The Futility of Antitrust Attacks on Tie-In Sales: An Economic and Legal Analysis

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The Supreme Court has consistently condemned tying arrangements1 as antitrust violations, primarily on the ground that they serve to extend a seller's monopoly power over the tying product into the tied product market.2 The Court's condemnation is premised on three objections: that tying arrangements (1) foreclose the seller's competitors from opportunities to make sales of the tied product, (2) make entry into the tying or tied product markets more difficult, and (3) displace buyers' freedom of choice by coercing them into purchasing a product that they do not desire.3 These objections have been widely criticized by economists and legal commentators who question the adverse economic effects of tying arrangements.4

We attack the Court's treatment of tying arrangements from a different angle. We assume, for the sake of argument, that the Court's economic assumptions concerning the effects of tying arrangements are sound. We then demonstrate that commonly used, legal alternative pricing strategies can generate profits approximating those available through

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1. The Supreme Court defines a tying arrangement as "an agreement by a party to sell one product [the tying 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." Northern Pac. Ry. Co. v. United States, 356 U.S. 1, 5-6 (1958).

2. See infra notes 15-16 & accompanying text.

3. See infra notes 15-30 & accompanying text.

4. See infra notes 42-85 & accompanying text.
illegal tie-ins.\textsuperscript{5} This result contradicts the Court's implicit assumption that the prohibition of tying arrangements forces firms to return to a competitive market solution. Little is gained, then, by prohibiting tying arrangements, and the cost of enforcing the prohibition may well exceed any resulting benefits.

The Article first presents the traditional legal and economic analysis reflected in the Supreme Court's treatment of tying arrangements, as well as the widely accepted economic criticisms of this view. It then presents an economic model of the alternative pricing strategy we have in mind: a nonlinear pricing strategy, achieved through a particular form of product bundling. We show that by allowing buyers to choose between purchasing the tied good at a competitive price and purchasing a bundle of both the tying and tied good at a price that supplies their desired amount of the tied good, sellers can earn profits approaching those which can be earned through a coercive tying arrangement. We further demonstrate some positive consumer welfare effects of this strategy. We then show that this non-coercive bundling strategy is free from antitrust liability. We conclude that the current per se prohibition of tying arrangements should be abandoned because, even if the Court is correct about the economic effects of such practices, the benefit from forcing firms to shift from coercive tie-ins to this alternative pricing strategy is small and does not justify the cost of enforcing the prohibition. We advocate a rule of reason approach that presumes legality, thus prohibiting tying arrangements only in those few cases in which the arrangements have a deleterious effect on consumer welfare.

The Conventional Wisdom: Law and Economics

Legal Analysis of Tying Arrangements

Tying arrangements typically are challenged under either section 1 of the Sherman Act\textsuperscript{6} or section 3 of the Clayton Act.\textsuperscript{7} An examination of

\textsuperscript{5} Tie-ins continue to exist, of course, because their purpose is not merely to generate profits through increased sales of the tied product. They are often used, for example, to monitor the use of the tying product and to increase its effective price to high intensity users, who value it more highly. See infra notes 74-85 & accompanying text. These uses have little, if anything, to do with market extension. \textit{Id.}

\textsuperscript{6} 15 U.S.C. § 1 (1982) (providing in part: "Every contract, combination, in the form of trust or otherwise, or conspiracy in restraint of trade or commerce among the several States, or with foreign nations is declared to be illegal.").

\textsuperscript{7} 15 U.S.C. § 14 (1982) (providing: It shall be unlawful for any person engaged in commerce, in the course of such commerce, to lease or make a sale or contract for sale of goods, wares, merchandise, machinery, supplies, or other commodities, whether patented or unpatented, . . . on
the case law associated with these challenges reveals the evolution and refinement of a legal analysis that involves a consideration of three factors: first, the existence of two distinct and separable products, with the

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8. The legality of tying arrangements was first considered in the context of patent infringement actions. In the typical suit, a patentee who practiced tying would sue a competing manufacturer of the tied good, and the manufacturer would assert as a defense to the action that the patentee's tying arrangement was illegal under the Sherman Act. However, the Sherman Act was held to offer no defense to the action. Henry v. A.B. Dick Co., 224 U.S. 1 (1912); Heaton-Peninsular Button-Fastener Co. v. Eureka Specialty Co., 77 F. 288 (6th Cir. 1896).

The passage of the Clayton Act reversed that trend.

One commentator has suggested that Henry v. A. B. Dick Co. provided the legislative initiative for § 3 of the Clayton Act. See L. SULLIVAN, HANDBOOK OF THE LAW OF ANTITRUST 432-33 (1977). Since the passage of the Clayton Act, the Court, for equitable reasons, has denied a patentee relief for infringement where it has found that the patentee, through tying, was attempting to extend its monopoly power into new markets. See, e.g., Morton Salt Co. v. G.S. Suppiger Co., 314 U.S. 488 (1942); Carbice Corp. v. American Patents Dev. Corp., 283 U.S. 27 (1931).

9. The products are often either complements or substitutes. Two products are complementary when an increase in the demand for one will lead to an increase in the demand for the other. Alternatively stated, two products are said to be complements when a decrease in the price of one increases the quantity consumed of both products. Two products are substitutes when a decrease in the price of one good results in an increase in the quantity consumed of that good, but a decrease in the amount consumed of the other good. Common examples are tennis rackets and tennis balls (complements), and butter and margarine (substitutes).

The initial determination of whether there indeed is a tying arrangement—specifically, whether there are two products that are being sold in one "package"—is referred to as the "existence" question. See Bauer, A Simplified Approach to Tying Arrangements: A Legal and Economic Analysis, 33 VAND. L. REV. 283, 305-08 (1980). Judge Posner makes an interesting observation concerning this requirement:

[A] . . . serious problem arises from the fact that . . . the concept of a tie-in is conventional rather than analytical. We think of a mimeograph machine and its paper and ink as separate products which if sold together are "tied," but we do not think of a left and right glove, or an automobile and its radiator, in the same way. Yet nothing in the traditional legal thinking about tie-ins enables one to distinguish among these cases. The tie-in doctrine furnishes no answer to the question of when a sale consists of a combination of separate products or when it is a single product
seller conditioning the sale of one product on the purchase of the other;\textsuperscript{10} second, the seller’s possession of considerable economic power in the tying product market;\textsuperscript{11} and third, the arrangement’s effect on a “not insubstantial” volume of commerce.\textsuperscript{12} Generally, a Sherman Act violation is shown only if all three of these factors are established,\textsuperscript{13} whereas the Clayton Act requires only the first plus either of the other two factors.\textsuperscript{14}

This legal analysis reflects and is based upon the Supreme Court’s view that tying arrangements involve the exercise and extension of market power.\textsuperscript{15} The Court has objected to tying arrangements on the basis made up of components. Since virtually all products have components, the potential reach of the doctrine is thus devastating. I suppose that what keeps the doctrine from expanding to its logical limits is a tacit assumption that the more obvious combination sales could readily be justified by their lower costs compared to selling the components separately. But there is something seriously wrong about a doctrine under which virtually every combination sale is prima facie an unlawful tie-in that the seller may have to convince a jury is cost justified.


Patents have been used to establish market power in the tying product market in many leading tie-in cases. See, e.g., International Salt Co. v. United States, 332 U.S. 392 (1947); IBM v. United States, 298 U.S. 131 (1936). Posner criticizes this role of patents in tie-in cases. See R. Posner, supra note 9, at 173 n.4 (1976).


13. Id. at 1560-61; Times-Picayune Publishing Co. v. United States, 345 U.S. 594, 608-09 (1953).


15. See id. at 611 ("[T]he essence of illegality in tying agreements is the wielding of monopolistic leverage; a seller exploits his dominant position in one market to expand his empire into the next."). Standard Oil Co. v. United States, 337 U.S. 293, 305-06 (1949) ("[T]ying agreements serve hardly any purpose beyond the suppression of competition.")

One noted authority states: "The consistent judicial instinct has been that these arrangements have but a single purpose and effect, to extend the seller’s power in the market for the tying product into that for the tied product.” L. Sullivan, supra note 8, at 431.

This traditional view is reflected in a number of commentaries. See, e.g., Austin, The Tying Arrangement: A Critique and Some New Thoughts, 1967 Wis. L. Rev. 88, 89; Bauer, supra note 9, at 298; Lockhart & Sacks, The Relevance of Economic Factors in Determining Whether Exclusive Arrangements Violate Section 3 of the Clayton Act, 65 Harv. L. Rev. 913, 944 n.95 (1952); Slawson, supra note 11, at 677-84; Turner, The Validity of Tying Arrange-
of three theories about the alleged adverse effects of tying: that tying arrangements may (1) foreclose competition in the tied product market; (2) create barriers to entry in either the tying or tied product market; and (3) coerce buyers.

The theory that tying arrangements foreclose competition in the tied product market is based on the notion that the seller of the tying product is using its power in the tying product market to make sales of the tied product that it would not otherwise have made. Thus, the buyer, who needs to obtain the tying product from the tie-in seller, is "forced" to take the tied product from the same source, even though the buyer might otherwise have gone elsewhere for various reasons. By "restraining" competition on the merits in this way, the tying arrangement allegedly forecloses competitors from opportunities to make sales of the tied product.

The foreclosure theory has provided the primary impetus for the Supreme Court's development of a per se rule of illegality with respect to tying arrangements. Perhaps the most famous statement of the rule in this regard is found in *International Salt Co. v. United States.* The court, holding that the defendant's practice of tying a requirements contract for the sale of rock salt to a lease of its patented salt processing machine was illegal, stated that it was "unreasonable, per se, to foreclose competitors from any substantial market. . . . The volume of business affected by these contracts cannot be said to be insignificant or insubstantial and the tendency of the arrangement to the accomplishment of monopoly seems obvious." This and several other cases demonstrate the Court's concern that tying arrangements are vehicles for expanding monopoly power from the tying product market to the tied product market through the foreclosure of competitors in the latter market. The wisdom of this analysis, and the plausibility of its assumptions, have been

16. The Court views this as the traditional objection to tie-ins. See Northern Pac. Ry. Co. v. United States, 356 U.S. 1, 6 (1958); R. POSNER, supra note 9, at 171-72; Note, supra note 15, at 91-94.
17. This need results from the lack of competition in the tying product's market.
18. The "forcing" with which tying doctrine is concerned is discussed infra at notes 30-41 & accompanying text.
19. These reasons might include lower price or higher quality.
22. Id. at 396.
23. See, e.g., Fortner Enters., Inc. v. United States Steel, 394 U.S. 495, 504-06 (1969);
seriously questioned. Nevertheless, the Court has recently demonstrated its continuing adherence to the foreclosure theory of tying arrangements, and it has reaffirmed, by a narrow margin, the application of the per se rule to tying arrangements on the basis of this objection.

The Court also has voiced, at various times, other objections to tying arrangements. The most significant of these is that tying arrangements create obstacles to the entry of potential competitors into the tying or the tied product market. These barriers to entry allegedly arise because the tie-ins force potential entrants to enter both markets at the same time, which presumably is riskier and more difficult than entering only one market.

The barriers to entry objection to tie-ins was articulated in United Shoe Machinery Corp. v. United States. The defendant, which controlled over ninety-five percent of the shoe machinery market, refused to lease its shoe machinery unless the lessee also agreed to purchase supplies from the defendant-lesser. The government argued that a new competitor in the supplies market would be foreclosed from ninety-five percent of that market. Thus, an entrant who sought to compete in the supplies market would also have to enter the shoe machinery market, but entry would be hindered by United Shoe's well-established position. The Court concluded that the total impact of the tying arrangement was to insulate the seller from the threat of new entry in either market, and the arrangement was held illegal.

