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Tying Arrangements

Erik Hovenkamp
Northwestern University

Herbert J. Hovenkamp
University of Pennsylvania Carey Law School

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CHAPTER 14

 TYING ARRANGEMENTS

ERIK HOVENKAMP AND HERBERT HOVENKAMP

 14.1. INTRODUCTION; IDENTIFYING TIES

TYING arrangements, sometimes known as “ties,” “tie-ins,” “tied-in sales,” or “bundles,” occur when a firm offers two separate products together, refusing to sell one of them without the other. Identifying when two things are really a single product—such as a shirt and its buttons or an automobile and its tires—has proven controversial. The dominant position looks at ordinary business practices in order to determine whether the products are commonly sold separately. In its *Jefferson Parish* decision (1984) the Supreme Court held that the separate product inquiry depends “not on the functional relation” between two goods, but rather “on the character of the demand for them.” This query requires the plaintiff to show simply that the two products are commonly sold separately under ordinary market conditions. As a result the “separate products” requirement serves mainly as a screening device to weed out frivolous cases involving goods (such as a right shoe and a left shoe) that are rarely sold separately (e.g., *Reisner* case [tying of car to drive train]; *Areeda and Hovenkamp* 2011, ¶¶1741–51). This definition is in contrast to a more substantive one that a single product should be found when there are “rather obvious economies of joint provision” (*Jack Walters* case).¹ That test would merge a test for efficiency, otherwise a defense, into the definition of separate products.

Ties can come in one-way and two-way varieties. For example, Baskin-Robbins as franchisor might insist that its franchisees sell its own Baskin-Robbins brand ice cream;

¹ Four justices in *Jefferson Parish* preferred this view: “When the economic advantages of joint packaging are substantial the package is not appropriately viewed as two products, and that should be the end of the tying inquiry.” *Jefferson Parish*, 466 U.S. at 40–41.

however, it might willingly sell the ice cream alone to independent retailers or consumers. Two-way ties are sometimes referred to as “bundles.” In a one-way tie we can readily speak of a “tying product” (e.g., the Baskin-Robbins franchise) and a “tied product” (the ice cream). In a two-way tie each product serves both functions. Bundling arrangements often involve more than two products. For example, a patent “package license” may include several hundred patents (e.g., *Automatic Radio* case), and the “blanket license” agreements used in the music broadcasting industry include several thousand compositions (e.g., *Broadcast Music* case). So-called bundled discounts typically operate in both directions. For example, the seller may offer A and B individually at given prices, but a lower price for someone who takes an A + B bundle.

In any event, the tying condition must be something that prevents a customer from purchasing the goods separately or else that creates a disincentive to do so. The orthodox tying form is the “contractual” tie, in which a contract requires the buyer to take the two products together. Legally, tying can also be inferred from an observed practice of refusal to make untied sales (Areeda and Hovenkamp, 2011, ¶¶1755–56). Tying can also be inferred from a discount that attaches when the buyer takes two or more products together (see Hovenkamp and Hovenkamp 2008; 2009), or from a technological design or interoperability requirement that effectively forces the customer to use the two products together even if she is not contractually required to do so. Well-known examples are *Microsoft* (2001), which condemned the blending of Internet Explorer code with the Windows computer operating system code), and *Berkey Photo*, which refused to condemn a camera and film design under which the two would work only with each other (*Berkey Photo*, 1979; see Bohannon and Hovenkamp 2012, 321–22; Evans and Salinger, 2005). If a customer is free without significant constraint to purchase two products separately as well as together, there is no tie.

14.2. STATUTORY COVERAGE AND IDIOSYNCRATIC “PER SE” RULE

The Sherman Act does not explicitly reach tying arrangements, but rather agreements that restrain trade or actions by dominant firms that monopolize markets (15 U.S.C. §1 [contractual restraints on trade], §2 [monopolization]). In 1912 the Supreme Court confronted its first tying case in *Henry* (1912), which upheld the right of a maker of office mimeograph machines to require purchasers to use the machine exclusively with its own ink and stencils. The case was not brought by the buyer as an antitrust action, but rather by the seller as a patent infringement action for sales in violation of the patent license. The Court held that the tying of patented and unpatented products was not an unwarranted extension of the patent.

Congress was not happy with the *Henry* decision. Instead of addressing the legal merits of the Supreme Court’s holding by modifying the Patent Act, however, Congress

placed an antitying provision in the Clayton Act (15 U.S.C. §14), which expanded the antitrust laws to as to prohibit anticompetitive contractual tying. It changed patent doctrine only forty years later.² Congress's displeasure with *Henry* may also be read as its conclusion that a tie should be unlawful even if it threatened no monopoly in the secondary market, given that the stencils and ink in *Henry* were common commodities.

Today the antitrust legality of tying is assessed under four different statutes. Most explicitly, Section 3 of the Clayton Act makes it unlawful for a firm to sell or lease a good subject to a condition or discount requiring the buyer not to purchase goods from a rival, and where the effect “may be to substantially lessen competition or tend to create a monopoly” (15 U.S.C. §14). The statute applies to both patented or unpatented “goods” or “commodities” but excludes services or other intangibles. In addition, Section 1 of the Sherman Act reaches agreements “in restraint of trade,” which includes anticompetitive tying and is not restricted to goods. Section 2 of the Sherman Act condemns tying when it is shown to be an exclusionary practice by a monopolist, or dominant firm. Finally, Section 5 of the Federal Trade Commission Act (15 U.S.C. §45(a)(1)) can also be used against tying, although that provision may be enforced only by the Federal Trade Commission.

