "the poster child for anticompetitive bundling, tying, and portfolio effects." BARRY NALEBUFF & DAVID MAJERUS, BUNDLING, TYING, AND PORTFOLIO

Tetra Pak as an example in which a plausible efficiency defense was rejected on grounds that ignore commonplace contracting problems. In practice, the efficiency defense is neutered through dismissive claims that the efficiencies are not important or could be achieved in other ways.

VII. Conclusion

Tying is common under competition. Product-specific scale economies are a major factor in making tying efficient. By limiting product selection—for example, by refusing to sell the tied good without the tying good—firms can reduce overall costs. The product-specific scale economies that give rise to tying under competition are just as likely to be present and to result in tying when firms have market power. Like other practices that are common under competition, tying should be treated under the rule of reason. The fact that product-specific scale economies are not easy to document in practice, together with the fact that tying is presumptively efficient, leads us to argue that defendants should not bear too onerous a burden of proving efficiencies.

EFFECTS: PART 2, CASE STUDIES, at 16 (U.K. Dep't of Trade & Indus., DTI Economics Paper No. 1, Feb. 2003). The apparent basis for the claim is that Tetra Pak's behavior was broadly consistent with economic models of tying as a metering device. Their extreme conclusion is unwarranted for several reasons. First, as a matter of logic, behavior that is consistent with a particular economic model cannot prove that the model provides the explanation. One has to rule out the plausible alternatives which, in this case, have to include efficiencies. Second, even if they are correct about the motive, pricing schemes of this sort are not necessarily harmful to consumers. *See* Robert D. Willig, *Pareto-Superior Nonlinear Outlay Schedules*, 9 BELL J. ECON. 56 (1978).

TYING

The Poster Child for Antitrust Modernization

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I. INTRODUCTION

Tying is an area of antitrust in desperate need of modernization.

First, tying is an utterly common business practice in competitive markets. That distinguishes this practice from all other practices subject to *per se* prohibitions[1] and to many other practices, such as pricing below cost, that are considered suspect under a rule of reason analysis.

Second, there is no support in modern economics for either a general *per se* prohibition against tying or the particular test adopted by the Supreme Court in its 1984 *Jefferson Parish* decision. Economists recognize that tying results in efficiencies that benefit consumers although tying could be used, in particular situations, for anticompetitive purposes. There is no basis for singling tying out for *per se* condemnation from among the range of possible unilateral practices.

Third, only deference to precedence stopped the Supreme Court from subjecting tying to a rule of reason inquiry in *Jefferson Parish*. Four judges wanted to go to with the rule of reason. The five-judge majority recognized that tying was often pro-competitive, but they could not bring themselves to break with many decades of hostility towards tying.

Fourth, it is the only unilateral practice by businesses other than minimum resale price maintenance that is the subject of a *per se* prohibition under the Sherman Act.[2] In the last quarter century the courts have gradually subjected all other unilateral practices to a rule of reason inquiry that considers, among other matters, whether the practice harms consumers on the one hand and whether the practice generates efficiencies on the other hand.

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[1] We do not have much empirical evidence about whether minimum resale price maintenance would be common in competitive markets, as it is subject to *per se* condemnation.

[2] I use "unilateral" to refer to single-firm practices such as tying, predation, and vertical restraints, whose potential for anticompetitive effects comes from eliminating competition from other firms. In contrast, the potential anticompetitive effects from collusive practices such as price fixing come from lessening the vitality of competition from the firms party to the agreement. I do not mean unilateral in the sense of an absence of an agreement that is subject to Section 1 of the Sherman Act.

The archaic *per se* rule against tying is a remnant of a now distant past in which economic analysis had little role in antitrust laws.

This article establishes the four points above. Section II documents the pervasiveness of tying in competitive markets. Section III examines the modern economic understanding of the pro-competitive and possibly anti-competitive explanations for tying. Section IV reviews the *Jefferson Parish* decision and some of the prior and subsequent case law. Section V compares the evolution of tying doctrine to that of other unilateral practices. It argues that the courts should abandon *Jefferson Parish* in favor of the rule of reason or that Congress should mandate this result as part of its ongoing consideration of modernizing the antitrust laws.

II. TYING IS A COMMON BUSINESS PRACTICE

Most products are bundles of features that could be and sometimes are provided separately.[3] Consider a morning in the life of a typical consumer. Her alarm clock goes off—this might be a radio alarm clock or the one on her mobile phone. From her doorstep she gets the Washington Post, which includes national and international news, sports, perhaps local Virginia news, and arts. For breakfast she has a bowl of Apple Cinnamon Cheerios, though she has to add the milk herself. She turns her television on to watch CNN; she skips past House and Garden TV, which she must take as part of her cable package but never watches. Then she steps into her SUV and turns on the radio, which came with the car, and, if she does not know where she is going, perhaps even uses the built-in GPS navigation system. Bundling does not cease when she gets to her office. The building probably includes security services, cleaning, and other amenities. She boots up her computer, which is a bundle of an operating system, applications software, a computer chip, and perhaps a DVD

[3] Paul Seabright, Tying and Bundling: From Economics to Competition Policy, Presented at CNE Market Insights Event (Sept. 19, 2002) (transcript available at http://www.cne.org/pub_pdf/2002_09_19_tying_bundling.htm); Michael A. Salinger, Challenges in Identifying Anticompetitive Dominant Firm Behavior, Speech before The National Economic Research Associates 2005 Antitrust And Trade Regulation Seminar, (July 7, 2005) (transcript available at http://www.ftc.gov/speeches/salinger/050711santefe.pdf); William J. Adams & Janet L. Yellen, *Commodity Bundling and the Burden of Monopoly*, 90 Q.J. ECON. 475 (1976); Yannis Bakos & Eric Brynjolfsson, *Bundling Information Goods: Pricing, Profits, and Efficiency*, 45 MGMT. SCI. 1613 (1999).

player. As a surgeon, her patients get a bundle of services from the hospital including nursing, anesthesiologists, and meals.