The Court's third objection, that tying arrangements coerce buyers, has been an issue in many tying arrangement cases. At times the Court has seemed to treat coercion as an independent objection to tie-ins, a seemingly populist notion which is based on the displacement of the buyer's freedom of choice. More often, however, coercion is treated as an issue in determining whether adverse economic effects—either foreclosure or barriers to entry—can be presumed to result from a challenged

24. See infra notes 42-85 & accompanying text.
25. See Jefferson Parish Hosp., 104 S. Ct. 1551; infra notes 31-41 & accompanying text.
27. 258 U.S. 451 (1922); see also Atlantic Ref. Co. v. FTC, 381 U.S. 357, 371 (1965).
28. 258 U.S. at 455-57.
29. Id. at 457-58.
tying practice. The Court’s most recent tying arrangement decision, Jefferson Parish Hospital District No. 2 v. Hyde,\(^{31}\) reflects this latter view.

Jefferson Parish Hospital involved an exclusive contract between a hospital and a firm of anesthesiologists, requiring all anesthesiological services for the hospital's patients to be performed by that firm.\(^{32}\) An anesthesiologist, who was not a member of either the firm or the hospital’s staff, brought suit alleging that the contract violated section 1 of the Sherman Act.\(^{33}\) The plaintiff’s theory was that the contract was an illegal tying arrangement because users of the hospital’s operating rooms (the tying product) were compelled to purchase the hospital’s chosen anesthesiological services (the tied product), the hospital possessed sufficient market power in the tying product market to coerce purchasers of the tied product, and the arrangement affected a “not insubstantial amount of interstate commerce.”\(^{34}\)

The District Court found that the anticompetitive consequences of the contract were minimal and were outweighed by benefits in the form of improved patient care.\(^{35}\) The Court of Appeals, however, accepted the plaintiff's arguments and reversed the lower court, declaring the contract illegal per se.\(^{36}\) The Supreme Court granted certiorari and reversed, refusing to apply the per se rule because of insufficient evidence to support a finding of sufficient market power in the tying product.\(^{37}\)

The Court’s decision defined coercion and clarified its role in tying arrangement analysis. After finding that the contract in question required the purchase of two distinguishable services,\(^{38}\) the Court explained that the analysis must proceed further before per se liability could be found: “Only if patients are forced to purchase [the tied anesthesiological] services as a result of the hospital’s market power would the arrangement have anticompetitive consequences.”\(^{39}\) Thus, coercion is relevant only as an element that must be shown to find illegality per se, and this illegality is based on economic considerations. Also, the “forcing” that constitutes coercion in the relevant sense can only arise when

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32. Id. at 1554-55.
33. Id. at 1554.
34. The Court of Appeals found the tying arrangement illegal on this basis. Id. at 1556.
37. 104 S. Ct. at 1566-67. The Court also held that the plaintiff could not prevail in the absence of per se illegality, because there was insufficient evidence that this particular contract unreasonably restrained competition. Id. at 1567-69.
38. Id. at 1561-65; see supra notes 9-10 & accompanying text.
39. 104 S. Ct. at 1565.
the seller has market power in the tying product market.\textsuperscript{40}

Four justices, while concurring in the result in \textit{Jefferson Parish Hospital}, called for the abandonment of the per se rule against tying arrangements. In an opinion by Justice O'Connor, they argued that the current "elaborate inquiry into the economic effects of the tying arrangement" is more appropriate to a rule of reason analysis, which more accurately assesses the economic impact of a given tie-in.\textsuperscript{41}

The Court's distrust of tying arrangements, based on economic objections and alleged anticompetitive effects, may be misplaced. Many economists and antitrust lawyers have long questioned the plausibility of the Court's economic theories concerning tie-ins and have urged a rule of reason approach. As evidenced by the split in the \textit{Jefferson Parish Hospital} case, the Court soon may be ready to heed this call. For this reason, a reconsideration of various economic critiques is in order.

\textbf{Economic Analysis of Tying Arrangements}

Because the Court's treatment of tying arrangements usually focuses chiefly on the foreclosure objection, economic criticism of the Court's treatment is most often directed at this theory. The other theories, however, have not gone uncriticized.

Coercion of consumers is rarely addressed by economists as an independent objection to tying arrangements. Perhaps this is because the Court has only occasionally articulated the coercion issue as an independent consideration.\textsuperscript{42} More likely it is because economists tend to

\textsuperscript{40} The Court dismissed the argument that "market imperfections" other than market power resulted in the necessary kind of coercion. \textit{Id.} at 1566-67.

\textsuperscript{41} Justice O'Connor wrote:

The Court has never been willing to say of tying arrangements . . . that they are always illegal, without proof of market power or anticompetitive effect.

The "\textit{per se}" doctrine in tying cases has thus always required an elaborate inquiry into the economic effects of the tying arrangement. As a result, the tying doctrine incurs the costs of 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. Moreover, the \textit{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 "\textit{per se}" label and refocus the inquiry on the adverse economic effects, and the potential economic benefits, that the tie may have . . . . This change will rationalize rather than abandon tie-in doctrine as it is already applied.

\textit{Id.} at 1570 (footnote omitted).

\textsuperscript{42} See \textit{supra} notes 30-31 & accompanying text.
downplay power relationships in voluntary contracts, viewing tying arrangements merely as “equivalent to a price increase in many cases” and the focus on consumer choice as “misdirected and misleading.”

The barriers to entry theory has been criticized on several grounds. Some economists believe that if capital markets are efficient, then a firm can use tying arrangements to deter entry only if such arrangements entail lower costs. Then the tying arrangement may well be socially desirable.

Another criticism of the theory has been that entry into the tied product market by a lower-cost manufacturer would not be deterred by the tie-in arrangement. In that event, the tying product monopolist would be inclined to buy the tied product from the lower cost manufacturer and to resell it to the tie-in buyer. If the monopolist, in an effort to impede entry into the tying product market, refuses to buy and resell the tied product to the tie-in buyer, the existence of competitors in the tied product market generally will inhibit the success of the tying strategy.

As the preceding legal analysis indicates, the Court has viewed tying arrangements primarily, and at times exclusively, as a lever for extending market power from one market to another. In contrast, many economists view leverage as rarely or never a plausible motive for tie-ins. At least one prominent commentator has argued that a tying product monopolist has no incentive to monopolize a complementary product market. Because the products are used in conjunction with one another, he argues the maximum monopoly profits available can be extracted from a single monopoly position. Many economists have argued that price discrimination is the primary motivation for tie-ins.

43. Blair & Finci, supra note 30, at 555; see also supra note 55.
45. R. Posner, supra note 9, at 176.
47. Complementarity of products is defined supra note 9. A more technical definition is given infra note 58. Tying arrangements involving complementary products are the most common type and have the most potential for involving leverage. See infra notes 82-85 & accompanying text.
48. R. Posner, supra note 9, at 173-74. Profits could be increased if the monopolist were acquiring the second monopoly in order to price discriminate. Id. This use of a tying arrangement, however, has nothing to do with monopoly extension. See infra notes 65-66 & accompanying text.
49. See Bowman, Tying Arrangements and the Leverage Problem, 67 Yale L.J. 19, 20 (1957); Burstein, The Economics of Tie-In Sales, 42 Rev. Econ. & Stat. 68 (1960) [hereinafter cited as Burstein, Tie-In Sales]; Burstein, A Theory of Full-Line Forcing, 55 Nw. U.L. Rev. 62 (1960) [hereinafter cited as Burstein, Full-Line Forcing]. For a discussion of why the re-
It is necessary at this point to distinguish between two possible senses in which one might use the term "leverage."\textsuperscript{50} A revenue-maximizing device, which is only a means of better utilizing existing market power to increase profits, might be called a leverage device. Price discrimination is a good example of this type of behavior.\textsuperscript{51} The term "leverage" may also be used to describe a monopoly-creating, or monopoly-extending, device which actually increases the amount of monopoly power in some way.\textsuperscript{52} It is this latter sense of leverage with which the Court's foreclosure theory of tying arrangements is concerned: the Court's treatment assumes that monopoly power can be created or extended by tying.\textsuperscript{53} For this reason, and unless otherwise indicated, we placement of leverage theory by price discrimination theory has failed to have a discernible impact on public policy, see \textit{R. Posner, supra} note 9, at 174-77. Economists have more recently identified several other reasons for the existence of tie-ins. \textit{See infra} notes 69-70 \& accompanying text. \textit{See generally} Edwards, \textit{The Economics of “Tying” Arrangements: Some Proposed Guidelines for Bank Holding-Company Regulation}, 6 \textit{Antitrust L. \& Econ. Rev.} 87 (1973); Hovenkamp, \textit{Tying Arrangements and Class Actions}, 36 \textit{Vand. L. Rev.} 213, 227-59 (1983).

50. The distinction appears in an influential article by Professor Bowman. \textit{See Bowman, supra} note 49, at 19.

51. Considering tie-ins as a form of price discrimination rather than as a monopoly-creating device does not automatically establish that they ought to be permitted. \textit{R. Posner, supra} note 9, at 177-80.

52. Many economists argue that tie-ins rarely can be used as a monopoly-creating device. \textit{See, e.g., R. Bork, supra} note 44, at 365-81; \textit{R. Posner, supra} note 9, at 171-84; Baldwin \& McFarland, \textit{Tying Arrangements in Law and Economics}, 8 \textit{Antitrust Bull.} 743, 766, 778 (1963); Bowman, \textit{supra} note 49; Burstein, \textit{Tie-in Sales, supra} note 49.

53. In practice, the Court has had difficulty making this distinction. For example, the Court's initial adoption of the monopoly extension argument involved the use of a tying arrangement to capture monopoly profits on the patented tying product. In Motion Picture Patents Co. v. Universal Film Mfg. Co., 243 U.S. 502 (1917), the Court refused to enforce a contract clause that required movie exhibitors to use patented movie projectors manufactured by the licensor of the movies. The Court reasoned that to allow a movie projector patentee to tie movies would "create a monopoly in the manufacture and use of moving picture films." \textit{Id.} at 518. Such restrictions were held unenforceable under the patent laws and the Clayton Act. The plaintiff had argued that the tie enabled it to earn its patent profit from the film rather than from the patented projectors, i.e., that tying was revenue-maximizing rather than monopoly-creating. \textit{Id.} at 516-17. The Court, however, viewed this defense as further evidence of the patentee's monopoly extension.

The Court may now be ready to make this distinction. In \textit{Jefferson Parish Hospital}, Justice Stevens, writing for the majority, stated:

[T]he law draws a distinction between the exploitation of market power by merely enhancing the price of the tying product, on the one hand, and by attempting to impose restraints on competition in the market for a tied product, on the other. \textit{When the seller's power is just used to maximize its return in the tying product market, where presumably its product enjoys some justifiable advantage over its competitors, the competitive ideal of the Sherman Act is not necessarily compromised. But if that power is used to impair competition on the merits in another market, a potentially inferior product may be insulated from competitive pressures.}
will use the term leverage in this way, that is, tying for leverage is an attempt to extend monopoly power. In assessing the plausibility of the Court's foreclosure theory, the question is whether leverage can be accomplished by the use of a tying arrangement.