During the period from the Clayton Act's passage through the 1970s Supreme Court doctrine was particularly hostile toward tying. The Court's *Standard of California* decision (1949) declared that ties “serve hardly any purpose beyond the suppression of competition.” The Court developed a “per se” rule against them under Section 1 of the Sherman Act “whenever a party has sufficient economic power with respect to the tying product to appreciably restrain free competition in the market for the tied product and a ‘not insubstantial’ amount of interstate commerce is affected” (*Northern Pacif. Rwy.*, 1958).³ This rule differs from the per se rules applied to such practices as naked price fixing because it requires a showing of (1) market power in the tying product and (2) at least minimal impact on competition. Further, it has been interpreted to permit a range of justifications or defenses that are not ordinarily available in per se antitrust cases. The result of these requirements is that, notwithstanding the per se label, most ties today are found to be lawful. In addition, ties can also be condemned under a rule of reason under either Section 3 of the Clayton Act or Section 1 of the Sherman Act. Further, certain unilateral monopolistic practices such as technological ties that do not meet the “agreement” requirements in these statutes can be condemned under the antimonopoly provision, Section 2 of the Sherman Act, which always requires a showing of actual or threatened market power and anticompetitive effects.

² In the 1952 Patent Act Congress provided that the doctrine of contributory patent infringement could not be applied to the sale of a “staple article or commodity of commerce suitable for substantial noninfringing use.” Patent Act, ch. 950, 66 Stat. 811 (1952) (codified as amended at 35 U.S.C. § 271(c)). As a result, Henry's sale of ink capable of other uses could not be the basis of an infringement action.

³ On the meaning of a “not insubstantial” volume of tied commerce, see Areeda and Hovenkamp, 2011, ¶1721.

14.3. MINIMUM CONDITIONS FOR COMPETITIVE HARM; MARKET POWER

Almost everyone agrees that tying is harmless if the markets for the tying and tied product are both structurally competitive. If a competitive firm attempts tying that is undesirable to consumers, they will go elsewhere. As a result, any tying that exists in such markets must make consumers better off. The situation is more complex if a seller has market power in one or both the tying and tied markets.

While market power in the tying product has generally been stated as a legal requirement for unlawful tying, the courts have not always taken the requirement very seriously and have inferred sufficient power from phenomena that indicate very little power at all. The Supreme Court has permitted sufficient power to be inferred from the tying product's "uniqueness" (*Loew's*, 1962), from the fact that the defendant was able to impose a "host" of tying arrangements (*Northern Pacif. Rwy*, 1958), and from the fact that purchasers may be "locked in" by a previous purchase and thus required to buy the seller's aftermarket parts or service (*Kodak*, 1992). A few lower courts have even held that a long-term contract can impose the requisite power (e.g., *Collins*, 1997). Most of these rationales arose out of a deep suspicion as well as a poor economic understanding of ties, which presumed them to be anticompetitive in most cases and thus warranting per se condemnation. While none of these cases has been expressly overruled, their approaches to power are largely ignored or else construed very narrowly.

The *Kodak* lock-in doctrine applies mainly when the defendant requires previous purchasers of its durable good to use its aftermarket parts or service. The firm may be nondominant in the primary market, as *Kodak* was in that case, but the effect of the lock-in doctrine is to create a relevant market for the firm's own brand. The theory, quite simply, is that once a person has purchased a durable good such as a photocopier, "switching costs" are so high in relation to aftermarket value that the firm can be forced to pay monopoly prices for tied specialty products or service. The Supreme Court rejected the defense that a rational customer would engage in "lifecycle" pricing, attributing high aftermarket prices to the overall price. But the Court found two possible exceptions: *first*, there might be a significant group of "myopic" customers who are initially beguiled by a low price on the primary good and ignore the high aftermarket prices. *Second*, a firm might increase aftermarket prices late in a product's lifecycle, perhaps sacrificing some prospective hardware sales but earning more from the "installed base" of customers who have previously purchased. As the quotation marks suggests, *Kodak* has produced its own vocabulary of specialty terms. Nevertheless, the doctrine has been sharply criticized and the courts generally construe it narrowly. For example, they do not apply it when the purchasers had adequate knowledge of downstream prices when they made their initial choice (e.g., *Hack*, 2001).

Finally, the Supreme Court had previously held that the seller's ownership of a tying product covered by a patent (*International Salt*, 1947) or copyright in the motion picture "block booking" cases (*Loew's*, 1962; *Paramount*, 1948) created a presumption of sufficient power, and a few lower courts had extended this presumption to trademarks (e.g., *Siegel*, 1971). The Supreme Court overturned this presumption in its 2006 *Illinois Tool Works* decision, and today market power in tying products protected by intellectual property rights must be established through the ordinary tools for showing power.

At this writing the Supreme Court has not overruled its legal conclusion that ties are unlawful "per se" when tying product power is proven and the tie affects a substantial volume of commerce. The existence of this per se rule has had one very unfortunate consequence: litigants in tying cases have not been required to make a record documenting the true effects of tying, given that those effects were simply presumed. A few passages in *Illinois Tool Works* suggest that the per se tying rule might be ripe for reconsideration.

Market power is a necessary but hardly a sufficient condition for competitive harm from tying. Indeed, at least presumptively a tie does not cause any additional welfare harm beyond that which already exists in the untied monopoly market. Further, two common economic effects, price discrimination and control of double marginalization, are more likely to increase than to decrease welfare from the stand-alone monopoly level. Finally, various benefits of tying, including production or distribution economies or improvements in product quality, can apply to dominant firms and competitors alike.

14.4. MOTIVES AND EFFECTS OF TYING

14.4.1. Rise and Fall of the Leverage Theory

The leverage theory, which originated in patent law in the nineteenth century, expressed a concern that a patent owner could use contracts or conditions to "leverage" more power than the patent itself granted. The best-known statement of the doctrine is Justice Brandeis's conclusion in *Carbice* that a requirement that those using a firm's patented refrigeration container also use its dry ice improperly permitted the seller "to derive its profit, not from the invention on which the law gives it a monopoly, but from the unpatented supplies [which are] wholly without the scope of the patent monopoly" (*Carbice*, 1931).

The leverage theory has nothing to do with the exclusion of any rival (foreclosure). Rather, the harm is based on the threat that the tying monopolist will extract higher prices from consumers. This view was largely exploded by Ward S. Bowman, who observed that when a purchaser wants a combination of two complementary products, the profit-maximizing price is computed by reference to the combination. See Bowman (1957). One can raise the price of the second product only by reducing the price of the

first product. For example, if shoes and laces are complements, a shoe monopolist can extract all available monopoly profits in the price of shoes, and cannot profitably extract more by tying otherwise competitive laces and charging a second monopoly price for them. Consumers attribute value to the combination of shoes plus laces.