In all these cases firms are making two related decisions. The first concerns how they design their products. What should be included and how should the parts interrelate? The second concerns which products to offer. Should the firm offer only one product or should it offer several with different combinations of features? The answers to these questions depend on the demand for different product configurations and the cost of providing these to consumers.

A. Product Design and Offers

To illustrate the decisions that firms make about how to design their products and what products to offer to consumers consider a simple case in which there are two components **A** and **B**. Each is valuable to consumers in its own right.[4] The possible products are listed in Table 1. Three cases are particularly important.

(a). *Components-selling* occurs when the firm offers **A** and **B** separately (cars and bicycle racks).

(b). *Pure bundling* is when the firm only offers **A** and **B** together as the bundled product **AB** (men's laced shoes).

(c). *Mixed bundling* refers to when the firm offers the bundle **AB** and either or both of its components **A** and **B** (The Sunday *New York Times* and the *New York Times Book Review*).

With two components, there are three possible "products" and seven possible product configurations, as shown in Table 1. The number of products and configurations increases exponentially with the number of components. Thus with three components there are seven possible products and 127 possible product configurations.

It is useful to introduce a legal concept of bundling called a "tie" at this point—we will return to this when we discuss the possible anticompetitive uses of

[4] For more detail on this model, *see* David S. Evans & Michael Salinger, *Why Do Firms Bundle And Tie? Evidence From Competitive Markets And Implications For Tying Law*, 22 YALE J. ON REG. 37 (2005).

bundling. A product configuration is said to involve a "tie" when it is possible to get one component only as part of a bundle. That is the case with product configurations 4-6 in Table 1. Pure bundling necessarily involves a tie. Mixed bundling involves a tie when it is not possible to get one of the components. Generally, antitrust policy concerns itself only in those situations when buyers can get a tied component only by taking another component for which the firm has market power.

Table 1: Products that can be sold based on two components

	A	**B**	**AB**
1. Components selling	X	X	
2. Components selling	X		
3. Components selling		X	
4. Pure bundling/Tie			X
5. Tied Mixed bundling	X		X
6. Tied Mixed bundling		X	X
7. Full Mixed bundling	X	X	X

Firms make different decisions on product designs and offers within the same industries. Some may offer only components while others may offer only bundles and still others may engage in mixed bundling. Consider the most popular mid-sized automobiles sold in the United States: Ford Taurus, Honda Accord, and Toyota Camry. The Accord comes in six models that have between none and two options. The Camry has three models with between nine and 12 options. And the Taurus has four models with between three and 13 options. Across car segments there is even greater variation. Porsche is famous for having an enormous number of options that allow purchasers to customize their cars. All of these automobile makers, however,

include tires on their cars. They purchase these from tire manufacturers and none sells tires separately.[5]

The framework above can also be used to think about another form of bundling—selling multiple units of a product or other volume-based arrangements. The components are the individual units of the product. A pure bundle would be a fixed number of units—say a package containing 100 units. And mixed bundling would entail different package sizes: say 25, 100, and 500 units.

B. Reducing Producer and Consumer Costs

Bundling decisions affect costs for both producers and consumers.[6] In both cases it is useful to divide these into costs that vary with each unit (marginal costs) and costs that are lumpy over a range of units (fixed costs).

1. Producers

For producers, multiple offerings can raise the fixed costs of production and sales in several ways. There may be diseconomies of scope of producing multiple separate products. For example, studies of automobile manufacturing have found that making many options available increases what are called "complexity costs." Maintaining and managing different SKUs (Stock Keeping Units) also costs money. Separate products require separate packaging and shelf space, each of which raises costs.[7] Marginal costs also vary for some products. It is cheaper to produce one pill that contains headache and pain reliever medicine than to produce two.

It is also possible that there are diseconomies in both fixed and marginal costs of offering components together. Combining features may increase costs directly by making these products more complex and much harder to make. And complexity

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[5] Evans & Salinger, *supra* note 4.

[6] Patrick Rey, Paul Seabright, & Jean Tirole, The Activities of a Monopoly Firm in Adjacent Competitive Markets: Economic Consequences and Implications for Competition Policy, (2002) (IDEI Working paper); David S. Evans & Michael A. Salinger, The Role of Cost in Determining When Firms Offer Bundles and Ties, *available at* http://ssrn.com/abstract=555818 (2004) (Working paper).

[7] David S. Evans & Michael A. Salinger, The Role of Cost in Determining When Firms Offer Bundles and Ties, *available at* http://ssrn.com/abstract=555818 (2004) (Working paper).

may have indirect effects as well, such as raising the likelihood of products breaking down, raising support costs for customers, and increasing the costs of repair. The marriage of computers and automobiles is an example. Owners of Dodge 2001 minivans have, according to the New York Times, "posted anguished cries ... about electronic gremlins that stop windows from rolling all the way up, that unexpectedly dim the interior lights, that drain batteries or that make engines sputter."[8]

2. Consumers

Consumers may realize savings when getting products together, assuming they value them at all. If you like to read about sports and arts every day it is cheaper to get a newspaper with both. And if you have a cold and a headache it is more convenient to get a single package of pills. Letting the producer make choices for you saves you time as well. When we go to the hospital for surgery most of us would prefer to leave most of the choices of the components to the experts rather than do it ourselves. Downloadable music lets us pick individual songs for our collections. But many might prefer the bundles the artists and publishers put together themselves. Choice is costly because it takes time and effort to make informed decisions, ones that others may be able to do more efficiently. More generally, bundling reduces transaction and search costs for consumers.