Economic concern with the alleged monopoly-creating aspects of tying is necessarily related to the more general economic problem of market power. Market power exists when a firm can raise the price of its

104 S. Ct. at 1559 (emphasis added).

54. Professors Areeda and Turner define "leverage" as "a supplier's power to induce his customer for one product to buy a second product from him that would not otherwise be purchased solely on the merit of that second product." P. AREEDA & D. TURNER, ANTITRUST LAW ¶ 1134a (1980). This definition clearly relates to the coercive aspects of tie-ins; in the analysis in the text that follows, we define leverage in a way that goes to the heart of economic analysis—the allocation of resources—and that is less concerned with the power relationships between buyers and sellers.

55. Leverage, or monopoly power in general, is an important issue in tying arrangements because it is related to the efficient allocation of resources. Monopoly is inefficient if it causes too little output to be produced at too high a price, i.e., society's resources are under-allocated to the production of the monopolist's output. To demonstrate the concept of allocative efficiency, assume that the value consumers place on each unit of good A is reflected by the demand curve $D_A$ in the graph.

For example, the value of the 10th unit produced is $4. Let the cost per unit of producing A be constant at $4 as represented on the graph by the cost curve $C_A$. The perfectly competitive output is 10 units, which is allocatively efficient because the value to society of the last unit produced ($4) is exactly equal to the cost of the resources used to produce that unit. If a tying arrangement created leverage that allowed the firm to gain some monopoly power and thus
product without losing all of its sales. Because a firm with market power, such as a monopolist, faces a downward sloping demand curve, price can only be increased by restricting output relative to what a perfectly competitive market would produce. Thus, if the monopolist produces good A and ties it to good B, which is produced in a competitive market, leverage can be said to occur in market B only if tying causes the total amount of B sold to decrease. To illustrate, let \( B^* \) be the amount of B sold in a perfectly competitive equilibrium before any tying occurs; let \( B_m \) be the amount of B tied to good A and sold by the monopolist, and let \( B_c \) be the amount of B sold by competitive firms after the monopolist in A has made the tie-in. The monopolist has leverage if and only if the total amount of B sold after tying is less than the total amount sold before tying, i.e., if \( B_m + B_c < B^* \).

In determining whether leverage can be accomplished through tying arrangements, we will now distinguish among several economic situations in which tying might occur and identify the economic motives for tying that operate in each situation. We distinguish between goods that are independent in demand, such as salt and coffee, the price of one having no noticeable effect on the demand for the other, and goods with interdependent demands, such as punch cards and card reading machines, the demand for one being closely related to the price of the other. It will also be important to distinguish between cases in which
decrease the output of A by two units without a competitor being able to replace those two units, then total output would be 8 units and the price would be $6. Because the value to society of the ninth unit is shown by the demand curve to be $5 and the cost of producing that unit is only $4, efficiency dictates that the ninth (and tenth) units should be produced. The monopolist’s failure to produce those units is said to be allocatively inefficient; it is producing too little output in order to obtain a higher price. The question of allocative efficiency centers not on the price charged, but rather on the total output produced in the market. Therefore, total output is the criterion by which we will judge tying arrangements to determine whether or not leverage exists; leverage exists if output after a tie-in is less than output that would be produced in a competitive market.

Using the same notion of allocative efficiency, the legal concepts of foreclosure and coercion are economically important only to the extent that output is affected. For example, if foreclosure only means that a given amount of a product is produced by firm 2 instead of firm 1, then allocative efficiency is not affected, because total output has not changed. (This assumes that both firms would produce the good at the same cost.) Similarly, coercion to buy a product that consumers do not desire, or which they desire to buy from another vendor, only affects allocative efficiency to the extent that total output is affected.

56. Downward sloping demand means that price and quantity are inversely related; when price increases the amount demanded will decrease, and when a firm increases output, the only way that output can be sold is by lowering price. In contrast, a perfectly competitive firm faces a horizontal demand curve. See infra note 59.

57. See supra note 55.

58. Demand dependence can be defined in terms of the cross-price elasticity of demand \( \eta_{A,B} \) which is defined as
goods are tied in fixed proportions, where one unit of A is tied to a constant quantity of B, and cases in which goods are tied in variable proportions, where different consumers may use differing amounts of B with a single unit of A.

_Tying When Goods Have Independent Demands_

Let us begin by examining the reasoning behind the leverage argument in the simplest case of goods with independent demands and fixed proportion tying. The argument maintains that if a monopolistic producer of product A ties the purchase of A to the purchase of product B, which is sold in a competitive market, and also raises the price of B and then sells a positive amount of B, the firm must have gained some monopoly power in market B. If a competitive firm were to raise the price of B, all of its customers would abandon it for lower priced sellers; because this does not happen to the monopolist, leverage is assumed.

In fact, when goods having independent demands are sold in fixed proportions, leverage cannot occur for the following reasons: The firm, a monopolist in market A, faces a demand for A, depicted by $D_A$ in Figure 1, that is downward sloping. Because market B is competitive, however, the firm faces a horizontal demand curve at the market price $P_B$ of $2.5\text{.}$

If the monopolist tied one unit of B to one unit of A, and charged a price of $4$ for A and $3$ for B, the total sales would be exactly the same as if it charged $5$ for A and $2$ for B. The effective price of the bundle is $7$ in either case. Because consumers can always buy B for $2$, they will subtract $2$ from the price of A and purchase the bundle only if good A is worth at least $5$ to them. Thus, when A and B are tied, raising the price charged for B effectively is equivalent to raising the price of A.

\[
\eta_{A, B} = \frac{\% \Delta A}{\% \Delta P_B} = \frac{\Delta A}{\Delta P_B} \cdot \frac{P_B}{A}
\]

and measures the effect of a change in the price of good B on the demand for good A. Thus, if $\eta_{A, B} = 0$ the demands are independent; if $\eta_{A, B} \neq 0$, the demands are interdependent. Specifically, if $\eta_{A, B} > 0$ the goods are said to be substitutes and if $\eta_{A, B} < 0$ the goods are said to be complements.

59. A horizontal demand implies that the firm cannot affect the market price by manipulating its own output. Because of the availability of products from other competitive firms that consumers regard as perfect substitutes, an output reduction by one firm will neither decrease the overall supply nor increase the market price.

60. See generally Pearson, _Tying Arrangements and Antitrust Policy_, 60 Nw. U.L. Rev. 626, 632-34 (1965). Accordingly, $D_{A+B}$, the demand for the tied bundle A + B in Figure 1, will be the vertical sum of $D_A$ and $D_B$. This result presumes that every consumer would have purchased at least one unit of good B at $P_B = 2$. If this were not true, then the total quantity demanded of B might rise, but certainly would not fall.
The availability of B at $2 from other sources guarantees that the tying arrangement cannot raise the effective price of B. Changes in the price of the bundle of goods can only affect the effective price and the quantity demanded of good A; the total amount of B sold will not change. Hence, there is no leverage.

If, as the above analysis indicates, tying does not facilitate the exten-
sion of monopoly power when goods have independent demands, why
would tying occur in this context? Perhaps because it facilitates "lever-
age" in its other sense, that is, tying may be a revenue-maximizing device
for better utilization of existing market power to increase profits.61 But
price discrimination is the usual device to accomplish this type of "lever-
age,"62 and commentators have shown that tying generally is not a profit-
able means of price discrimination when demands are independent.63 An
exception to this general rule occurs, however, when a monopolist is able
to use a tying arrangement to present the consumer with an all-or-noth-
ing offer.64 In this case, tying may increase profits from existing monop-
oly power through price discrimination; however, it still will not result in
leverage, that is, the transfer of monopoly power to the tied product
market.

The all-or-nothing offer is illustrated in Figure 2, showing the de-
mand curve of a particular consumer of good $A'$ which is produced by a
monopolist. If the monopolist charges price $P_A$, the consumer will buy
$A'$ units. The market value for these units is defined by the area $CBA'O$
under the demand curve.65 The consumer's total expenditures for $A$
equal $P_A \times A'$, which can be represented as $P_A'B'A'O$ on the graph. The
difference between what the consumer thinks $A'$ is worth and what he
actually has to pay for it is the triangle $CBP_A$. The area of this triangle is
called "consumer surplus." Assume $P_A = $11, $A' = 20$ units, and
$CBP_A = $50; the consumer will spend $20 \times 11 = $220$ on $A'$. If we
assume that total value to the consumer of 20 units of $A$ is $270$, then
consumer surplus is $50$. If the monopolist can force the consumer to
choose between 20 units of $A$ for $269$ or none at all, the consumer
would accept this "all-or-nothing" offer and the monopolist would cap-
ture all but $1$ of the consumer surplus as profit.66

61. See supra notes 50-51 & accompanying text. The point here is that the monopolist
may be able to increase profits from sales of $A$ over what they would be under single monopoly
pricing. See infra note 67.

62. This is using "leverage" in the profit-maximizing sense.

63. See Schmalensee, Commodity Bundling by a Single-Product Monopolist, 25 J.L. &
ECON. 67 (1982); Smaistrla, supra note 48, at 915-17. Schmalensee shows that when demand is
independent and there are fixed proportions, tying will be less profitable than selling the prod-
ucts separately. He does find that "mixed bundling," selling good $x$ at price $p_x$, good $y$ at price
$p_y$, and the bundle at a price $p_b < p_x + p_y$ is a profitable type of price discrimination, but this
resembles nonlinear pricing (with fixed proportions), see infra notes 86-119 & accompanying
text, more than tying.

64. This is the situation described in detail by Burstein, Tie-in Sales, supra note 49.

65. This definition assumes that there are no income effects.

66. Smaistrla has correctly pointed out that actually making a tying agreement into an
all-or-nothing offer is quite difficult, and if the decision of how many units of good $A$ to buy is
The consumer surplus that cannot be extracted by simply raising the price of good A can in principle be captured by the all-or-nothing offer. Suppose the consumer, whose demand for A is depicted in Figure 2, is planning to purchase exactly one unit of good B at the competitive price \( (P_B^*) \) of $30 and that the per unit cost of B is also $30. Assume the monopolist ties the two goods so that A cannot be purchased without purchasing B, continues to charge $11 for A, but charges $40 for B, a

affected by the tie-in, as it would be if the consumer had to purchase some fixed proportion of good B with each unit of A, then this analysis no longer holds. Smaistrla, supra note 48, at 916.

67. Note that when the firm charged a price of \( P_A = $11 \), without the all-or-nothing offer, revenues were \( 20 \times $11 = $220 \). If the firm raised the price to $12, then the quantity sold would fall to 16 units—due to the downward sloping demand—and revenues would fall to \( 16 \times $12 = $192 \). Clearly, the $270 of consumer surplus cannot be captured in this manner. Under some circumstances, however, this surplus—or at least part of it—can be captured by tying as explained in the text.
price that is $10 higher than the competitive price. The consumer will still purchase one unit of B and 20 units of A because the total price for the package does not exceed the total value the consumer attaches to it: \(220 + 40 < 270 + 30\). The extra $10 paid for good B is just the price the consumer is willing to pay to have the opportunity to buy good A. After subtracting the cost of good B, the monopolist will net $230. In this way the tie-in is used to extract $10 worth of consumer surplus available in market A. It is important to keep in mind that the quantity of good B purchased has not changed, so leverage has not occurred. All that has happened is that the monopolist has used the tie-in to better utilize existing market power over good A.^{68}

There are also some special cases in which it will be profitable to tie goods that are independent in demand; for example, if governmental price controls on the monopolized tying good artificially hold down its price.^{69} The tied good is sold at a price above the competitive price, but the quantity sold does not decrease. Consumers, willing to pay more for the tying good than they were paying before the tie-in, also are willing to pay more for the package. This arrangement has nothing to do with leverage; it only serves to extract monopoly profits available for the tying good, and there is no decrease in the total quantity of the tied product sold.^{70}

Thus, tying goods with independent demands, in fixed proportions, does not result in leverage in the relevant sense of extending monopoly power into another product market. In some cases, however, it may serve to enhance a monopolist's ability to extract the profits available due to an existing monopoly. Some have suggested that tying in this context may also be used to monitor collusive agreements among oligopolists, but this also has nothing to do with leverage.^{71}

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^{68}. Interestingly, this type of tie-in is economically equivalent to a two-part tariff in which a consumer pays an entry fee—in this case the price of good B—before purchases of good A can be made at price \(P_A\) per unit. Two-part tariffs are a form of price discrimination. See Oi, A Disneyland Dilemma: Two Part Tariffs for a Mickey Mouse Monopoly, 85 Q.J. ECON. 77 (1971); see also Burstein, Tie-in Sales, supra note 49 (showing that these tie-ins are a means of price discrimination).