The leverage theory is clearly a fallacy in situations where the tying product is monopolized and the tied product is competitive. It is also incorrect in cases where both products are subject to the exercise of some market power, because in these situations the elimination of double marginalization is likely to produce lower rather than higher prices, as we shall see below.

A type of leveraging may occur when a dominant firm ties sequential rather than simultaneous monopolies, but this is clearly something different than Justice Brandeis and other proponents of the leverage theory had in mind. For example, a firm such as Microsoft, seeing that a rival's Internet browser with operating system capabilities poses a future threat to its own operating system, might tie its operating system and its browser in order to keep that threat from being realized (*Microsoft*, 2001). Even in this case, however, the competitive threat resembles foreclosure of rivals more than pure leveraging. See Bohannon and Hovenkamp (2012, 25–26, 269); Whinston (1990).

14.4.2. Price Discrimination

In a variable proportion tie, consumers purchase one unit of the tying product and amounts of the tied product that vary with their use of the tying product. For example, printer manufacturers will frequently tie their printers to their own ink cartridges. Consumers who do more printing must purchase more ink cartridges, but most users buy only one printer. In nearly all litigated cases these tying arrangements involve a price reduction from the nontied level on the tying product, but a markup on the price of the tied product. Indeed, often the tying product is priced at below cost or given away. See Hovenkamp and Hovenkamp (2010). This pricing strategy is frequently referred to as “metering.” A more technical account is presented in Schmalensee (1981), who finds that such arrangements may often be welfare increasing.

Price discrimination occurs when the ratio of the average price to marginal cost varies among buyers of the same product. If marginal cost is the same for all customers, then price discrimination occurs whenever two consumers pay different unit prices for the same product. When demand for the tied product varies significantly among buyers of the tying product, variable proportion tying may be used to discriminate among buyers with different intensity levels. By shifting profits to the tied sales, the firm earns greater profits from higher intensity users. Moreover, by reducing the price of the tying good the firm can obtain a profit from lower intensity buyers who would not have purchased the product at all under separate provision.

Because all consumers face the same price schedule, metering is an example of second-degree price discrimination. It is important to note that the object of this price discrimination is the *combined use* of the two products. Individually, both the tying and the

tied products are sold at the same nominal price to all. For example, in a tie of printers and ink cartridges it is the price of *printing* that is discriminatory. Of course, the combined use of the tying and tied products will always have a price schedule of this form, even under separate provision. However, in that case no single firm can utilize this property to discriminate, and so the resulting prices differ from the optimal discriminatory prices.

To illustrate suppose that a printer monopolist faces costs of 10 per unit and that the cost of cartridges is 2. Cartridges are sold competitively. The printer maker could sell the printer at a stand-alone profit-maximizing price of 14, earning 4 on each sale, for a return of 40%. It would sell the cartridges at the competitive price. Instead the monopolist sells the printers at its cost price of 10 and ties cartridges, for which it charges 4. The first thing that will happen is that more buyers will come into the market for printers. Output will not rise all the way to the competitive level in this illustration because each customer needs at least one cartridge, so even the lowest intensity user will end up paying 14 rather than the competitive price of 12. Returns (right column in the table below) are then as follows for customers requiring different numbers of cartridge (second column):

Printer price/cost	Number of cartridges	Cartridge price/cost	Total price/cost	Return
10/10	1	4/2	14/12	16%
10/10	2	8/4	18/14	28%
10/10	3	12/6	22/16	37.5%
10/10	4	16/8	26/18	44%
10/10	5	20/10	30/20	50%
10/10	10	40/20	50/30	67%
10/10	20	80/40	90/50	80%

Such differences are robust over all situations in which tying involves a transfer of part of the available monopoly overcharge from the tying to the tied product. In the above example, printing costs per page actually decline as usage increases, because the printer price is amortized over more copies while the cartridge cost is constant. However, the seller earns higher returns per customer as usage increases.

The welfare effects of variable proportion tying are generally ambiguous. We can safely assume that total profits—the sum of tying and tied good profits—are higher under tying. Otherwise the seller would not tie. However, some consumers benefit from tying, while others are injured by it. As figure 14.1 illustrates, we can divide consumers into three groups: low, medium, and high intensity. Low-intensity consumers are those with relatively low demand who are unwilling to pay the higher tying good price that arises under separate provision. They purchase the goods only under tying and are thus clearly benefitted by the tie. Medium intensity consumers are those who buy the products under both pricing regimes, but who receive more surplus under tying. Because the marginal cost of consumption (the tied good price) increases, these buyers consume less under tying. But the reduction in the tying good’s price is sufficiently large to overcome

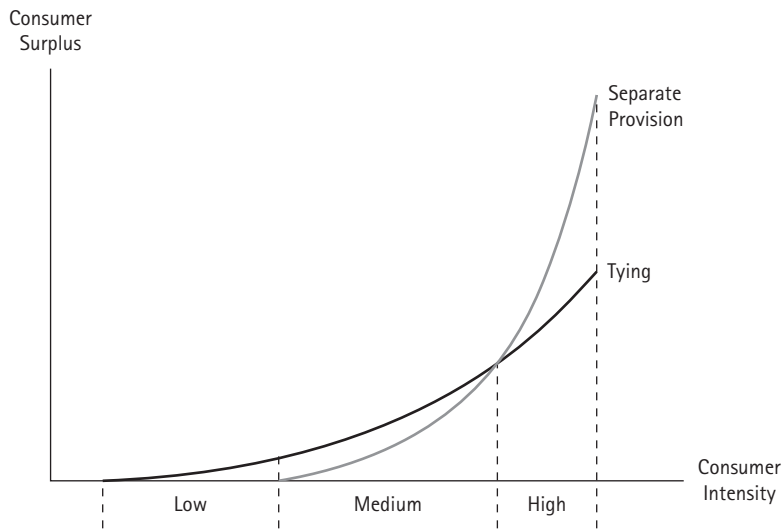


FIGURE 14.1 Welfare Effects of Variable Proportion Tie

this decline, and the result is a net increase in consumer surplus. Finally, high-intensity consumers are those who achieve less surplus under tying. These consumers have relatively high demand, and the price of the tying good makes up a relatively small fraction of their total consumption expenditure. Unlike medium-intensity buyers, the reduction in the tying good price is insufficient to overcome the negative impact of an increased tied good price. The net effect of tying on consumer welfare is the aggregation of the effects on all consumer types.