Bundling may have disadvantages as well in some cases. Consumers may prefer to mix and match components—a common strategy in building home entertainment systems and increasingly popular for music collections. For example, while most consumers are happy to have air conditioning as standard equipment in most automobiles today, perhaps some in colder climates preferred the days when it was an option.[9]

3. Implications for Product Design

The costs for consumers and firms help explain the products that businesses actually offer from among the many they could offer. Firms have to weigh the

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[8] Tim Moran, *What's Bugging the High-Tech Car?*, N.Y. TIMES, Feb. 6, 2005, at 14.
[9] For a discussion of bundling in automobile packages, *see* Evans & Salinger, *supra* note 4, at 79.

demand for a particular product offering against the costs of making it available as a stand-alone product or as part of another product. Many products are not offered at all because there is not enough demand to warrant businesses incurring the costs of producing and distributing them. Some men would no doubt prefer to get their shoes without shoelaces because they have a favorite shoelace they like to use. But the number is probably so few that it would not pay to offer this option at shoe stores. Other products are offered only separately because few people want them as a system. Although this is changing, many families buy their own ingredients for dinner rather than prepackaged meals. In other cases there is enough demand for the components and the bundle for producers to offer it both ways.

Consider a simple example. 100 consumers would pay $10 for **A**; 50 would pay $6 for **B** and 10 would pay $20 for **AB**. It costs $1 to produce each unit of **A** and **B** and $2 to produce each unit of **AB**. Fixed costs are $200 for each of these three products. In this case the unit cost, for meeting all demand, of **A** is $3, the unit cost of **B** is $5, and the unit cost of **AB** is $22. Each component could be provided separately for a profit—since the consumer willingness to pay for each unit is greater than the cost of producing each unit ($10 vs. $3 for **A** and $6 vs. $5 for **B**). However, the bundle cannot be provided profitably because the unit costs exceed what people will pay (it costs $22 to make **AB** and consumers will only pay $20). The problem here is lack of demand. Not enough people want the bundle to make it profitable to provide.

Firms sometimes offer pure bundles because, even though some consumers do not want portions of the bundle, it is cheaper to sell the components together. To see the intuition consider the extreme case in which each of several types of consumers want one component but none of the others. If the fixed costs of providing each of the components is high enough, it pays to combine these together. It is cheaper to give consumers a component they do not want than to provide the component they do want separately. The manufacturer saves money and the consumer often gets a lower price than she would otherwise.

A simple example illustrates this. There are two consumers. Person 1 is willing to pay $5 for **A** and nothing for **B**; person 2 is willing to pay $5 for **B** for but nothing for **A**. It costs the manufacturer $2 for **A** and **B** separately. The fixed cost of offering a product at all is $1. The manufacturer could sell a unit of **A** and **B** separately for $5 each, collect $10 in revenue, incur $4 in manufacturing cost and $2 in product-offering cost, and make a profit of $4. Or it could sell a bundle **AB** for $5, collect $10 in revenue, incur $4 in manufacturing cost and $1 in product-offering cost, and make a profit of $5. Bundling is the best strategy. In this case the manufacturer pockets the difference but with competition some of the cost savings would get passed on to the consumer. Moreover, if the fixed cost of offering a product was $5 it would not be profitable to offer **A** or **B** (the additional $4 in fixed cost wipes out the profit of $4)—but it would be profitable to offer **AB** (the manufacturer would earn $1 of profit). We will see later that being able to segment consumers is one of the explanations for this phenomenon. But the other one—and the one we emphasize here—is that the manufacturer can avoid the multiple fixed costs of offering separate products.

It is easy to see from these considerations why firms offer only a fraction of the products—defined by the combination of components—they could. The examples above involve just two components for which there are three possible products. With three components there would be seven possible products (**ABC**, **AB**, **AC**, **BC**, **A**, **B**, **C**); with ten there would be 1023. Even minimal fixed costs of offering these configurations to manufacturers or consumers would encourage producers to reduce the number of offerings to those for which there is significant demand. If you think about the products you buy, while you may have a great deal of choice you have infinitely less than you could have if firms did not bundle components—and things that could in principle be sold separately—together.

C. Exploiting Demand

Firms bundle components because it enables them to sell more and usually make more profits. That can be true for three demand-related reasons.[10]

1. Complementary Components

The "give away the razor to sell the blades" strategy is famous in business and economics. This approach is profitable because the razor and the blades are complements—a decrease in the price of one increases the demand for the other. In some cases decreasing the price of one component to nothing makes sense. The firm loses money on that component. But it stimulates the demand for the other component on which it does make money. With products that are strong complements, the profits from the positively priced component makes up for losses on the zero-priced component.

So far this does not say anything about bundling. But it often saves distribution and packaging costs to sell two goods together. If the firm is giving one away for free anyway it might as well avail itself of these cost savings. Not surprisingly, razors and blades are usually included in the same package. Consumers benefit from this.

2. Aggregating across Consumers

Firms may also find that it pays to bundle even if demands are not complementary. We already saw an example of this above. Bundling persuaded two consumers to buy a product even though each wanted only a single component. This saved the manufacturer costs.

More generally, businesses can exploit the law of large numbers when they are producing products that have many components.[11] Consumers place different valuations on the various features available to them. You value the arts section of the

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[10] William J. Adams & Janet L. Yellen, Commodity Bundling and the Burden of Monopoly, 90 Q.J. ECON. 475 (1976); Yannis Bakos & Eric Brynjolfsson, *Bundling Information Goods: Pricing, Profits, and Efficiency*, 45 MGMT. SCI. 1613 (1999).

[11] *See* Richard Schmalensee, *Commodity Bundling By Single-Product Monopolies*, 25 J.L.& ECON. 67 (1982); Yannis Bakos & Erik Brynjolfsson, *Bundling Information Goods: Pricing, Profits, and Efficiency*, 45 MGMT. SCI. 1613 (1999).

newspaper highly while your spouse does not care much for it; your spouse values the sports section highly while you do not care much for that section. The valuations for any component can be quite dispersed across consumers with different tastes. If you combine all these components into a single product the variations tend to cancel each other out. At any given price there will be more people who will buy the bundle than would buy any component or subset of components.