^{69}. See, e.g., Coffin-Redington Co. v. Porter, 156 F.2d 113 (9th Cir. 1946); see also F. Scherer, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 583 (2d ed. 1980). It is unlikely that a court would accept such a business justification. For a discussion of the inherent conflict between government regulations and antitrust, see Easterbrook, Antitrust and the Economics of Federalism, 26 J.L. & ECON. 23 (1983).

^{70}. See Smaistrla, supra note 48, at 912 (identifying another case in which a firm used a tie-in to exercise indirectly its monopoly of a patented good).

So far, we have considered only goods that are tied in fixed proportions. In contrast, if good A can be tied to varying amounts of good B, then an increase in the price of good B will affect the consumer's decision about how much of B to consume. For example, if coffee were tied to salt and the price of coffee increased over the competitive price, then the tie-in might operate as a form of price discrimination in the way described above, but it would also cause the consumer to purchase less coffee because the effective price per pound is higher. In this case, leverage has occurred. It is incidental, however, to the main goal of price discrimination, and the net effect on welfare is ambiguous and may even be positive if the price of good A is lower.

Tying When Goods Have Interdependent Demands

When products with interdependent demands are tied in variable proportions, there are several possible explanations for tying. Such tying often occurs when two complementary products are sold together under a requirements contract in which a variable quantity of the tied good is purchased along with one unit of the tying good. The quantity of the tied good that the buyer requires, and therefore purchases, varies with the intensity of his use of the tying good.

Most explanations for tying in this context center around the concept of "metering." When consumers differ in the amount of the tied good they combine with the tying product, each consumer's intensity of consumption is metered by the tie-in. The most common explanation of these tying arrangements is that the seller is engaging in price discrimination. Those who consume large quantities of the tied good may have a lower elasticity of demand for the tying good than do consumers who use less of the tied good. If this is so, then the monopolist may want to charge heavy users a higher overall price for the tied good. This is accomplished by selling the tying good at a relatively low price and the tied good substantially above the price at which it would be sold in a competitive market. Low intensity users, who consume less of the tied product, will still purchase the package. The monopolist can retain these sales, while extracting larger profits from high intensity users who are, in effect,
paying more for the package than low intensity users.\textsuperscript{75}

\textit{International Business Machines \textit{v. United States\textsuperscript{76} involved a classic example of this use of a tying arrangement. Computers, the monopolized tying product, were rented at a relatively low price, and tabulating cards, the tied product, were sold at a substantial markup above marginal cost. In effect, the above-normal profits earned in the tied product market were the result of monopolistic price discrimination in the tying product market.\textsuperscript{77} Another example of this type of tying arrangement is presented by Blackstone\textsuperscript{78} in a discussion of the market for electrofax copiers. Copiers were leased at a relatively low price while supplies, such as paper and chemicals, which were tied to copiers, were priced at a substantial markup over cost.

Recently, two other explanations for metering arrangements have been advanced. Hansen and Roberts\textsuperscript{79} argue that if a leased tying good is durable and if its rate of depreciation depends on the intensity of its use, then the additional cost imposed by high intensity users may justify their paying a higher price than is paid by low intensity users. They argue that in this context tying is simply a way to measure the actual services performed by the durable good and may therefore be an efficient form of pricing.\textsuperscript{80} Alternatively, Liebowitz argues that metered tie-ins are a form

\textsuperscript{75.} For example, assume the constant average cost of product A is $100 and it is sold at a \textit{10\%} markup, so that its price is $110. The constant average cost of B is $1 and it is marked up \textit{100\%}, so that its price is $2. Now consider two customers: Customer 1 buys A and over its lifetime uses 1000 units of B, whereas customer 2 buys A but will use only 100 units of B. The total, undiscounted expenditures by customer 1 will be $110 + 1000($2) = $2110. The cost of supplying this buyer will be $100 + 1000($1) = $1100. Similarly, customer 2's expenditure will be $110 + 100($20) = $310 and the producer's cost will be $100 + 100($1) = $200. The price-cost ratio for customer 1 will be 1.918, which is substantially higher than customer 2's ratio of 1.55. This difference constitutes price discrimination.

\textsuperscript{76.} 298 U.S. 131 (1936).

\textsuperscript{77.} Whether leverage is manifest in a reduction in total output for the tied product is not clear. \textit{See infra} notes 84-85 \& accompanying text.


\textsuperscript{80.} \textit{Id.} at 78. Another commentator has pointed out that metered tie-ins, because of their ability to reduce the mechanical costs of metering, are likely to be allocatively efficient. The increased profits resulting from this efficiency should not be used as evidence of a Clayton Act violation. Markovits, \textit{Tie-Ins and Reciprocity: A Functional, Legal, and Policy Analysis}, 58 TEx. L. Rev. 1363, 1429 (1980). Other commentators have suggested that tie-ins are used because the seller may fear that the purchaser will cheat and underreport the intensity of use of the tying product. \textit{See Burstein, Tie-In Sales, supra note 49, at 69-72; see also Ferguson, Tying Arrangements and Reciprocity: An Economic Analysis, 30 LAW \& CONTEMP. PROBS. 552, 555-56 (1965).}
of risk sharing that may improve market efficiency.\textsuperscript{81} Suppose the intensity of use of the durable tying product, and thus the amount used of the tying product, varies directly with demand for the final product which the consumer produces using the tying product; then a metered tie-in with a low price for the durable product and a high price for the variable-use component, the tied product, will produce higher total expenditures for the package during periods of intense demand for the final product and lower expenditures when demand is slack.\textsuperscript{82} The purchaser of a durable good who is risk averse\textsuperscript{83} may be willing to pay the supplier of the durable good a premium to share in the risk resulting from this variable demand.

Notwithstanding these other explanations for tying goods with interdependent demands, we need to consider whether leverage occurs in this context. We will concentrate on the typical situation, one in which the goods tied are complementary.\textsuperscript{84} If two goods are complements, then


\textsuperscript{82} Liebeler has developed the same analysis and applied it to United States v. American Can Co., 87 F. Supp. 18 (N.D. Cal. 1949). In \textit{American Can}, the government attacked American's below-cost leases of can-closing machines that had been tied to requirements contracts for cans. Liebeler offered the following analysis:

The \textit{American Can} arrangements seem designed to create efficiency, however, by shifting risk from the packers to the can producers. One risk shifted is that of bearing the capital cost of an expensive can closing machine in a season of short crops, when it will be little used. If payment for the machine is through the purchase of cans, lower payments will be made in a lean year. Payments will be made up when crops are good and many cans are bought. The can producers appear to be able to deal with the risk of crop fluctuations more cheaply than individual packers because the former typically will cover wider geographic areas and broader crop lines than the latter. The diversity in yields as between different areas and different crops makes this "insurance" scheme feasible to the can producers.

Liebeler, Book Review, 66 \textit{CALIF. L. REV.} 1317, 1320 (1978) (reviewing \textit{R. BORK, THE ANTITRUST PARADOX} (1978))). Liebeler states that his analysis of \textit{American Can} is not original, and he cites United States v. American Can Co., 230 F. Supp. 859, 896 (D. Md. 1916), appeal dismissed, 256 U.S. 706 (1921). It is also interesting to note that Smaistrla cites \textit{American Can} as an example of the Hansen & Roberts model. \textit{See} Smaistrla, supra note 48, at 922. Thus, the Liebowitz/Liebeler analysis and the Hansen & Roberts analysis may be complementary.

\textsuperscript{83} Risk aversion means that the firm will be willing to pay a premium over the expected value of a loss to insure against that loss. In this case, there is uncertainty regarding the future profit stream, and a risk averse manager will be willing to accept lower profits if they are less variable.

\textsuperscript{84} \textit{See supra} note 58 for a definition of complementarity. An example of complementary products would be bread and butter: when the price of bread rises, the quantity demanded of bread falls and less butter is demanded for use on the bread, thus the demand for butter varies inversely with the price of bread.

It is conceivable that substitutes might have interdependent demands and be tied. An example of tying substitutes is described in Barzel, \textit{Competitive Tying Arrangements: The Case of Medical Insurance}, 19 \textit{ECON. INQUIRY} 598 (1981). Insurance packages tie together services which are substitutes so that an insured patient can use the lowest cost services. If one of the
an increase in the price of one good will decrease the demand for the other good. A firm tying both products must consider this interdependence in choosing the profit maximizing price. If, for example, the price of A is decreased and the price of B is increased relative to what they would be without tying, the net effect is ambiguous: decreasing the price of A increases the demand for B (due to complementarity), while increasing the price of B decreases the demand for B. Whether the total amount of B increases or decreases, that is, whether leverage has occurred, is unclear. It appears that any leverage existing in the market for the tied good is "purchased" by a decrease in the price of the tying good. Thus, even if a tie-in results in leverage, it does not necessarily have a net anti-competitive effect. But it is inaccurate to say that there is no leverage in tie-ins and that there are no anti-competitive effects associated with tying arrangements.\textsuperscript{85}

**Profitable Alternatives to Tying**

An Introduction to Nonlinear Payment Schedules

In the preceding section, we demonstrated that while leverage may exist in some circumstances, tying probably occurs for reasons unconnected with leverage, such as price discrimination. Indeed, many economists have identified price discrimination by metering as the key motivation for tying.\textsuperscript{86} We also pointed out some nondiscriminatory reasons for tying.\textsuperscript{87} Having made these points, we now intend to show that

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services were not insured, the patient would always use the insured service, even if it were more costly (to the insurer). This is a type of adverse selection which can be prevented by the tying arrangement.

One commentator claims that leverage occurs only when goods are complements: When product complementarity is involved, the higher price charged for product B [tied product] is not a substituted means of charging for product A [tying product]. On the contrary, output of product B for use with product A is less than any output of product B for such use which would exist by manipulation of the price or output of product A when product B is competitive. In other words, the result of the tie-in is to create the equivalent of another monopoly, a monopoly over product B for use with product A. The tie-in thus yields the equivalent of monopoly by a single seller over both A and B . . . . Leverage is present; and the tie-in provides the leverage, since the price and output of one product will necessarily affect the price and output of the other.

Bowman, *supra* note 49, at 25-26 (footnotes omitted). Telser, however, argues that the sole purpose of the tie-in is price discrimination. See Telser, *A Theory of Monopoly of Complementary Goods*, 52 J. Bus. 211 (1979). It is not clear, however, that Telser's definition of leverage is consistent with the one given above. For a summary of Telser's analysis, see Smaistrla, *supra* note 48, at 923-25.