Given the varied surplus effects depicted in figure 14.1, the overall effect of tying on welfare generally depends on the distribution of consumer intensity levels within the population. However, three additional factors can strongly affect the welfare impact of variable proportion ties. These are the impact of tying on producer costs of the tying product, the degree of competition in the tied market, and economies of scale in the tying or both markets. If the marginal cost of the tying product is relatively high—meaning that it is close to the maximum willingness to pay among potential buyers of the tying good—they tying is more likely to increase consumer welfare. In this case, tying permits the seller to price the tying good near or below cost, which results in many more consumers entering the market. In fact, if this marginal cost is sufficiently high, then tying may be the *only* pricing arrangement in which sales of the tying product are profitable. For example, a device such as a smartphone may require a price of \$400 if sold alone, but may be included without charge or at a nominal price when bundled with a two-year service contract. Returns on the phone will depend on consumer usage.

The level of competition in the tied market also affects the impact of tying. In particular, consumer welfare under separate provision ordinarily decreases as tied market competition diminishes. Under tying, however, consumer welfare is largely unaffected by the level of tied market competition. The tying product cannot be used with competing

versions of the tied product in any event, so the tying firm's pricing decision is independent of tied market prices. Thus a lack of tied market competition will tend to ease the conditions under which tying improves consumer welfare.

The third factor is the extent of scale economies in production of the tying product and, occasionally, the tied product. Because the price cut in the tying product results in greater tying product sales, more units of the tying product will be produced. If fixed costs are substantial, as they often are for manufactured products and particularly for those with a significant R & D component, then the output increase that results from tying will likely produce a lower profit-maximizing price quite aside from the pricing shift to the tied product. The output impact on the tied product is more ambiguous. On the one hand, high-intensity users consume less of the tied product because they pay more for it under tying. On the other hand, low-intensity users would not be in the market at all under separate provision. Any demand that tying creates among them constitutes an output increase. Further, the tie itself switches tied product output away from rivals and toward the tying firm. If the net result is an output increase, then economies of scale may reduce the costs of the tied product as well. In sum, while precise calculation may be impossible, there are good reasons for thinking that price discrimination ties increase aggregate consumer welfare as a general matter.

14.4.2. Foreclosure

The dominant defense of antitrust tying doctrine today is that ties may unreasonably foreclose, or exclude, rivals, particularly in the tied product market. For example, once a major hospital enters an exclusive arrangement with an anesthesiologist, rival anesthesiologists will be denied the right to practice at that hospital (e.g., *Jefferson Parish*, 1984), or once Microsoft bundles its Windows operating system with its Internet Explorer browser, rival browser makers may find it more difficult to sell their product (*Microsoft*, 2001).

Several writers, particularly from the Chicago School, have been highly skeptical of foreclosure claims. *First*, tying may require no more than a realignment of purchasing patterns. For example, once an independent anesthesiologist loses the right to practice anesthesiology at a particular hospital because of its tie, she will have to practice at a different hospital, but market competition need not be affected. *Second*, the critique of the leverage theory also applies in foreclosure cases: that is, even assuming that tying forecloses rivals, it still does not change the fact that the profit-maximizing price of the tying-tied combination is no higher than it was before. See Bork (1978, 231–45).

In all events, foreclosure requires an assessment of the downstream market, something that cannot be inferred from upstream market share. For example, even if the patent monopolist of a salt-injecting machine for canned foods has a 90% market share in such machines, foreclosure in the salt market must be assessed against the full range of uses for salt (e.g., *Int'l Salt*, 1947). Use through the salt-injecting machine may represent only a small proportion. Many ties, particularly in the franchise and aftermarket parts

contexts, have involved relatively common commodities with a wide variety of uses unrelated to the tying product.

Today the rise of transaction cost economics and greater sensitivity toward the cost of moving resources has forced relaxation of the strict Chicago School view. See Hovenkamp (2010). Even if tying does not lead to an immediate increase in prices, it can serve to deter or delay entry by rivals. Before this can occur, however, actual exclusion must be shown and entry or mobility barriers must be shown to be significant. For example, the OS/browser tie in *Microsoft* very likely delayed the development of independent browsers with OS capabilities.

These barriers to entry or mobility can emanate from a variety of sources, including intellectual property rights or other government-created licensing restrictions, differential economies of scale in the markets for the tying and tied products, or reasons related to asset specificity and risk that are commonly associated with barriers to entry. For example, once excluded from practicing his profession by the dominant hospital's anesthesiology tie, an independent anesthesiologist may be prevented from building his own hospital by government-imposed regulatory requirements, different scale economies as between hospitals and anesthesiological practice, or else the simple fact that a hospital is a costly specialized asset that cannot readily be redeployed in the event of failure. Of course, none of these explain why the hospital would be able to charge higher prices when the independent anesthesiologist had been excluded from the anesthesiologist market. Even a monopoly hospital would generally profit by procuring inputs of the highest quality and at the lowest cost, and once its profit-maximizing price is established it will not be able to extract more profits simply by tying one of these inputs.

More realistic foreclosure fears arise in changing markets where single-level entry threatens to turn into two-level competition, thus eroding the dominant firm's position. In *Microsoft* (2001) the D.C. Circuit found this to be such a case. Because the Netscape browser contained operating system features, Microsoft CEO Bill Gates feared that it could eventually "commoditize" the operating system market by creating competition there. The Internet Explorer tie was designed to switch customers away from Netscape in order to suppress that threat.⁴ In other situations tying may deprive rivals in the tied market of output that is necessary for efficient production, with the effect of raising prices in the secondary market. Finally, the use of dominant firm tying to create a two-level monopoly can raise entry barriers by requiring entry at two levels rather than one. This can be particularly burdensome when differential scale levels apply at the two levels. See Areeda and Hovenkamp (2011, ¶1705).