This of course means that many people are getting components that they do not care for. But if it does not cost much to provide these components and if it is expensive to offer multiple product versions, bundling components together into a single product typically expands demand. These assumptions are especially likely to hold for information goods for which the marginal cost of providing the product (and any component of it) is low and the costs of developing and distributing the product is high. Newspapers are a good example. They provide many features from crossword puzzles, to astrology tables, to business, to dance that only a portion of their readers care about. But relative to the cost of producing the newspaper these features are not that expensive to add. By including them the newspaper brings in more readers at its typical price, sells more copies, and therefore covers more of the fixed costs of producing the paper.

Generally, consumers are better off as a result of such bundling.[12]

3. Price Discrimination

Despite its name, economists generally view price discrimination as benign or welfare enhancing since it enables firms to increase output and recover fixed costs.[13] Different product combinations also enable firms to charge different prices to different consumer segments in order to extract more of their willingness to pay. A few of the examples above can be characterized this way although their key feature

[12] Yannis Bakos & Erik Brynjolfsson, *Bundling Information Goods: Pricing, Profits, and Efficiency*, 45 MGMT. SCI. 1613 (1999).
[13] *See* the discussion of price discrimination in JEFFREY M. PERLOFF & DENNIS CARLTON, MODERN INDUSTRIAL ORGANIZATION 301-308 (2005).

was that the bundling strategy was driven by the need to cover costs and attract enough consumers.

The idea that bundling can be used to price discriminate dates back to a paper by Nobel-prize winning economist George Stigler. Stigler tried to explain why movie distributors required movie houses to take bundles of pictures. Suppose for Movie A exhibitor 1 is willing to pay $8,000 and exhibitor 2 $7,000; for Movie B exhibitor 1 is willing to pay $2,500 and exhibitor 2 $3,000. If the movie distributor charges a single price to the two distributors, it would charge $7,000 and $2,500 to attract both exhibitors; the distributor collects $9,500 from each for a total of $19,000. But consider how much the exhibitors would pay for both movies: A would pay $10,500 and B would pay $10,000. Thus if the distributor charged $10,000 for the bundle if would collect $20,000. It therefore makes more money.

Bundling can be used in a different way. Different groups of consumers place varying values on groups of components. It is possible to design packages that segment these consumers. Some will want the car with the sports package, while others will want the basic package. The firm can then charge a premium to groups that have a particularly high demand for a particular package, and offer an especially aggressive price to consumers that are very sensitive to price but are also willing to take the no frills deal. For this to work there must be a predictable correlation between combinations of components and demand (e.g. elastic demand, low demand for frills). A number of studies have found, for example, that automobile companies have much higher markups on luxury models than base models.[14]

D. Summary Optimal Product Design and Product Offerings

There is no single explanation as to why businesses offer pure components, mixed bundling, or pure bundling. The most profitable strategy depends on the

[14] Steven Berry, James Levinsohn, & Ariel Pakes, *Automobile Prices in Market Equilibrium*, 63 ECONOMETRICA 841 (1995).

particular cost and demand situation faced by the firm as well as what the competition is doing. But there are some general tendencies.

Firms offer pure bundles of components when:

- There is little demand for other combinations of these components relative to the cost of offering them.
- The marginal cost of including components is very low relative to the additional customers that are pulled in.
- Pure bundling is an effective method for appealing to different customer segments.

Firms offer mixed bundles when:

- There is sufficient demand for a product configuration relative to the cost of offering it.
- Different bundled offerings facilitate segmenting customers.

Firms offer components without any bundles when:

- There is little demand for combining components or consumers can do this themselves very easily.
- The fixed or marginal costs of combining components are prohibitive relative to demand.

Economists have identified circumstances in which firms may not offer the product configurations that are identical to what an all-knowing planner, seeking to maximize social welfare, would do. For example, under certain assumptions firms offer too much product variety and offer bundles that are socially inefficient. Under other assumptions, they might not offer bundles that would benefit consumers. But there is no theoretical basis for concluding that there are systematic biases or biases

that can be identified, much less corrected, through regulatory intervention.[15] Moreover, these possibilities should not make us lose sight of the fact that bundling of features saves producers and consumers money, provides consumers with products they want, and is often a source of product innovation.

III. ANTITCOMPETITIVE TYING CAN OCCUR ONLY UNDER SPECIAL CONDITIONS

Despite its pervasiveness, antitrust courts and regulators have fretted over the anticompetitive use of bundling for many years. Economists have found that there are, at least in theory, situations in which firms could use bundling strategically to harm competition and consumers. But, by and large, we seem to agree that most concerns about tying are misplaced.

A. Single Monopoly Profit Theorem

The famous Chicago single-monopoly profit theorem shows that, under certain assumptions, firms with monopoly power in one market do not have the incentive to attempt to extend their monopoly power to other competitive markets. Either price discrimination, which few economists find objectionable, or efficiencies, which of course we applaud, would seem to be more plausible explanations for tying.

Take the case in which a firm has a monopoly in ***A*** and consumers use the monopoly product ***A*** and another product ***B*** in fixed proportions. Examples include cars and radios, computers and microprocessors, and shoes and shoe laces. The marginal cost of supplying ***B*** is c, which equals its price under competitive supply, p_c. Consumers have a final demand for the combined product ***A+B***. The monopolist maximizes profit by determining the profit-maximizing price for this combination.

[15] *See* Evans & Salinger, *supra* note 4. *See also*, Bakos & Brynjolfsson, *supra* note 12.

That gives the monopolist the most profit it could possibly obtain. The monopolist can achieve this profit in several ways.

- Offer the bundle at a combined price p_c.
- Offer ***A*** only at a price p_c-c and have consumers purchase ***B*** from competitive suppliers.
- Offer ***A*** at a price of p_c-c and ***B*** at a price of c along with the other competitive suppliers.