85. Some writers have made this claim. See, e.g., Smaistrla, *supra* note 48, at 927.
86. See *supra* notes 74-78 & accompanying text.
87. See *supra* notes 79-83 & accompanying text.
even if leverage were a problem associated with tying arrangements, the Court's attempt to improve market performance by outlawing tie-ins is ineffective. The prohibition is ineffective because, at least with regard to complementary goods with variable proportions—the most common context in which tying arrangements arise and also the case most likely to result in leverage—a pricing strategy is available that is economically very similar to tie-ins, yet is perfectly legal.

We focus our attention on the situations in which commodities must be consumed with a positive quantity of a complementary product and the amount of the complement tied to the basic (tying) product depends on consumer preferences. The antitrust cases on tying illustrate numerous product relationships of this sort. In nearly all cases the complementary requirement is available in a competitive market. Reducing the economic issues to their simplest level, controversy arises because a monopolist seeks to exert control over the competitive price of a complementary requirement by making the sale of its basic product conditional on the purchase of all the buyer's requirements for the complement from the monopolist.

In this section, we hypothesize a monopolist that charges a competitive price for the complement, but at the same time presents consumers with an alternative payment plan that ties (or bundles) the two goods in such a way that consumers decide how much of the complement they take with a basic product. We demonstrate that when buyers have a choice between paying the competitive price for the complement and paying one price for a package that combines the monopolized product with an amount of the complementary requirement specified by the consumer, the monopolist's profits frequently increase. Furthermore, by assigning specific algebraic forms to the demand function, we can show that profits closely approximate and may even exceed those earned from tying.

This kind of packaging or "bundling" strategy is common. Examples of it include the offer of an open maintenance agreement with the purchase of a durable good, the provision of an "unlimited" number of...

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88. See, e.g., International Salt Co. v. United States, 332 U.S. 392 (1947) (salt processing machines and rock salt); IBM v. United States, 298 U.S. 131 (1936) (computing machines and punch cards).

89. Customers are frequently given the option of paying for repairs as they come up or purchasing an extended warranty contract that obligates the dealer to make all repairs over a specified period of time. Hence, all of the repairs a car requires are provided at one price. Maintenance on new household appliances such as refrigerators, dishwashers, and washing machines are also presented in such a way that the consumer has the option of buying repairs...
checks with a bank account, and free delivery with any purchase.\textsuperscript{90} Whenever consumers are given a nontrivial choice between payment plans, a nonlinear payment schedule is generated.

In order to understand nonlinear payment schedules, one must first consider linear payment schedules. Suppose consumers can be indexed by the amount of the complementary requirement they demand with one unit of the monopolized product. Let \( r_i \) be the consumer preference index representing one group of buyers who have the same demand curve for the requirement. Consumers can be characterized by the index as demanding from as little as none of the requirement to as much as some arbitrary amount we call \( R \).\textsuperscript{91} If all consumer types pay the same prices for the basic product and the necessary complement, a \textit{linear} payment schedule is generated, as shown in Figure 3.\textsuperscript{92} The total payment made by a consumer depends upon how much of the requirement \( (r) \) he or she takes with the basic product \( (x) \). The price of the requirement is \( p_r \), and \( p_x \) is the price of the basic product. The \( r_i \) consumer type pays \( p_x + p_r r_i \) for the package of one unit of \( x \) plus the amount of \( r \) the index type takes with the product. The slope of the schedule is the price \( (p_r) \) that consumers must pay for each unit of the requirement regardless of how much they take.

as they arise or obligating the dealer to make repairs for a fee packaged with the sale of the appliance.

Additional examples of economically similar arrangements abound. Telephone companies offer to provide long distance telephone service on a price per minute basis, or charge one price for unlimited calls (W.A.T.S.). Water utilities give consumers a choice between paying for metered water consumption on a per gallon basis or paying one monthly charge for unlimited consumption. Equipment rental agreements—office or construction machinery, for example—are sometimes written with a charge per hour or per day, or the machinery can be leased for longer periods at one fixed fee. In all these examples, consumers expecting to take large quantities of the service or requirement pay the fixed charge. Those expecting to consume small amounts select the per unit charge. In this way, large and small buyers are effectively separated into two markets.

\textsuperscript{90} This type of bundling is much like the pure bundling strategy described in Adams & Yellen, \textit{Commodity Bundling and the Burden of Monopoly}, 90 Q.J. Econ. 475, 478-79 (1976). The difference is that Adams and Yellen considered bundles with fixed proportions. Our model involves variable proportions; the content and, as a consequence, the cost of the bundle changes across consumers. If, however, there is free disposal and all consumers take the maximum amount possible, then nonlinear bundling and pure bundling are the same since the amount of the complementary requirement combined with the basic product is fixed. This seems unlikely because disposal is costly.

\textsuperscript{91} That is, we assume \( 0 < r_i < R \).

\textsuperscript{92} A linear payment schedule is represented by a straight line. The straight line represents the function \( y = mx + b \), where \( m \) is the slope and \( b \) is the \( y \)-intercept. In the immediately following text, \( m = p_r \) and \( b = p_x \).
A nonlinear payment schedule can be created by changing the effective price of the basic product and requirement to some buyers. Suppose the monopolist bundles as much of the requirement as a consumer chooses to take with the basic product and sells the entire package at the price $P_b$. Consumers then have a choice between buying product $x$ bundled with an indefinite amount of the requirement at a relatively high price ($P_b$), or paying the going price for $x$ ($p_x$) and purchasing each unit of the requirement at $P_r$.\footnote{In these cases, and throughout the remainder of our economic discussion, there is an implicit upper bound on the amount of requirement available, but it is essentially nonbinding in our analysis.}

Figure 4 shows that this bundled offer changes the linear payment schedule to a nonlinear schedule. Consumers, when given the choice, locate on the lower portions of the intersecting payment schedules. Those buyers with an index $r_i < r_o$ (i.e., those who demand less of the complement) continue to purchase the basic and complementary prod-\footnote{That is, a customer does not elect to pay the price that gives him an "unlimited" amount of the requirement and then sell the requirement to another buyer for a price less than $P_r$. In the above examples this would be a difficult feat, but in some markets it represents a serious threat to the success of a bundling strategy. If a computer company, for instance, supplied its buyers with "free" tabulating cards, customers could easily resell the cards to other computer users, competing with the company's individual card prices.}
ucts separately, while those with $r_i > r_o$ (i.e., who demand more of the complement) purchase the bundle. Thus the relevant portions of the two payment schedules form a kinked or nonlinear payment schedule.\footnote{This description should be related to the rather extensive nonlinear price literature. The parallel with this literature can be seen by thinking of a firm that prices the complement competitively as setting a two-part tariff, where the fixed part of the tariff is the price of the monopolized product. See supra note 68. Offering the basic product with unlimited quantities of the complement as an alternative to pricing the two separately is the same as presenting another tariff structure, except that after paying the fixed tax the charge per unit drops to zero. The pricing strategy we have in mind may therefore be thought of as combining a pair of two-part tariffs. Viewed in this light, our work can be related to that of Leland & Meyer, Monopoly Pricing Structures with Imperfect Discrimination, 8 BELL J. ECON. 449 (1976); Willig, Pareto Superior Nonlinear Outlay Schedules, 9 BELL J. ECON. 56 (1978); and Faulhaber & Panzar, Optimal Two-Part Tariffs with Self-Selection, Bell Laboratories Discussion Paper #74 (1977); which explore the profitability and performance of nonlinear price schedules constructed by allowing consumers to choose from price schedules that include one or more two-part tariffs.}

Figure 4
A Nonlinear Payment Schedule

The kind of pricing strategy described in Figure 4 can frequently be more profitable than tying. The bundle is a tie-in arrangement of sorts; indeed, anytime products are bundled there is some semblance of tying, at least from an economic point of view. In this case, however, because there is a choice between payment plans, there is no coercion to purchase...
the bundle. Moreover, the tie-in is very informal; consumers can specify, free of charge, how much of the requirement they choose to combine with the basic product once the bundled price is paid. For these reasons, the lack of coercion and the flexibility of the bundle’s composition, we argue later that courts should and probably would find the nonlinear payment strategy legal.

Profit Maximizing Nonlinear Payment Schedules

In general, the profitability of presenting a bundled alternative depends on the relative magnitudes of the own-price and cross-price elasticities in the market. The less elastic the demand is for the basic product and the bundle, the more profitable will be this method of pricing. We will show that, assuming a uniform distribution of consumers across the index and the existence of linear demand curves for all buyer types, this nonlinear schedule leads to profits that may even be greater than those earned from tying. In other words, the profitability of illegal tie-ins can be virtually duplicated by the less controversial pricing strategy outlined here.

This linear demand model also can demonstrate that certain nonlinear schedules are preferred over linear schedules, not only by the seller, but also by consumers. As a group, consumers favor having a choice because those who buy the bundle will pay lower overall prices for the basic good and the requirement, while those who do not buy the bundle will be indifferent to the bundling alternative. When every market participant either prefers or is indifferent to a new payment schedule, the schedule is said to be Pareto superior. Generally, payment schedules that give consumers a choice preferable to the prices they already pay will be Pareto superior. After demonstrating the increased profit-

96. That is, there are reasonable alternatives available to the consumer. Even when this degree of consumer sovereignty is present, however, there is always the possibility that the economic concept of choice will differ from what is held to be coercive under the antitrust laws. This prospect is discussed in analyzing the legality of this bundling strategy, infra at notes 121-163 & accompanying text.

97. Id.


99. Thus tying may not be undertaken to price discriminate or extend market power over other products. For more discussion on the reasons for tying, see Liebowitz, supra note 81, at 387.

100. For a detailed discussion of Pareto optimality, see NG, WELFARE ECONOMICS (1980).
ability of the bundling strategy suggested in Figure 4, we will show that nonlinear Pareto superior schedules can be identified.

In this model, we assume that consumers are uniformly and continuously distributed along the consumer preference index. We also assume that each consumer type in the index combines a different, but fixed, amount of the complementary product with each unit of the basic good; thus, each consumer has a perfectly inelastic demand for the complementary requirement. Finally, we assume that each buyer has a linear demand curve for the basic product and the bundle. The index does not enter into the demand schedules for buyers of the bundle because they are free to take as much of the complement as they desire after paying \( p_b \).

Costs of each unit to the seller will be constant, but the cost of providing the bundle will vary because consumers take different amounts of the requirement.

We are now able to express the seller's profit, which is the difference between total revenue and total cost. The producer of \( x \) does not have any monopoly power in the market for \( r \), so its price will tend to equal marginal cost. Thus, when the basic product and its complement are sold individually through linear pricing, profit to the monopolist will be the monopoly profits from sales of the basic product plus the reasonable return on investment from sales of the complement. When \( x \) is bundled with the complement, the profit function changes.

101. The range of the demand elasticity necessary for the profitability of the pricing strategy outlined here is more fully explained in Ormiston & Phillips, supra note 98. Perfectly inelastic demand is a simplifying assumption that does not alter the general conclusion of the analysis. Linear demand is also not a necessary condition. These assumptions are very common to the spatial economics literature. See, e.g., M. GREENHUT, A THEORY OF THE FIRM IN ECONOMIC SPACE (1971); Beckman, Spatial Price Policies Revisited, 8 BELL J. ECON. 619 (1976); Capozza & Van Order, A Generalized Model of Spatial Competition, 68 AM. ECON. REV. 896, 898 (1978).

102. In Figure 4 we write these demand schedules in an extremely simple form. Each schedule has a slope of -1 and intersects the vertical (price) axis at 1. Algebraically we express these linear schedules in the form:

\[
\begin{align*}
x_i &= 1 - p_x - p_r r_i \\
b &= 1 - p_b
\end{align*}
\]

103. For each unit of \( x \) the cost is \( c_x \) and for each unit of \( r \) the cost is \( c_r \).

104. \( c_b = c_x + r c_r \).