⁴ See 84 F.Supp.2d 9, 29 (D.D.C. 1999) (district court findings of fact noting Gates's email to employees about Netscape threat "to commoditize the underlying operating system"). See Areeda and Hovenkamp (2011, ¶¶1704, 1706). The Ninth Circuit has held that tying claims alleged under the rule of reason should be dismissed in the absence of any allegation of foreclosure. *Brantley v. NBC Universal, Inc.*, 675 F.3d 1192 (9th Cir. 2012).

14.5. TYING OF COMPLEMENTS AND DOUBLE MARGINALIZATION

Horizontal double marginalization occurs when two or more complementary products are sold by separate firms and each one individually maximizes at prices above marginal cost. As a result, purchasing under separate provision also entails a separate markup on each good. Such arrangements frequently result in prices whose sum exceeds the price that would be set by a single firm who sells the products together. By eliminating such “double marginalization,” tying can benefit consumers. Further, total profits will tend to be higher under tying, as a single firm will internalize the (negative) pricing externality of each good. This provides a clear justification for tying that is independent of any production efficiency gains that might result from joint provision. Two firms can achieve similar results by coordinating their output and pricing, but this arrangement will necessarily involve tying in any event, as coordination will require joint sales.

The elimination of double marginalization is always sufficient to justify tying when the goods in question are mutually perfect complements, meaning that each good is valueless without the other. For example, an automobile consists of many individual parts that are essential to the final product, but which are independently useless to most consumers. If consumers purchased these parts from separate firms, then each part would be marked up independently. The total markup would be considerably higher than the single markup by a manufacturer who “ties” all of the parts into a finished car. With joint provision, the firm does not distinguish between the profits earned on separate parts; its only concern is the total profit earned on the car. The tying of mutually perfect complements virtually always increases both seller profits and consumer welfare. These results are formalized in the following simple example.

Consider two mutually perfect complements A and B . Each good i is produced at constant marginal cost $c_i \geq 0$. Market demand for the pair (one unit of each good) is $Q(P) = \alpha - \beta P$, where P denotes the price of the pair and $\alpha, \beta > 0$. First consider a single firm who ties the two goods, but does not achieve any production efficiencies (i.e. the cost of producing the tie is $c_A + c_B$). The firm sets a tie price P_T to maximize profits, which are given by $[P_T - c_A - c_B]Q(P_T)$. Solving the firm’s optimization problem yields an optimal tie price of

$$P_T^* = \frac{\alpha + \beta(c_A + c_B)}{2\beta}$$

Now consider a situation in which A and B are produced by separate firms. Each firm $i \in \{A, B\}$ sets the price of i , denoted P_i , taking its rival’s price as given. Thus, given P_B ,

firm A chooses P_A to maximize $[P_A - c_A]Q(P_A + P_B)$. Solving for the Nash equilibrium yields prices of

$$P_A^* = \frac{\alpha + \beta(2c_A - c_B)}{3\beta}, \quad P_B^* = \frac{\alpha + \beta(2c_B - c_A)}{3\beta}$$

Comparing the prices of the A – B pair between the two scenarios, we find that $P_T^* \leq (P_A^* + P_B^*)$ if and only if $\alpha \geq \beta(c_A + c_B)$, which is true if and only if $P_T^* \geq (c_A + c_B)$. Thus, whenever a firm would actually choose to tie, it must be the case that tying leads to a lower price for the pair. This implies that consumer welfare increases. Also, it follows from the fact that $P_T^* \neq (P_A^* + P_B^*)$ in general that total profits are higher under tying. Thus the tying of mutually perfect complements unambiguously increases total welfare.

If a tie includes an imperfect complement—meaning that at least one good has value independently of the others—then the elimination of double marginalization may not be sufficient to infer a welfare improvement. However, this is not because double marginalization ceases to be inefficient in these cases. It is still true that tying reduces the price paid for the tied-up package of goods, and that total profits increase, benefiting both the seller and those purchasers who actually want the entire package. The difference in this case is that some consumers may wish to buy only the tying product alone—something that does not happen when the goods are mutually perfect complements. Tying may injure these consumers, as they may be forced to buy unwanted items in order to obtain the products they desire. The extent of this harm will tend to decrease as the level of complementarity among products increases. For sellers, situations of this type are more readily addressed by bundled discounts rather than tying. In a bundled discount those customers who want only one component pay the maximizing price of that item; but sellers who prefer the bundle can obtain a price that is lower than the summed prices of sales by two different firms. For this reason one might expect to see bundled discounts as an alternative to tying in situations where the bundled goods are often but not invariably used together. The price to the stand-alone buyers will depend on the demand elasticity the seller faces. In some cases the buyers who prefer the primary product alone may value it more highly than the bundle buyers, and in some cases less. As a result competitive harm cannot be inferred from the fact that the seller increases the price of the primary product when it introduces a bundled discount.

The above double-marginalization arguments may not apply straightforwardly to ties involving products used in variable proportions, such as printers and ink cartridges. Joint maximization may still occur at a lower price than when sales are made by separate sellers. As developed previously, in variable proportion situations the seller is typically engaged in price discrimination by reducing the price for the fixed component (e.g., the printer) and increasing the price of the variable component (the ink). As a result, it is no longer the case that tying benefits all consumers who wish to buy all of the tie's components. Rather, tying reduces the total price to consumers who desire

relatively few variable units, while increasing the total price for higher intensity consumers. As a result, the double-marginalization effects of variable proportion ties are more complex.

14.6. ECONOMIES OF JOINT PROVISION

14.6.1. Generally

Economies are always relevant to tying law, although how they are used depends on one's definition of the "separate products" test. Under one version of the test two goods will be treated as a single product if tied provision is cheaper than provision by two different firms. In that case the plaintiff would have to show separate products by proving the absence of economies. Under the dominant test that five justices of the Supreme Court approved in *Jefferson Parish*, however, proof of economies does not enter at the definitional stage but rather operates as a defense to the tie. This means that the burden of proving economies normally lies with the defendant.