From the monopolist's standpoint, it has nothing to gain by getting a monopoly in ***B***. It would still collect the same monopoly profit based on the combined price of p_c.

Interestingly, the only incentive for the monopolist in this example is to make sure that some firm is selling ***B*** competitively. It wants to avoid what economists call the "double monopoly markup" problem.[16] If another firm had a monopoly in ***B*** that firm would restrict the output of ***B*** and raise its price above c. That would tend to reduce the sales of ***A*** and hurt the ***A*** monopoly's profits. So in this case monopoly ***A*** has an incentive to create competition in ***B***. It might do that, perhaps, by producing ***B*** itself.

Many products that might be provided as bundles, however, are not used in fixed proportions. For example, fax machines use varying amounts of ink cartridges over time and people eat varying amounts of bread when they dine. The single-monopoly profit theorem does not necessarily hold when ***A*** and ***B*** are used in variable proportions. With varying proportions, the monopolist still has incentives to want competitive supply and has limited interest in monopolizing the other product.[17] However, there are possibilities for increasing monopoly profit through bundling with variable proportions that would need to be considered. In many of these cases, however, profits can be increased because bundling facilitates price discrimination.

[16] See the discussion of "double monopoly markup" in PERLOFF & CARLTON, *supra* note 13, at 415.
[17] With variable proportions, tying can become a means to facilitate price discrimination, although it should be noted that price discrimination can increase social welfare. *See* PERLOFF & CARLTON, *supra* note 13, at 321-322, 306-307.

Generally, economists do not look on such price discrimination with disapproval since it can increase social welfare (although it may not).

B. Acquiring or Maintaining Monopoly Through Tying

Not much that economists say is airtight and the Chicago-inspired view that tying was benign or efficient is no exception. Economists have identified two scenarios in which monopoly firms have the incentive and the ability to tie their monopoly product ***A*** to a product ***B*** that is not a monopoly product. Both cases only apply when ***A*** and ***B*** are not used in fixed proportions. The crux of both scenarios is that there are scale economies in the production of ***B***. By foreclosing enough demand to competing producers of ***B,*** the monopolist denies them scale economies and captures the ***B*** market.[18]

In these cases it is possible to identify situations in which (1) the monopolist finds that it is profitable to tie ***B*** to ***A*** to foreclose the market to competing ***B*** suppliers and (2) raise the price of ***B*** higher than it would be in the absence of this foreclosure and (3) thereby reduce consumer welfare. Carlton and Perloff give the example of a hotel on an island whose guests like to play tennis.[19] By tying the use of the hotel to the use of a tennis club the hotel can deny enough volume to other tennis clubs and end up with a tennis club monopoly. It will then be able to charge guests and non-guests a higher price for playing tennis.

It is also possible to find situations in which the monopolist finds it beneficial to monopolize the ***B*** market because it is possible that the ***B*** producers will evolve over time into competitors. Therefore, the monopolist engages in foreclosure to prevent an erosion of its profits in ***A*** rather than to obtain profits in ***B***.[20] That was the theory behind the antitrust case against Microsoft involving an internet browser. Microsoft, the argument went, saw Netscape as a potential software platform rival to

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[18] Jean Tirole, *The Analysis of Tying Cases: A Primer*, 1 COMPETITION POL'Y INT'L 1 (2005).
[19] PERLOFF & CARLTON, *supra* note 13, at 389.
[20] Dennis W. Carlton & Michael Waldman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries*, 33 RAND J. ECON. 194 (2002).

Windows. Rather than risk the Netscape browser evolving into a competitive threat to Windows, Microsoft tried to eliminate Netscape through tying.[21]

Economists who have authored papers identifying these possible anticompetitive uses of tying have been careful to note that they are special cases and that one would need to determine whether the conditions under which they could occur apply in the particular case in question.[22]

Three observations about these theories on the anti-competitive use of tying are worth keeping in mind:

- The tying strategies used by the would-be monopolist in these theories are costly. The monopolist provides a suboptimal package to consumers (it denies them choices they would like to have) and therefore sacrifices profits. It must weigh these losses against future gains resulting from foreclosure.
- These tying strategies only work if the monopolist can completely foreclose competition in the tied-good market, or at least substantially reduce it. The success of the strategy, therefore, depends on the existence of barriers to entry into the tied good market.
- Foreclosure of competition in the tied good market does not necessarily lead to lower consumer welfare.

C. Loyalty rebates and other complex pricing strategies

It is also possible to cause competitive harm through the use of sophisticated pricing strategies. First, it is possible for a firm to offer a mixed bundle but at prices that effectively force consumers to take the tied product. That would be the case if the bundle were substantially cheaper than the sum of the components, so that

[21] This is not the place to debate this. However, my views on this can be found in David Evans, Albert Nichols & Richard Schmanlensee, *An Analysis of the Government's Economic Case in U.S. v. Microsoft*, ANTITRUST BULLETIN (Summer 2001); David Evans, Albert Nichols & Richard Schmalensee, U.S. v. Microsoft: Did Consumers Win?, *available at* http://www.nber.org/papers/w11727 (Oct. 2005) (Working paper).
[22] *See* Carlton & Waldman, *supra* note 20. *See also*, Michael D. Whinston, *Tying, Foreclosure, and Exclusion*, 80 AM. ECON. REV. 837 (1990).

consumers pay less than the competitive price to obtain the tied product. This situation has the same economic effects as the tying case that we discussed above.

Second, it is possible for a firm to engage in "loyalty rebates" that make it prohibitively expensive for a consumer to buy any component of a bundle from a competitor. For example, suppose a "monopoly" seller gave consumers a 20 percent discount if it purchased 90 percent of its requirements for products A, B, and C from the company. In this case, a competing supplier would have difficulty competing for a significant (more than 10 percent) portion of the buyer's business. The buyer would lose the entire 20 percent discount on all of its purchases as a result of falling below the 90 percent threshold.