105. For buyers who choose not to purchase the bundle, the seller's profit \( \pi \) for the \( j \)th consumer type is

\[
\pi_j = (p_x - c_x)(p_r - c_r) + r_i (p_r - c_r).
\]

106. Profits to the monopolist from linear pricing \( \pi_L \) may be expressed, after substituting the demand curve for \( x \), as

\[
\pi_L = (1 - p_x - c_x) (p_r - c_r).
\]

107. If \( b \) is sold, profits \( \pi_b \) are

\[
\pi_b = b (p_b - c_x - r c_r) = (1 - p_b) (p_b - c_x - r c_r).
\]
The goal of the firm is to maximize profits by selling \( x \) either separately or in a bundle. The algebra necessary to derive the profit maximizing prices is rather involved,\(^{108}\) but the results are that a profit maximizing firm should set prices for the bundle such that one half of the customers will choose to pay the individual per unit prices, and the other half will choose to buy the bundle.\(^{109}\) Profits from the nonlinear strategy are:

\[
\text{Profit Maximizing Linear and Nonlinear Payment Schedules}
\]

\[\text{Figure 5}\]

---

\(^{108}\) Let \( D \) be the uniform distribution of buyers along the index. Then the firm seeks to

\[
\begin{align*}
\text{Max } \pi_{NL} &= D \left[ (p_x - c_x) \int_0^{R} (1 - p_x - p_r) \, dr + (1 - p_b) \int_0^{R} (p_b - r c_r - c_x) \, dr \right] \\
\end{align*}
\]

Necessary first order conditions for profit maximization are

\[
\begin{align*}
\frac{\partial \pi_{NL}}{\partial p_x} &= \int_0^{R} (1 - p_x - p_r) \, dr + (p_x - c_x) \int_0^{R} 1 \, dr = 0 \quad \text{and} \\
\frac{\partial \pi_{NL}}{\partial p_b} &= -\int_0^{R} (p_b - r c_r - c_x) \, dr + (1 - p_b) \int_0^{R} 1 \, dr = 0.
\end{align*}
\]

We also have the condition that \( r = \frac{p_b - p_x}{c_x} \). These three equations in three unknowns lead to the solutions stated \textit{infra} note 109.

\(^{109}\) These prices would be

\[
\begin{align*}
p_x &= \frac{4 - c_x R + 4 c_x}{8}, \\
p_b &= \frac{4 + 3 c_x R + 4 c_x}{8}, \quad \text{and as a result} \\
r_o &= \frac{R}{2}.
\end{align*}
\]
ergy exceed those from the most profitable linear strategy by 12.5\%\textsuperscript{111}.

Figure 5 illustrates the relative positioning of the payment schedules. The schedule with the intercept at $p_x$ is the most profitable schedule without bundling. When a monopolist decides to offer the bundle at the alternative price, the profit maximizing price of the bundle ($p_b$), it simultaneously raises the profit maximizing price of the basic product ($p_x$). Those consumers located to the left of $5R/8$ would rather not have the nonlinear strategy instituted because they unambiguously pay higher prices. Only those consumers to the right of $5R/8$ prefer having the choice. Hence, the most profitable nonlinear schedule for the firm is not Pareto superior to the most profitable linear schedule. However, we will show at the end of this section that if the firm did not raise the individual price of $x$, but held it fixed at $p_x$ when the bundle was offered, profits would still increase and the nonlinear schedule would be Pareto superior because all consumers would be left either unharmed or preferring the bundle.

Figure 5 facilitates an intuitive appreciation of why the nonlinear price schedule is more profitable than a linear strategy. As $r$ gets larger for any consumer type, more of the requirement is combined with the basic product. For any fixed $p_x$ and $p_r$, total expenditures on the product

\[ This means that the payment schedules intersect in exactly the middle of the distribution of customers. \]

\textsuperscript{110} With these prices, profits for the nonlinear strategy $\pi_{NL}$ are

\[ \pi_{NL} = \frac{1}{8} (w + \frac{15}{24} cR^2), \text{ where } w = 2 - 2c_xR - 4c_x + 2c_x^2 + 2c_x c_R. \]

\textsuperscript{111} When a monopolist practices a linear selling strategy and prices the requirement at marginal cost, the objective is to

\[ \text{Max } \pi_L = D(p_x - c_x) \int_0^R (1 - p_x - p_r) dr. \]

The necessary first order condition for profit maximization is

\[ \frac{\partial \pi_L}{\partial p_x} = \int_0^R (1 - p_x - p_r) dr + (p_x - c_x) \int_0^R 1 dr = 0. \]

Solving this equation for $p_x$ yields

\[ p_x = \frac{2 + 2c_x - c_x R}{4}. \]

Substituting this price back into the profit function $\pi_L$ yields the profits

\[ \pi_L = \frac{1}{8} (w + \frac{12}{24} c R^2). \]

By looking at the expressions for $\pi_{NL}$ and $\pi_L$ it is easily observed that $\pi_{NL} > \pi_L$ (i.e., $15/24 > 12/24$).
and requirement also increase, and the elasticity of demand increases.\textsuperscript{112} Hence, as we move along the \( r \) index, consumers have increasingly more elastic demand schedules. A profit maximizer knows it can increase revenue by charging a relatively low price to buyers with high elasticities and a high price to buyers with a low demand elasticity.\textsuperscript{113} This is exactly what happens when nonlinear prices are set as in Figure 5. Buyers who purchase 5\( R/8 \) or less of the complement pay higher prices than under the linear schedule \((p_x + p_r r)\), and those who purchase more than 5\( R/8 \) units of the requirement—consumers with a higher elasticity of demand—pay relatively lower prices than they would under the most profitable linear schedule. Altering prices in this way has the effect of increasing total revenue to the seller.

Let us now compare the profits earned from nonlinear pricing to the maximum profits that can possibly be earned from tying, assuming the monopolist is not constrained by the antitrust laws from tying the products. An upper limit on the profitability of a tying arrangement can be found by simply assuming the firm has a monopoly in both markets. The firm would not have to set the price of the requirement at the competitive price. The profitability of behaving like an unconstrained monopolist in both markets\textsuperscript{114} is greater than the profits earned under either of the lin-

\begin{footnote}
112. Similar to the definition of cross-price elasticity \textit{supra} note 88, the price elasticity of demand for the basic product \( x \) is

\[ \eta_{xx} = \frac{\Delta x_i}{\Delta p_x} \cdot \frac{p_x}{x_i}, \]

where the first term is the slope of the demand schedule \( x = 1 - p_x - p_r r \), and is easily observed to be \(-1\). Substituting, we see that

\[ \eta_{xx} = \frac{-p_x}{x_i} = \frac{-p_x}{1 - p_x - p_r r_i}. \]

The last ratio shows that as \( r_i \) increases, demand becomes more elastic.

113. This observation is the essence of any price discrimination strategy. Buyers with low elasticities will purchase more units if and only if price is relatively low; buyers with high elasticities will purchase even if price is relatively high. The profitability of charging high prices to consumers with low elasticities of demand is seen especially well in third degree discrimination. For an intermediate discussion, see S. MAURICE, O. PHILLIPS, & C. FERGUSON, \textit{ECONOMIC ANALYSIS}, 417-21 (4th ed. 1982).

114. The profit function for a firm acting like a pure monopolist in both markets is

\[ \pi_m = \mathcal{D}\left[ \int_0^{p_0} [p_x - c_x + r(p_r - c_r)](1-p_x - p_r r)dr + (1-p_h) \int_{r_0}^R (p_h - rc_r - c_x)dr \right]. \]

The function is general enough to allow a monopolist to price discriminate. Indeed, we shall see that when it is maximized, the solution is commonly referred to as discriminatory pricing since consumers only pay half of the true requirement cost. The firm maximizes this function with respect to the variables \( p_x, p_r, \) and \( p_h \). After integrating, the necessary first order conditions for profit maximization are
ear or nonlinear strategies discussed so far.\textsuperscript{115} It is important to note that when the firm has complete control of both markets it is not in its best interest to offer a bundle. The firm can maximize its total profits by charging separate monopoly prices for each product.\textsuperscript{116} Once again, these profits represent an upper limit on the profits that may be earned from tying.

The difference between these nonbundled profits in the case of complete monopoly in both markets and the nonbundled profits when the requirement market is competitive\textsuperscript{117} can be reduced by 75\% when the competitive requirement is bundled through the use of a noncoercive, nonlinear pricing strategy.\textsuperscript{118} This reduction is a remarkable feat. A

\[
\frac{\partial \pi}{\partial p_x} = r_o - \frac{r_o^2}{2} (p_x-c_x) - p_x r_o - p_r \frac{r_o^2}{2} = 0,
\]

\[
\frac{\partial \pi}{\partial p_r} = \frac{r_o^2}{2} (1-p_x) - \frac{r_o^2}{2} (p_x-c_x) - \frac{r_o^3}{3} (p_r-c_r) - p_r \frac{r_o^3}{3} = 0.
\]

\[
\frac{\partial \pi}{\partial p_b} = -p_b (R-r_o) + c_x (R-r_o) + \frac{c_r}{2} (R^2-r_o^2) + (1-p_o) (R-r_o) = 0.
\]

Solving these equations for prices and using the condition that

\[r_o = \frac{p_b - p_x}{p_r}\]

yields

\[p_x = \frac{1 + c_x}{2}, \quad p_r = \frac{c_r}{2} \quad \text{and} \quad r_o = R.
\]

These prices can then be substituted into the above profit function to give the profitability \(\pi_m\) of an unconstrained monopolist in both markets:

\[\pi_m = \frac{1}{8} (w + \frac{16}{24} c_r^2 R^2).
\]

Notice that buyers are only paying half the cost of the purchased requirement, so those buyers who are consuming large amounts of the product are receiving relatively large discounts. These are the buyer types who also have high elasticities of demand. See supra note 112.

115. Compare the unconstrained monopoly profits \(\pi_m\) with the nonlinear pricing profits \(\pi_{NL}\) and the linear pricing profits \(\pi_L\). Note that 16/24 > 15/24 > 12/24. Thus,

\[\pi_m > \pi_{NL} > \pi_L.
\]

116. Individual monopoly prices are set for the products at \(p_x = \frac{1 + c_x}{2}\) and \(p_r = \frac{c_r}{2}\). See supra note 114.

117. \(\pi_m - \pi_L = \frac{c_r^2 R^2}{8} (\frac{16}{24} - \frac{12}{24}) = \frac{4c_r^2 R^2}{192}\).

118. This difference is reduced to

\[\pi_m - \pi_{NL} = \frac{c_r^2 R^2}{8} \frac{1}{24} = \frac{c_r^2 R^2}{192}.
\]

The 75\% reduction is demonstrated by noting that

\[\frac{c_r^2 R^2}{10\gamma} \text{ is } 25\% \text{ of } \frac{4c_r^2 R^2}{10\gamma}.
\]
selling strategy that presumes no monopoly power whatsoever in the requirement product market and lets consumers choose between payment plans achieves nearly the same profitability earned by someone who is a monopolist in both markets. Such a nonlinear strategy may be even more profitable than a tie-in in the usual case. Thus, sellers may view this as an alternative attractive to tying arrangements.