Virtually any type of cost savings can justify a tie, including manufacturing economies, distribution economies, economies in R & D, and purely transactional economies such as risk reduction or quality control. An example of the first is the *Times-Picayune* case (1953), a government challenge to a newspaper's requirement that classified advertisements be placed simultaneously in its morning and evening editions. As the record in that case developed, the advertisements were typeset manually and under the tie could be set a single time for both newspapers. This cost savings could not be achieved by any mechanism other than requiring identical morning and evening advertising sections.

Many of the economies produced by ties are economies of scope, or the reduced costs that attend producing two goods or services together rather than separately. The phrase "economies of joint provision" is useful, because not all economies of scope justify tying. For example, significant economies of scope justify producing beef and cowhide together, or lumber and sawdust. But once a firm has produced these two goods together, they can and typically are distributed separately. By contrast, the typesetting in the *Times-Picayune* advertising case could not produce the economies in question unless buyers were required to purchase advertising in both newspapers together.

The joint provision of distinct products will frequently result in efficiency gains that make tying beneficial for both firms and consumers. These efficiencies typically involve reduced costs or improved product quality. Production cost reductions occur when the production of one good allows another to be produced more cheaply, or when there is a common fixed cost that can be spread across multiple production processes. Improvements in product quality typically arise when joint production allows for increased compatibility between the goods, making their combined use easier or more enjoyable.

14.6.2. Production Cost Efficiencies

When joint production of two or more different goods is less costly than separate production of each good, we say that joint production exhibits *economies of scope*. Formally, consider two products A and B , let $C(q_A, q_B)$ denote the total cost of jointly producing q_A units of A and q_B units of B , where $C(\cdot, \cdot)$ is nonnegative-valued and increasing in both situations. Then joint production of A and B exhibits economies of scope at quantities (q_A, q_B) if $C(q_A, q_B) < C(q_A, 0) + C(0, q_B)$. This may arise because enabling production of one good reduces the marginal cost of producing another, or because total fixed costs are lower under joint production.

Perhaps the most common source of scope economies are *joint cost savings*, which arise when there is a shared input or production process that can be “spread” across the production of different products. Suppose that θ is a costly input used in the production of both A and B , and let $\theta^*(q_A, q_B)$ be the quantity of θ required to jointly produce q_A units of A and q_B units of B . In general, θ may be a fixed or variable input, and it can be either tangible (e.g., a plant or machine) or intangible (e.g., a patent). Then the joint production of A and B exhibits joint cost savings at (q_A, q_B) if $\theta^*(q_A, q_B) < \theta^*(q_A, 0) + \theta^*(0, q_B)$. For example, Internet and cable television can be delivered by the same wires, making the cost of joint provision much lower than if two companies offered the services separately and each one supplied its own wires. The classic production assembly line is another example. Adding components as a good travels down a single line may be much cheaper than subjecting the good to repeated trips down different lines.

In many of these cases a tie is the *only* way in which a firm can capitalize on joint cost savings. That is, the savings achieved by tying could not be achieved by separate sales even if both goods are produced by a single firm. For example, consider a pharmaceutical firm that can produce capsules of a cough suppressant and a decongestant. See Evans and Salinger (2007). The per-unit cost of each medication is 10 cents; the cost of buying and filling a capsule is 50 cents. Under a tying arrangement for a multisymptom capsule the firm fills each capsule with both drugs, for a total cost of 70 cents per unit. Under separate production of single-symptom capsules, however, each drug is encapsulated separately, and the total cost of the drug combination is \$1.20. Thus the production process exhibits joint cost savings, which occur because encapsulation is a shared cost. Moreover, these savings would not arise if a single firm sold the drugs separately unless they could form a production joint venture and make the multisymptom capsules.

14.6.3. Quality Control Efficiencies

Tying frequently produces quality improvements when achieving compatibility between products is costly and highly sensitive to production specifications. This occurs when the compatibility between products is (1) complex and subject to considerable variation; and (2) essential to the value of one or more products. In these

situations, the direct effect of joint production is to reduce the costliness of ensuring compatibility; quality improvements arise indirectly in response to this cost shift. For example, computer operating systems typically include a number of independent programs or subroutines that are developed by the same manufacturer. Clearly the value of each tied program is highly dependent on its compatibility with the user's operating system. By jointly producing these programs, the producer can capitalize on its familiarity with its own operating system. This is particularly important when product compatibility depends on technological specifications that are not fully observable by a producer's rivals.

A great many antitrust challenges to ties have arisen in the franchising industry, particularly for fast foods. Monopoly in these cases is almost never in prospect in either market. The tying markets for the franchised brands or systems are nearly always competitive, and the tied products are typically common commodities such as spices, cookies, pizza dough, or general purpose real estate rentals. As a result, anticompetitive foreclosure is virtually out of the question. The plaintiffs are almost invariably franchisees rather than rivals, and the claims are for overcharges in the tied product.

One robust explanation for these ties is price discrimination, as outlined previously. In addition, however, franchise ties are important for quality control, as an alternative to self-distribution. Some franchisors such as Baskin-Robbins make their own ice cream and have chosen to sell it through independently owned franchisees. Others, such as McDonalds, produce very little product themselves. In both cases, however, the franchisor has a strong interest in maintaining high quality and uniformity across all of its stores, while individual franchisees may have incentives to cut costs by buying cheaper products, free riding on the strength of the franchise as a whole. This is particularly likely when the franchise as a whole depends on repeat business but individual franchisees serve transient customers that they are likely to see only once. See Blair and Lafontaine (2005); Klein and Saft (1985).

The *Collins v. Dairy Queen* case (1999) involved DQ's insistence that franchisees use Nabisco cookies in its "Blizzard" ice cream concoctions rather than cheaper cookies made by generic bakeries. In *Queen City* (1997) the Domino's pizza franchisor required its franchised stores to use its particular pizza dough. Either price discrimination or quality control, or perhaps both, are likely explanations for these ties. Monopolies of either cookies or pizza dough was not in prospect.