Whether and under what circumstances loyalty discounts are anti-competitive is a subject of much debate among economists and in the antitrust case law.[23] On the one hand, loyalty and other volume-related discounts lead to lower prices that we do not want to discourage. On the other hand, it is possible that such discounts could preclude entry and sustain a monopoly. Whether the loyalty discounts actually do foreclose competitors is an empirical question that depends on the magnitude of the discounts and the extent to which firms can compete for the entire contract.[24]

So what do we take from the economics literature on tying? It is possible to identify situations in which tying may be anticompetitive. These situations occur only under particular circumstances and one would have to verify that those circumstances applied, or were plausible, in a particular case. In the economics literature, though, there is no support for the view that tying is presumptively bad. In fact the literature finds that tying is presumptively good, and the authors of the paper

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[23] *See* David Spector, *Loyalty Rebates: An Assessment of Competition Concerns and a Proposed Structured Rule of Reason*, 1 COMPETITION POL'Y INT'L 89 (2005); Bruce H. Kobayashi, *The Economics of Loyalty Discounts and Antitrust Law in the United States*, 1 COMPETITION POL'Y INT'L 115 (2005). Alberto Heimler, *Below-Cost Pricing and Loyalty-Inducing Discounts: Are They Restrictive and, If So, When?*, 1 COMPETITION POL'Y INT'L 149 (2005).

[24] David Spector, *Loyalty Rebates and Related Pricing Practices: When Should Competition Authorities Worry?*, *in* GLOBAL COMPETITION POLICY: ECONOMIC ISSUES AND IMPACTS (David S. Evans & Jorge Padilla eds. 2004); Jorge Padilla, Rebates: Efficiency v. Foreclosure. An economic commentary. Presented at the UCL Antitrust and Regulation Series (Apr. 26 2005).

that suggests tying might be bad are careful to point out that they have identified special cases.

IV. JEFFERSON PARISH AND AMERICAN TYING LAW

Like many unilateral practices tying has a long and convoluted history in antitrust jurisprudence.

One must go back to 1922 to find the first tying violation under U.S. antitrust law. In *United Shoe Machinery Corp. v. United States* the defendant's leases were found to contain tying restrictions that lessened competition.[25] Although the clauses did not explicitly prohibit the use of a competitor's shoe machine, the practical effect of such clauses effectively restricted using a competitor's shoe-machinery in combination with United Shoe's machines. United Shoe was found to be in violation of Section 3 of the Clayton Act.[26]

A number of significant antitrust cases over the next 62 years found that companies had engaged in *per se* tying violations. The most extreme view of tying expressed on the record was by Justice Frankfurter. He though that "tying arrangements serve hardly any purpose beyond the suppression of competition."[27]

It was against this backdrop of hostility towards tying that the Supreme Court looked at tying in the 1984 *Jefferson Parish* case.

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[25] United Shoe Mach. Corp. v. United States, 258 U.S. 451 (1922); Prior to *United Shoe*, the first tying violation was discussed in *Motion Picture Patents Co. v. Universal Film Manufacturing Co.* in 1917, which overruled *Henry v. A.B. Dick Co.* However, both cases were tried under patent infringement law and not antitrust law. In *Motion Picture Patents*, the patent holder on a movie projector sold projectors to theaters with the agreement that the theaters would only project movies supplied by the plaintiff or its designees. After a theater did not abide by the agreement to only exhibit authorized movies, the plaintiff sued for patent infringement, but the Supreme Court held that movie films were not part of the patented movie projector, and thus, no patent infringement had occurred. *See* Motion Picture Patents Co. v. Universal Film Manufacturing Co., 243 U.S. 502 (1917); Henry v. A.B. Dick Co., 224 U.S. 1 (1912).

[26] Tying was first found to be a violation of Section 1 of the Sherman Act in *International Salt Co. v. United States,* 332 U.S. 392 (1947). The *International Salt Case* focused on a salt company, which was the largest U.S. producer of industrial salt. The salt company owned patents on two salt machines and conditioned the lease of these machines on the requirement that the lessee purchase all salt used in the leased machines from the appellant salt company. The Court held that such a requirement violated Section 1 of the Sherman Act and Section 3 of the Clayton Act because the agreements tended to create a monopoly and because it is per se unreasonable to exclude competition from a substantial market.

[27] Standard Oil Co. v. United States, 337 U.S. 293, 305 (1949).

The historical context of the *Jefferson Parish* decision is worth noting. This 1984 decision occurred seven years after the *Sylvania* decision opened the floodgates of Chicago-influenced reasoning in evaluating antitrust cases.[28] The *Sylvania* decision reversed the long-standing precedent that vertical territorial restraints were a *per se* violation of the antitrust laws. A few years later the scope of the *per se* rule was curtailed even further when in *BMI* the Supreme Court ruled that even some price fixing arrangements may have efficiency justifications which would warrant their analysis under the rule of reason.[29] Then, in *Matsushita* (1986) and *Brooke Group* (1993) the Supreme Court adopted Chicago reasoning in raising the hurdles that plaintiffs faced in bringing, under the rule of reason, predatory pricing cases.[30]

After *Sylvania* the Supreme Court shifted almost all practices except hard-core cartel behavior into the rule of reason category and infused economic analysis into the rule of reason inquiries for virtually all practices. In *Jefferson Parish*, however, the Supreme Court left tying in a peculiar *per se* box in which tying would be automatically condemned if it flunked a new test. Let's take a look at the case.

Jefferson Parish Hospital, outside New Orleans, entered into an exclusive agreement with a group of anesthesiologists to provide anesthesiology services at the hospital. When a doctor scheduled his patient for surgery at the hospital he had to pick—or recommend to the patient—an anesthesiologist from one of these anesthesiologists. A competing group of anesthesiologists claimed that Jefferson Parish Hospital was engaging in an anticompetitive tie in violation of Section 1 of the Sherman Act.