The last point we wish to make, in defense of such a bundling strategy, is that it is possible to construct a nonlinear price schedule that is Pareto superior to a linear schedule. Returning to Figure 5, suppose the producer offered to sell the basic product at \( p_x \) and also sold a bundled product at \( p_b \) as shown in the diagram. Those consumers to the right of \( r_o \) (i.e., those with an index value \( r > \frac{5R}{8} \) in Figure 5) will choose to buy the bundle and are better off by having this alternative method of payment. The buyers to the left of \( r = \frac{5R}{8} \) are faced with the same linear price schedule as before and therefore are indifferent. Thus, because some consumers prefer the nonlinear schedule and no consumers are harmed by it, this schedule is Pareto superior to a linear one, and profits are still greater than maximum profits without bundling.\(^{119}\)

This section has examined an alternative, noncoercive pricing strategy available to firms most likely to utilize coercive tie-ins in the absence of an antitrust prohibition. We have established that nonlinear pricing strategies can generate profits approximating the profits available through tying. Thus, we believe that the current antitrust status of tie-ins only encourages the adoption of these nonlinear strategies. If, as we have shown, profits to the seller under nonlinear pricing strategies approximate those from tie-ins and if, as we will argue in the next section, these strategies are legal, then the prohibition of tying arrangements could not significantly inhibit the leverage which the Court associates with tie-ins.

**Antitrust Analysis of Nonlinear Pricing**

Our argument for abandoning the rule of per se illegality of tying arrangements is that current doctrine only encourages the use of an alter-

\[^{119}\] It is a matter of calculating the profit level of

\[
\pi = \int_{0}^{\frac{5R}{8}} (p_x - c_x)(1 - p_x - rc)dr + (1 - p_b) \int_{\frac{5R}{8}}^{R} (p_b - rc - c_x)dr
\]

\[
= \frac{1}{8} \left( w + \frac{73c}{128} \frac{R^2}{2} \right),
\]

where \( p_x = \frac{2 + 2c_x - c_x R}{4} \) and \( p_b = \frac{4 + 3c + 4c_x}{8} \).
native pricing strategy which is unobjectionable and which yields comparable profits. Having outlined such a strategy and having demonstrated its profit potential, it remains to be shown that it is, in fact, unobjectionable from an antitrust standpoint.

Nonlinear pricing should withstand antitrust challenges primarily because of the economic considerations. Of course, nonlinear pricing should not be held per se illegal under tie-in doctrine for the same reasons that have been advanced by economists and discussed here regarding tying arrangements in general: tying arrangements rarely involve leverage, often involve efficiencies, and are costly to prohibit. But even if, as we will assume, the Court’s economic theories of tying arrangements were sound, nonlinear pricing can increase consumer welfare relative to single item pricing given a seller’s monopoly in the basic product market. We have shown in the previous section that this is a possible outcome when the seller has priced the basic product so as to produce Pareto superiority. Given the Court’s current endorsement of the consumer welfare standard for evaluating antitrust challenges, an expansion

120. See supra notes 86-119 & accompanying text.
121. See supra notes 42-85 & accompanying text.
122. To make even buyers to the left of \( \frac{5R}{8} \) prefer this pricing plan, some of the increased profits to the monopolist can be fed back to consumers by setting the price of the basic product sold individually \( p_x \) a little lower.

The result is a nonlinear schedule which consumers and the monopolist prefer over a linear schedule. As long as a horizontal bundled schedule intersects the linear unbundled schedule \( p_x + r_p \) to the right of \( \frac{R}{2} \) all consumers prefer or are indifferent to the plan and the seller earns more profits. It can be proven that, given \( p_x \) and a bundled price \( p_b > p_x + \frac{R}{2} p_r \), profits of the seller increase. Let the firm set the most profitable linear payment schedule in which \( p_x = \frac{2+2c_x-c_r}{4} \). A general way of expressing any bundled alternative is to set \( p_b = p_x + (1-\epsilon)c_p \), where \( \epsilon > 0 \) is an arbitrary constant and \( r_o = 1-\epsilon \). For \( p_x \) and \( p_b \) profits are calculated to be

\[
\pi = \frac{1}{8} (w + \frac{12}{24} c^2 R^2) + \frac{\epsilon^2 c^2}{2} (\frac{1}{2} - \epsilon).
\]

Ignoring the last term on the right, these are profits from the strict linear strategy. As \( \epsilon \) approaches 0 or \( \frac{1}{2} \), profits approach these earnings, and whenever \( 0 < \epsilon < \frac{1}{2} \), profits for the monopolist are greater than the linear profits since the last part of the above expression is positive for such values of \( \epsilon \). By again feeding back some of the increased profits in lower prices to those consumers indifferent to having a choice, any arbitrary uniform price that cuts the profit maximizing nonbundling schedule above \( r_o = \frac{1}{2} \) is preferred by all market participants and is therefore strongly Pareto superior.

There exists, therefore, a family of nonlinear schedules that are more efficient than purely linear schedules.

123. See supra notes 119, 122 & accompanying text.
124. The Supreme Court, specifically the Burger Court, has adopted a pragmatic, effi-
sion of the prohibition of tying arrangements to include a prohibition of nonlinear pricing strategies would be unwise.

Case law concerning the legality of nonlinear pricing is somewhat sparse, despite the fact that these strategies are commonly used. Perhaps this scarcity is due to the Supreme Court’s statement in *Northern Pacific* that “where the buyer is free to take either product by itself there is no tying problem even though the seller may also offer the two items as a unit at a single price.” Arguably, this is the definitive word on the legality of nonlinear pricing. Some lower courts, however, have indicated that price tie-ins may be illegal under certain circumstances. In view of the Court’s treatment of “coercion” in *Jefferson Parish Hospital*, it is important to clarify the conditions under which courts will find that nonlinear pricing permits enough “consumer freedom” to avoid illegality. The antitrust analysis that follows shows that a pricing strategy that presents viable alternatives to consumers will be considered non-coercive. Truly nonlinear strategies present such viable alternatives and thus probably will not be held illegal.

Efficiency oriented antitrust policy which stresses the importance of maximizing consumer welfare. See Reiter v. Sonotone Corp., 442 U.S. 330, 343 (1979) (legislative history of the Sherman Act “suggest[s] that Congress designed [it] . . . as a ‘consumer welfare prescription’” (quoting R. Bork, supra note 44, at 66)); Continental T.V., Inc. v. GTE Sylvania, Inc., 433 U.S. 36, 53 (1977) (“Competitive economics has social and political as well as economic advantages . . . but an antitrust policy divorced from market considerations would lack any objective benchmarks”); see also Easterbrook, *Is There A Racket in Antitrust Law?*, 60 Tex. L. Rev. 705 (1982); Liebeler, supra note 82, at 1317 (“From an economic standpoint, the goal of antitrust law is to balance allocative and productive efficiency in an attempt to maximize the total wealth of society.”).

For the view that antitrust law should be concerned with more than consumer welfare, see L. Sullivan, * supra* note 8, at 376 (“The antitrust laws do not deal solely with problems of allocative efficiency.”); Redlich, *The Burger Court and the Per Se Rule*, 44 Alb. L. Rev. 1 (1979). See also Bohling, *A Simplified Rule of Reason for Vertical Restraints: Integrating Social Goals, Economic Analysis and Sylvania*, 64 Iowa L. Rev. 461 (1979) (interpreting Supreme Court cases as not precluding an antitrust doctrine based on noneconomic goals).

For an analysis of the tradeoffs between efficiency and other societal goals, see Elzinga, *The Goals of Antitrust: Other Than Efficiency, What Else Counts?*, 125 U. Pa. L. Rev. 1191 (1977). Elzinga stresses that efficiency and equity are not necessarily mutually exclusive goals, but he cautions against pursuing equity when they happen to diverge: “While it may seem tolerant, even humanitarian, to call for equity at the expense of efficiency, those who do so seldom are the ones suffering the loss in real wealth.” Id. at 1213.

125. See * supra* notes 89-90 & accompanying text.
127. See *infra* notes 130-61 & accompanying text.
128. See * supra* text accompanying notes 30-40.
The clearest example of nonlinear pricing that has been challenged is found in *American Manufacturers Mutual Insurance Co. v. American Broadcasting-Paramount Theatres, Inc.* The case involved television advertising by the Kemper Insurance Companies on ABC's early evening news program. Kemper had identified ninety-five stations as its desired advertising lineup, but conflict arose concerning the sale of advertising on thirty-two unwanted stations. ABC, in essence, told Kemper that it would cost the same to sponsor the program on all available affiliates as it would to sponsor it on only the stations Kemper desired. In fact, there would be substantial additional charges to cover the cost of blacking-out the unwanted stations. Kemper was given the option of selecting its own stations and paying for them at the individual "rate card" prices, prices which represented a ninety percent increase over the previously negotiated package price. Kemper dropped its demand to limit the advertising to its optimal lineup and agreed to sponsor the program on all available affiliates.

When Kemper did not fulfill its obligations under the contract, ABC

---

131. One problem was that Kemper's lineup included 28 stations not yet committed to carrying the Evening Report. ABC and Kemper agreed that Kemper would have an option to advertise on the undecided stations that eventually decided to pick up the Evening Report. 446 F.2d at 1134.
132. *Id.* at 1135.
133. *Id.* The nonlinear attributes of the ABC pricing strategy can be illustrated graphically.

[Diagram of nonlinear pricing strategy]

In the figure, \( p_i \) represents a linear pricing schedule where each station is offered separately. \( p_B \) is the bundle price for the 99 cleared stations. \( p_{BO} \) is the bundle price plus the blackout fee. \( p_i \) is 90% greater than \( p_B \). The effective nonlinear pricing strategy is reflected by \( O_{ab} \).
filed suit in state court to recover damages. The antitrust issue arose as a
defense that the contract constituted an illegal tying arrangement under
section 1 of the Sherman Act.\textsuperscript{134} Kemper then filed an antitrust action in
federal district court, seeking damages incurred in the state court litiga-
tion.\textsuperscript{135} After a summary judgment and dismissal,\textsuperscript{136} Kemper
appealed.\textsuperscript{137}

In reversing the summary judgment, the Second Circuit Court of
Appeals commented:

As we view the law, where there is no quality or distinguishing desider-
umatum between a product offered singly or in a package, the seller can-
not charge substantially higher for the individual product \textit{if the price
differential has the effect of conditioning the sale of the single product to
the sale of the entire package} and if the difference in price cannot be
legitimately justified by cost considerations.\textsuperscript{138}

The court thus implied that the element of coercion necessary for an
illegal tying arrangement is present when the only viable choice
presented to the buyer is the package.\textsuperscript{139} On remand, the district court
found for ABC, and Kemper again appealed. Rejecting the argument
that delay tactics in negotiations constitute a violation of the Sherman
Act, the Second Circuit reiterated its position that “there can be no ille-
gal tie unless unlawful coercion by the seller influences the buyer's
choice.”\textsuperscript{140}

\begin{itemize}
\item \textsuperscript{134} \textit{Id.} at 1132.
\item \textsuperscript{135} American Mfrs. Mut. Ins. Co. v. American Broadcasting-Paramount Theatres, Inc.,
\item \textsuperscript{136} \textit{Id.} at 650. The district court found, \textit{inter alia}, that there was no tying arrangement
because only one product was involved. \textit{Id.} at 646.
\item \textsuperscript{137} American Mfrs. Mut. Ins. Co. v. American Broadcasting-Paramount Theatres, Inc.,
388 F.2d 272 (2d Cir. 1967).
\item \textsuperscript{138} \textit{Id.} at 283 (emphasis added). The Second Circuit had assumed, \textit{arguendo}, that more
than one product was involved. \textit{Id.}
\item \textsuperscript{139} See \textit{American Mfrs. Mut.}, 388 F.2d at 283-84. The district court found for ABC on
the ground that Kemper “acted unreasonably in failing to negotiate further with ABC” over
the elimination of the undesired stations. \textit{American Mfrs. Mut.}, 446 F.2d at 1133.
\item \textsuperscript{140} 446 F.2d at 1137. On appeal, Kemper alleged that the district judge had applied
erroneous principles of law in rejecting the tying argument. Kemper offered a new formulation
of illegal tying: “whenever a seller offers a buyer a package; the buyer states he only wants
certain items in the package, and the seller delays \textit{at all} in offering to sell the designated items
at prices which are equivalent to the package price,” \textit{id.} at 1136, then the seller has violated the
Sherman Act. The Second Circuit rejected Kemper's proposal:

We find this sweeping proposition untenable . . . . Here, ABC exerted no pres-
sure on Kemper, successful or not . . . . To adopt Kemper's position would subject
businesses to threats of antitrust sanctions whenever they tried by bravado to buttress
a sagging market position by initially offering small quantities of desired goods at
high prices, in hopes of eliciting a large order without further negotiation. Such
bartering ploys are not generally the concern of antitrust laws.
\textit{Id.} at 1136-37.
\end{itemize}
In Consolidated Terminal Systems, Inc. v. ITT World Communications, Inc.,\textsuperscript{141} nonlinear pricing was unsuccessfully challenged by the seller of a competing tying product. Consolidated, the plaintiff, was a supplier of telex terminals and related equipment. The five defendants were authorized by the FCC to provide international telex transmission service from points within the United States to points abroad.\textsuperscript{142} Consolidated challenged the defendants’ nonlinear pricing scheme as an illegal tying arrangement under section 1 of the Sherman Act.\textsuperscript{143} Under this scheme, international telex subscribers were offered free or below cost equipment in return for a promise to use the transmission service of a particular defendant; the tying equipment was also available on less favorable terms to customers who did not make this promise.\textsuperscript{144} At trial, the district court judge held that Consolidated could not state a claim of per se illegality with respect to the alleged tying arrangement because of the unusual characterization of the facts of the case.\textsuperscript{145} The court then refused to find the practice illegal under the rule of reason because Consolidated, as a competitor in the market for the tying product, did not have standing to complain of the suppression of competition in the market for the tied product.\textsuperscript{146}

One case out of the Ninth Circuit has considered the legality of a nonlinear pricing strategy, focusing particularly on the coercion element and distinguishing an earlier Fourth Circuit case which had found a coercive price tie-in to be illegal. The nonlinear pricing strategy challenged in Ways & Means, Inc. v. IVAC Corp.\textsuperscript{147} was a marketing plan under

\begin{itemize}
  \item \textsuperscript{141} 535 F. Supp. 225 (S.D.N.Y. 1982).
  \item \textsuperscript{142} Consolidated was not authorized to, and did not provide, any telex transmission service. Prior to 1980, the defendants bundled the sale of the transmission service and related equipment through a “unified” rate structure that allowed for the recovery of related equipment costs through charges for the transmission service. On February 15, 1980, the FCC ordered the “unbundling” of the rate so that the telex equipment could be sold separately. \textit{Id.} at 226.
  \item \textsuperscript{143} The plaintiff also attacked the practice under § 2 of the Sherman Act as a conspiracy to monopolize the telex equipment market because all the defendants used the same nonlinear pricing strategy. The plaintiff failed to allege the market share of any defendants, and the court granted the defendants’ motion to dismiss Consolidated’s § 2 claim. \textit{Id.} at 228-29.
  \item \textsuperscript{144} \textit{Id.} at 231.
  \item \textsuperscript{145} \textit{Id.} The case was unusual because the relevant focus for tie-in claims is ordinarily the market for the tied product. In Consolidated Terminals, the tying product was telex equipment, and the tied product was international transmission service. The plaintiff alleged that its survival in the tying product market—terminals and related supplies—was threatened by the tying arrangement. \textit{Id.; cf. In re Uranium Antitrust Litigation}, 473 F. Supp. 393, 399-403 (N.D. Ill. 1979) (tying arrangements may also foreclose seller’s competitors for the tying product); P. Areeda & D. Turner, supra note 54, at ¶ 733e.
  \item \textsuperscript{146} 535 F. Supp. at 232.
  \item \textsuperscript{147} 506 F. Supp. 697 (N.D. Cal. 1979), \textit{aff’d} per curiam, 638 F.2d 143 (9th Cir. 1981).
\end{itemize}
which the defendant manufacturer (IVAC) rented its entire electronic temperature-taking system on the condition that the lessee agree to purchase 15,000 probe covers.\footnote{148} IVAC's customers also had the option of purchasing the individual components at a reasonably attractive price and then purchasing the probe covers on the open market.\footnote{149} Approximately twenty-five percent of IVAC's sales of components occurred through the latter option.\footnote{150}

The plaintiff, a competitor of IVAC who manufactured IVAC-compatible probe covers, brought suit alleging that the marketing plan was a tying arrangement in violation of the Sherman and Clayton Acts. The district court noted the availability of the direct sale option of purchasing the alleged tying product without the probe cover. Relying on the Supreme Court's statement in \textit{Northern Pacific},\footnote{151} the court concluded that the "tie-in" did not contain the coercive conditions necessary for a violation.\footnote{152} In the \textit{IVAC} case, plaintiffs relied on a Fourth Circuit case, \textit{Advance Business Systems \& Supply Co. v. SCM Corp.}\footnote{153} There the defendant, a copy paper retailer, had offered copying machines through a "copy service" plan. Under the plan, customers paid a flat fee per copy and were provided with an entire duplicating system, including copier, service, paper, toner, and other materials.\footnote{154} The court objected to the plan because the defendant's highly desirable copying machines could be purchased separately only at a prohibitively high price.\footnote{155} The \textit{SCM} court held that pricing tie-ins "are non-coercive, and therefore legal, only if the components are separately available to the customer on a basis as favorable as the tie-in arrangement."\footnote{156}

In addressing plaintiffs' argument in reliance on the \textit{SCM} case, the
IVA C court noted the significant percentage of sales outside of the lease-purchase tie-in and concluded that “plaintiffs have failed to produce sufficient evidence from which any inference of unfairness can be drawn with respect to defendant's pricing policy.”157 The district court granted defendant's motion for summary judgment, and the Ninth Circuit affirmed.158

Nonlinear pricing strategies will always resemble the scheme in IVA C in the respect which the court found relevant. A large number of unbundled sales will always occur.159 These strategies also will always be distinguishable from the scheme which the SCM court held illegal. The SCM scheme was linear and coercive.160 Nonlinear pricing always provides consumers with a viable alternative to purchasing the bundle.161

In summary, the economic effects of nonlinear pricing are such that

\[ p_x \]

\[ p_b \]

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In the figure, \( p_x \) is the price for the tying good and \( p_b \) is the bundled price. Since \( p_b \) is less than \( p_x \), customers will not view \( p_x \) as a reasonable alternative to \( p_b \). The prices are set in a manner that effectively coerces the customers into purchasing the bundle. This is the essence of a “price tie-in.” The pricing strategy is linear since the alternative price functions do not intersect. That is, the lower, bundled price line would always be selected.

161. Moreover, some consumers will prefer the bundle and others will prefer the linear pricing option. This effectively rules out the possibility of a class action attack on a nonlinear pricing strategy under the so-called “individual coercion” doctrine. See generally Austin, The Individual Coercion Doctrine in Tie-In Analysis: Confusing and Irrelevant, 65 Calif. L. Rev. 1143 (1977); Blair and Finci, supra note 30, at 558-63. Rule 23(b)(3) of the Federal Rules of Civil Procedure, under which most antitrust class actions are brought, requires that the court certify “that the questions of law or fact common to the members of the class predominate over any questions affecting only individual members.” The nonlinear pricing defendant will be able to show that certification would be improper because the pricing strategy is specifically

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it should not be held illegal under antitrust law. Moreover, the case law associated with nonlinear strategies and price tie-ins indicates that a finding of illegality requires a showing that challenged schemes effectively coerce buyers into purchasing the offered package. While coercive price tie-ins can thus be held illegal under tying doctrine, nonlinear pricing is non-coercive, and therefore not illegal, because it presents buyers with meaningful purchase options.\textsuperscript{162} The widespread use of nonlinear pricing also suggests that attacking such practices would be impractical.\textsuperscript{163}

**Conclusion**

Per se illegality is only appropriate when an act is certain, or almost certain, to create social losses. Furthermore, prohibition of an action must result in avoiding those losses at a reasonable enforcement cost. The Supreme Court, in maintaining its per se prohibition of tying, has chosen to ignore economists' well-reasoned attacks on the view that tying arrangements create monopoly power. Even if the Court's analysis of tying arrangements were correct, however, our analysis indicates that the per se prohibition of tie-in sales would not result in a significant increase in consumer welfare. The losses that allegedly result from tying arrangements are not avoided by a strict prohibition because firms shift their activities to different methods that are not illegal. Nonlinear pricing strategies, which are legally available to firms that, according to the Court's view, could otherwise use tying arrangements to extend their monopoly power, may be as profitable as tying arrangements. Thus, the potential gains from an effective prohibition of tie-in sales are small. Considering that the resources devoted to the enforcement of the prohibition may well exceed the potential gains from such enforcement, the per se prohibition should be abandoned.

\textsuperscript{162} See also Greenville Publishing Co. v. Daily Reflector, Inc., 496 F.2d 391 (4th Cir. 1974) (holding that reduced rates to those who purchased advertising in both defendant's newspaper and magazine were not per se illegal as tie-ins because of the voluntary nature of the rate).

\textsuperscript{163} One final possible objection to tie-ins and nonlinear pricing is that they might involve predatory pricing in the tied product market. See, e.g., Greenville Publishing Co., 496 F.2d at 396-99 (pricing strategy challenged on this basis). There are numerous predatory pricing theories, and numerous rules for detecting and prosecuting predatory pricing have been proposed. See Easterbrook, *Predatory Strategies and Counterstrategies*, 48 U. CHI. L. REV. 263 (1981) (survey and critique of the theories and policy proposals). Some writers, including Easterbrook, conclude that there is no reason for antitrust law to take predation seriously. See, e.g., R. Bork, supra note 44, at 144-60 (1978); McGee, *Predatory Pricing Revisited*, 23 J.L. & ECON. 289 (1980). In any event, the nonlinear pricing strategy outlined here does not involve below-cost pricing in either market and thus could not be construed as predatory pricing.
We conclude that the appropriate legal approach to tying is a rule of reason analysis that includes a presumption of legality. This approach would rid the courts of many cases in which there is no hope of any social gain from enforcing the law and would restrict attention to the few cases in which enforcement might improve the performance of the market. The Court should only prohibit tying when there is substantial likelihood of eliminating significant losses through legal action.164

Moreover, although the congressional intent to prohibit tie-in sales is evident in the Clayton Act and its legislative history,165 our analysis demonstrates that the effect of a tie-in is not "to substantially lessen competition or tend to create a monopoly" because alternative pricing strategies can accomplish similar economic results. The Court's analysis under the Sherman Act should be modified—abandoning the per se rule for a rule of reason—because, even if monopoly extension through tying arrangements were feasible, the legal, nonlinear pricing alternative vitiates any significant positive economic effect due to prohibition. The move to a rule of reason analysis of tying arrangements under both the Clayton Act and the Sherman Act would serve to reverse a futile, inefficient, and unwarranted policy.

164. If it is reasonable to expect that the tying arrangement would create barriers to entry, legal action would be appropriate. This Article does not address the barriers to entry aspect of tying, but such an effect from a tying arrangement could be determined by a rule of reason analysis.

165. See supra note 7.