14.6.4. Package Licensing and Similar Intellectual Property Bundles

Package licensing of patents creates significant opportunities for cost savings, particularly if the patents are complements. The transaction costs of negotiating license fees over groups of patents, of offering standardized packages, or of monitoring to ensure that licensees are using only technology that they have actually licensed can all be reduced by package licensing. See Bohannon and Hovenkamp (2012, 345–48). Relatedly,

“blanket” licensing of recorded music can enable radio stations and other broadcasters to achieve instant indemnified access to performance rights without individual negotiation. The value of such licenses would largely be lost, however, if individual licensees could willy-nilly designate small portions of them and obtain a pro rata price reduction. Thus in *Broadcast Music* (1982) the court rejected a tying challenge to a jukebox blanket licensing provision by a bar that wanted to play only country and western music at a reduced license price. The court found that determining which songs were included in the smaller license and monitoring to ensure that the bar did not cheat would actually cost more than providing the full blanket license.

14.7. SELF-DISTRIBUTION ALTERNATIVE TO VERTICAL INTEGRATION; RISK-SHARING

A great many tying claims arise in the context of franchise and dealership networks when the manufacturer forces a dealer or franchisee to take certain products for resale. An automobile manufacturer may require dealers to sell slower moving lines. A fast-food franchisee may require individual retailers to sell specific products supplied by the franchisor. In these cases the independent dealership or franchise arrangement is a substitute for the manufacturer’s own vertical integration into retailing. That is, instead of selling its own vehicles through wholly owned dealerships the manufacturer enters long-term arrangements with locally owned independent dealers. In these cases the arrangement plus the tying requirement acts as a substitute for self-distribution. Such arrangements also operate as a form of risk-sharing, converting the dealer from an employee to an entrepreneur with a significant investment in the local business. Or to say this somewhat differently, the contractual dealership arrangement plus the tie is nothing more than a substitute for a single firm. That observation does not necessarily end all legal inquiry, because the supplier may still be in a position to impose harmful consequences on its dealers, just as a harsh employer can impose such consequences on its employees. It very largely ends the *antitrust* inquiry, however, because it is difficult to see how the franchise arrangement can be more harmful to competition than outright ownership of retail outlets.

Variable proportion tying may benefit businesses or consumers who are uncertain of the value of a particular good. Specifically, a consumer may worry that she will use the tying product too infrequently to justify its purchase. If the consumer is risk averse, then this risk may deter her from purchasing the tying product even if her *expected* surplus is positive. By reducing the price of the tying product, tying helps to mitigate this risk by increasing the surplus she receives in the event that her future demand for the tied product is low. Economically speaking, the tie has the effect of reducing the purchaser’s fixed cost investment (e.g., the durable and costly printer) and increasing variable costs (e.g., ink). By contrast, if her future demand turns out to be high, then she may achieve less

surplus under tying. Thus tying serves to reduce the “spread” between the consumer’s possible surplus realizations. A risk-averse agent may prefer this trade-off.

We can illustrate this effect using figure 14.1. Suppose that a consumer is unsure about her demand for a product such as a printer that uses ink cartridges. If she buys the tying product and turns out to be a low-intensity user, then she could receive negative surplus under separate provision (because of the higher printer price) and positive surplus under tying. She could have garnered zero surplus by not buying anything, and thus she regrets buying the tying product under separate provision, but not under tying. If she turns out to be a high-intensity user, then she receives more surplus under separate provision, but even her tying surplus is positive. That is, she does not regret purchasing the tying product in either case. If the agent is risk averse, then avoiding a regrettable situation is valuable in its own right, and so she may prefer tying even if her *expected* surplus is higher under separate provision. This illustrates a way in which variable proportion tying may improve consumer welfare that is independent of price discrimination effects.

14.8. TYING IN HIGH-TECHNOLOGY MARKETS; “MISUSE”

Technology-rich markets are particularly prone to tying because networking and interconnection are frequently major components in such markets. See Bohannon and Hovenkamp (2012, ch. 2); Liebowitz, Stan, and Margolis (2007). As products become more complex, quality control issues loom larger. Further, as products are more specialized, aftermarket goods must be individually tailored as well. At the same time, however, technology can provide opportunities for ties that are anticompetitive because they limit competitor entry or expansion, or in some cases because they restrain innovation.

The earliest tying cases in the federal courts were not antitrust challenges. Rather, they were patent infringement cases brought by sellers in which the defendant defended by arguing that the tying requirement was not enforceable under the Patent Act because the tie was an improper attempt to expand the scope of the patent “monopoly.” The Supreme Court rejected this defense in the *Henry* case (1912), but fairly consistently accepted it in the *Motion Picture Patents* (1917) and later decisions. The antitrust law of tying actually evolved out of these patent “misuse” cases, where the law was entirely judge-made with no clear statutory authorization. See Bohannon and Hovenkamp (2012, ch. 10). The full-blown modern doctrine of patent misuse did not emerge until the 1940s, principally in the *Morton Salt* case (1942). In that case patentee Suppiger owned a patented machine that injected salt into canned foods. Its license agreement required users of the machine to purchase their salt from Suppiger. When Suppiger brought a patent infringement suit against Morton for selling an infringing

machine, Morton raised the tie as a defense. The Supreme Court held that Suppiger lost the right to enforce its patent as long as it was tying, even though Morton was not injured by the tie. This loss of enforcement right should persist, the Court held, until the misuse was “purged”—that is, until Suppiger should stop assessing or enforcing the tying requirement. The decision did not rest on any finding of market power or exclusionary effects, but only on the proposition that the tying of unpatented staples improperly extended the patent’s boundaries. The Fourth Circuit extended this rule to copyrights in its *Lasercomb* decision (1990).

As the doctrine of misuse evolved it became narrower than antitrust liability in some ways but broader in others. It is narrower in the very important sense that it operates almost exclusively as a defense to a patent or copyright infringement suit (e.g., *Lasercomb*, 1990).⁵ There is no affirmative cause of action for misuse, and thus no treble damages or attorneys’ fees such as successful antitrust plaintiffs can recover. Misuse is also broader, however, in that it has been held to reach substantively to practices that would not be antitrust violations, does not have a market power requirement except in the case of patent tying arrangements,⁶ and can provide the very draconian remedy of making a misused patent unenforceable against everyone, including people who are not harmed by the misuse.