The District Court rejected the *per se* approach in favor of a rule of reason analysis of this case. The lower court ruled the plaintiff could not prevail on a *per se* analysis because he had not made the necessary demonstration that the hospital "dominated" the market for its services. Then, under a rule of reason analysis, the court found that defendant hospital did not violate Section 1 of the Sherman Act by

[28] Continental T.V. v. GTE Sylvania, 433 U.S. 36 (1977).
[29] Broadcast Music, Inc. v. Columbia Broadcasting System, Inc., 441 U.S. 1 (1979).
[30] Matsushita Elec. Industrial Co. v. Zenith Radio, 475 U.S. 574 (1986); Brooke Group v. Brown & Williamson Tobacco Co. 509 U.S. 209 (1993).

excluding Dr. Edwin G. Hyde (plaintiff) from its medical staff because the anticompetitive effects of its closed group policy were few and far outweighed by the many benefits to patient care.[31]

The Court of Appeals for the Fifth Circuit Court reversed the District Court's judgment. It found that a *per se* approach was appropriate for the case. In particular it rejected the hospital's explanation for why the tie led to efficiencies.[32] The Supreme Court agreed to hear an appeal.

The Supreme Court wrestled with what to do about tying. A five-judge majority[33] was troubled by the sweeping condemnation of tying in the previous case law. But the Court was hesitant to overturn such a long-standing body of jurisprudence. Justice Brennan noted in a separate concurring opinion that

> It may, for example, be entirely innocuous that the seller exploits its control over the tying product to 'force' the buyer to purchase the tied product. For when the seller exerts market power only in the tying-product market, it makes no difference to him or his customers whether he exploits that power by raising the price of the tying product or by 'forcing' customers to buy a tied product. On the other hand, tying may make the provision of packages of goods and services more efficient. A tie-in should be condemned only when its anticompetitive impact outweighs its contribution to efficiency.[34]

The majority also noted that, "It is clear, however, that not every refusal to sell two products separately can be said to restrain competition."[35] But "[i]t is far too late in the history of our antitrust jurisprudence to question the proposition that certain tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable '*per se*.'"[36]

The Court came up with a new test that we describe below. Applying this test if found that there was no anticompetitive tie. Justice O'Connor, along with Chief

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[31] Dr. Edwin G. Hyde v. Jefferson Parish Hospital District No. 2, 513 F. Supp. 532 (E.D. La. 1981).
[32] Dr. Edwin G. Hyde v. Jefferson Parish Hospital District No. 2, 686 F.2d 286 (5th Circuit, 1982).
[33] Stevens, J., delivered the opinion of the court, in which Brennan, White, Marshall, and Blackmun, JJ., joined. Brennan, J., filed a concurring opinion, in which Marshall, J., joined.
[34] Jefferson Parish Hospital Dist. No. 2 v. Hyde, 466 U.S. 2, 41 (1984).
[35] *Id.* at 11.
[36] Jefferson Parish Hospital Dist. No. 2 v. Hyde, 466 U.S. 2, 9 (1984).

Justice Burger and Justices Powell and Rehnquist, agreed with the Court's decision to reverse the Appeals Court. But O'Connor argued that the case was properly analyzed under the rule of reason. She noted that "the *per se* label in the tying context has generated more confusion than coherent law because it appears to invite lower courts to omit the analysis of economic circumstances of the tie that has always been a necessary element of tying analysis. The time has therefore come to abandon the 'per se' label and refocus the inquiry on the adverse economic effects, and the potential economic benefits, that the tie may have."[37]

The majority came up with what they saw as a compromise between the draconian view of tying taken by their predecessors and their desire to keep some semblance of a *per se* rule.[38] They found that tying was *per se* illegal if there were two separate products, for which the firm had market power in the tying product, and for which the tie affected a not insubstantial portion of interstate commerce. To determine whether products were separate, the majority decision said that one should look at whether the two products could exist in separate product markets with their own sufficient demand. Specifically, the court stated

> The answer to the question whether petitioners have utilized a tying arrangement must be based on whether there is a possibility that the economic effect of the arrangement is that condemned by the rule against tying – that petitioners have foreclosed competition on the merits in a product market distinct from the market for the tying item. Thus, in this case no tying arrangement can exist unless there is a sufficient demand for the purchase of anesthesiological services separate from hospital services to identify a distinct product market in which it is efficient to offer anesthesiological services separately from hospital services.[39]

Moreover, whether two products are considered separate products is not a function of whether the two products are complements or not. Specifically, the court stated, "Our cases indicate, however, that the answer to the question whether one or two products

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[37] *Id.* at 34-36.
[38] *See* PHILIP E. AREEDA ET AL., ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION 29-33 (Vol. 5, 1996).
[39] Jefferson Parish Hospital Dist. No. 2 v. Hyde, 466 U.S. 222 (1984).

are involved turns not on the functional relation between them, but rather on the character of the demand for the two items."[40]

Applying this test to the facts at hand, the majority decision found that anesthesiology and surgical services were separate products and that there was sufficient demand to offer anesthesiology services separately. But they also found that Jefferson-Parish Hospital lacked market power.

This denouement highlights the peculiarity of the test. On the one hand the majority, following the Appeals Court, seemed to reject various explanations the hospital gave as to why it wanted a dedicated team of anesthesiologists. On the other hand the majority found that the hospital did not have significant market power, which implies that tying could not have been an anticompetitive strategy. Thus the majority was left with no plausible explanation for why the hospital engaged in tying.