The issue of misuse law’s substantive coverage has proven quite problematic, and several decisions have tried to restrict its reach by limiting it to situations that would actually violate the antitrust laws (e.g., *USM*).⁷ Other decisions have found that misuse reaches further, although the modern trend is to apply misuse doctrine restrictively (e.g., *Princo*, 2010; see Bohannon and Hovenkamp 2011).

Misuse is entirely a creature of IP policy, not antitrust law. While intellectual property law shares with antitrust a concern for maintaining competition, its principal concerns are with innovation and protection of the public domain, or the realm of ideas and expressions that are not covered by IP laws and for which access by future innovators is so essential. As a result, a good case can be made that the substantive coverage of misuse law should include antitrust violations but also unreasonable restraints on innovation or denials of access to the public domain that antitrust law does not reach. However, the ordinary remedy should be limited to an injunction against the misuse. See Bohannon and Hovenkamp (2012, ch. 10).

⁵ One exception to the rule that misuse is asserted as a defense to an IP infringement claim is *Brulotte* (1964), where the patentee brought a state court breach-of-contract action when the purchaser stopped paying royalties on use of a machine after its patents expired; the Supreme Court permitted a misuse defense.

⁶ Since 1988 the Patent Act has provided that a patent tie cannot be misuse unless the patentee has market power in the tying product. 35 U.S.C. §271(d)(5).

⁷ But see *Assessment Techs.*, 2003 (Judge Posner, suggesting that copyright misuse might reach beyond antitrust).

14.9. REMEDIES, MAINLY DAMAGES

Both the government and private plaintiffs are entitled to obtain an injunction against a tie that has been found unlawful. The more interesting question concerns antitrust treble damages, which are required by Section 4 of the Clayton Act to be based on the injury that the plaintiff sustained. Some tying plaintiffs are rivals in the tied product market who have been foreclosed by the tie. This was true, for example, in the *Jefferson Parish* case. In those cases damages for successful plaintiffs are based on lost profits or loss of business value, as in most antitrust cases with competitor plaintiffs (e.g., *Moore*, 1982).

When the plaintiffs are consumers the damages inquiry is particularly complicated by the fact that many consumer ties are brought as class actions, and the analysis above makes clear that a tying arrangement can affect consumers in very different ways. For example, some purchasers of a variable proportion tie in the franchise or aftermarket product setting may be injured by the tie while others are benefited.

Historically consumer damages for tying were based on overcharges on the tied product alone (e.g., *Siegel*, 1971).⁸ That number is clearly excessive, because ties almost always involve an increase in the tied product price accompanied by a reduction in the tying product price, sometimes all the way to zero. As figure 14.1 illustrates, lower intensity customers in such cases are benefited from the tie, sometimes a very great deal. As a result several courts have adopted an alternative suggested in *Areeda and Hovenkamp* (2007, ¶340c) that damages be based on the *net* overcharge (e.g., *Kypta*, 1982). For example, if tying results in a \$3 price cut in the tying product and a \$5 price increase in the volume of tied product that is purchased, the correct measure of damages should be \$2, not \$5.

Tying may increase a buyer's surplus, however, even if the cost of her original bundle (the bundle she purchases under separate provision) increases. We can see this in figure 14.2, which shows the effect of a tie that increases the tied product's price from P to $P + a$. The quantities $Q(P)$ and $Q(P + a)$ denote the agent's demand for tied units under separate provision and tying, respectively. Assuming tying reduces the price of the tying product by some amount $b > 0$, tying increases the cost of the agent's original bundle by $A + B + C - b$ (this will be negative for some consumers). However, the agent's surplus falls by only $A + B - b$, because region C was not achieved as surplus under separate provision. This implies that the agent's surplus falls by less than the increase in the cost of her original bundle. For example, if the cost of the agent's optimal bundle is unchanged by tying, then she receives more surplus under tying. Similarly, it is possible that the cost of her original bundle increases slightly, and yet she achieves more surplus under tying. As such, the change in the cost of an agent's original bundle is not a strong indication of

⁸ The court directed, however, that an offset should be provided for the cost of a reasonable franchise fee.

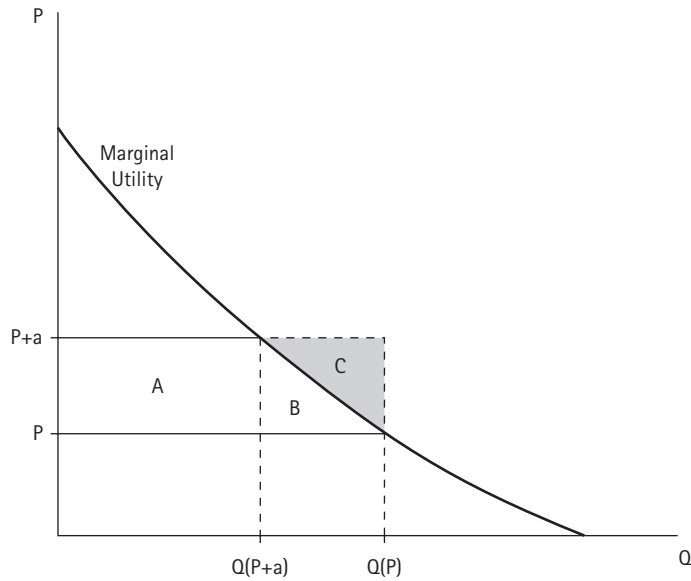


FIGURE 14.2 Relation Between Bundled Price and Consumer Harm

how her surplus is affected by tying. Damages measured by the net overcharge on the tying and tied product are therefore likely to be excessive as well.

The plaintiff who claims that it was injured, not by an overcharge, but rather by the requirement that it purchase a product that it did not want at all, has not suffered anti-trust harm. Although such a buyer's welfare may be lower, that injury does not result from a reduction of competition unless an alternative product was actually foreclosed from the market.

14.10. CONCLUSION

In the vast majority of cases tying arrangements increase welfare, whether measured under a general welfare or a consumer welfare test. Competitive harm is a threat in a very few situations involving actual market foreclosure or the use of ties to enable dominant firms to retain their market position as one technology rolls into the next. As a result, the so-called per se rule for tying is wrongheaded, and ties should be addressed under the rule of reason, with fairly substantial proof requirements on challengers.

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