V. TYING: POSTER CHILD FOR ANTITRUST MODERNIZATION

As of 2005, very few practices really fall under *per se* condemnation. These include hard-core cartels that fix minimum prices. Since *BMI* it has been possible for groups of firms to persuade the courts to evaluate price fixing under the rule of reason if there is a plausible efficiency explanation. Among unilateral practices, only minimum resale price maintenance is *per se* illegal. In *Sylvania* in 1977 and *Khan* in 1997, the Court reversed earlier decisions in that had treated non-price vertical restraints and maximum resale price maintenance as *per se* illegal.[41]

Jefferson Parish left tying as a rather incompletely evolved species of unilateral practices. The decision made it easier for the defendant to request dismissal of a tying claim than the previous case law. The percentage of tying claims that were dismissed by federal district courts increased significantly in the two decades after *Jefferson Parish* compared to the preceding two decades. So the Supreme Court

[40] *Id.* at 19.
[41] *Id.*; Continental T.V. v. GTE Sylvania, 433 U.S. 36 (1977).

imparted its increasingly skeptical view of the anticompetitive nature of unilateral practices to tying.

Table 2: Outcome of Summary Judgment Motions to Dismiss Tying Claim, 1964 - 2005

	Granted	Denied	% Granted
1964 – 1984 (Pre-Jefferson Parish)	184	46	68.66 %
1984 (Post-Jefferson Parish) - 2005	246	36	80.92%

Note: Ideally we would have liked to examine outcomes of all tying cases in the U.S. Federal District Courts. However, the Lexis database contains only cases in which the court issued an opinion. It does not contain comprehensive information on cases that went to jury trials. The majority of the court opinions we obtained were issued when a party moved for summary judgment. Therefore, we narrowed the cases to those that focused on a motion for summary judgment filed by the defendant.

Tying cases, however, continue apace. Between 2000 and 2005 more than 60 cases involving an antitrust tying claim were filed in federal courts. Indeed, the largest settlement in antitrust history—in the retailers' case against MasterCard and Visa[42]—came on the heels of a District Court decision that found that *Jefferson Parish* was the proper standard. The lower court ruled, as a matter of law, that the card associations failed all of the prongs of the test. It left open the possibility that the plaintiffs had to prove competitive harm to a jury.[43]

U.S. antitrust law has made enormous strides in the last twenty years towards becoming intellectually coherent and based on sound economic analysis. In many ways it has become boring in part because there are relatively few disagreements among economists on the right approach (as distinct form the application to a particular set of facts). Economic analysis now has a preeminent place in evaluating and bringing cases, among enforcement agencies and in the courts. To the extent there is disagreement it surrounds unilateral practices.

[42] In re Visa Check/Mastermoney Antitrust Litigation, 2003 US Dist LEXIS 4965 (ED NY).
[43] Dr. Edwin G. Hyde v. Jefferson Parish Hospital District No. 2, 513 F. Supp. 532 (E.D. La. 1981).

The debate, however, concerning unilateral practices concerns mainly how to conduct the rule of reason analysis. Should the profit-sacrifice test be used to distinguish predatory from non-predatory actions?[44] To what extent should the courts insist on evidence of consumer harm or infer consumer harm from the nature of the practice?[45] Should bundled rebates be subject to a full-blown rule of reason analysis or subjected to something like the *Brooke Group* test?

There is no serious debate that unilateral practices should be subjected to a *per se* test rather than a rule of reason analysis. Likewise, there is no debate among economists or legal scholars that tying should be removed from the genus of unilateral practices and placed in its own leper colony. In the last decade we have identified roughly 100 articles concerning tying in peer-reviewed economics journals and law reviews in the United States. Only one advocated the *per se* treatment of tying.[46] Moreover, not a single economist or antitrust scholar has offered a serious defense of the *Jefferson Parish* test.

More than a quarter century ago Justice O'Connor said

> The time has therefore come to abandon the "per se" label and refocus the inquiry on the adverse economic effects, and the potential economic benefits, that the tie may have. The law of tie-ins will thus be brought into accord with the law applicable to all other allegedly anticompetitive economic arrangements, except those few horizontal or quasi-horizontal restraints that can be said to have no economic justification whatsoever. This change will rationalize rather than abandon tie-in doctrine as it is already applied.[47]

Modern antitrust analysis does not support the *per se* condemnation of tying or the *Jefferson Parish* test. Neither should modern antitrust law. Ending the *per se*

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[44] Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP, 540 U.S. 398 (2004); Einer Elhauge, *Defining Better Monopolization Standards*, 56 STAN. L. Rev. 253 (2003); Barbara Ann White, *Evolving Antitrust Treatment of Dominant Firms: Choosing Among Antitrust Liability Standards Under Incomplete Information: Assessments f and Aversions to the Risk of Being Wrong*, 20 BERKELEY TECH. L.J. 1173 (2005). Douglas Melamed, *Exclusionary Conduct Under the Antitrust Laws: Balancing, Sacrifice, and Refusals to Deal*, 20 BERKELEY TECH. L.J. 1247 (2005); Steven Salop, Section 2, Consumer Welfare Effects, and the Flawed Profit-Sacrifice Standard (May 11, 2005) (unpublished manuscript, on file with author).

[45] Howard Chang, David Evans, & Richard Schmalensee, *Has the Consumer Harm Standard Lost Its Teeth?*, *in* HIGH STAKES ANTITRUST - THE LAST HURRAH?, (Robert W. Hahn, ed. 2003); Timothy Muris, *Principles for a Successful Competition Agency*, 72 U. CHI. L. REV. 165 (2005).

[46] *See* Christopher P. Campbell, *Fit To Be Tied: How United States v. Microsoft Corp. Incorrectly Changed the Standard for Sherman Act Tying Violations Concerning Software*, 22 LOYOLA L.A. ENT. L. REV. 583 (2002).

[47] Jefferson Parish Hospital Dist. No. 2 v. Hyde, 466 U.S. 2, 34-35 (1984).

treatment of tying, and the *Jefferson Parish* compromise, would be a fitting and deserving tribute to Justice O'Connor.