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Herbert J. Hovenkamp
University of Pennsylvania Law School

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ANTITRUST AND THE DESIGN OF PRODUCTION[†]

Herbert Hovenkamp*

I. Introduction

What should be antitrust's role in regulating the design of production, or the mechanisms by which products and services are conceived, designed and built? Should it be heavy handed, particularly when it discovers a link between design and monopoly? Or should antitrust policy generally keep its hands off, trusting that market forces will do better than the courts? Traditionally, antitrust has treated practices differently depending on whether they were characterized as involving design or production on one hand, or distribution on the other. Distribution has received harsher treatment. The traditional per se rules for vertical restraints, particularly resale price maintenance and tying, were thought to be concerned with restraints on distribution.

Although the courts do not view it that way, even per se unlawful price fixing among rivals is a restraint on distribution rather than production. That is, naked price fixing assumes a product that has already been designed and built, and the question at issue is what should be each firm's output, or the price charged to buyers. At the same time, however, many price agreements among rivals are in fact a part of design or production rather than distribution. Good examples are the Supreme Court decisions in *Trans-Missouri*,¹ *Topco*,² *Broadcast Music*,³ and *Maricopa*.⁴ In three out of four of these decisions the United States Supreme Court reached the wrong result because it did not realize that the practice it was examining was a part of production design.⁵

A large amount of resale price maintenance, tying and other vertical agreements are also design or production practices, some of which use price as a facilitator. For example, someone who examines a tying arrangement and sees only the prices might readily conclude that the practice reduces welfare because it deviates from some pricing norm associated with competition, such as marginal cost. But for tying arrangements that is almost never the right question to ask. Rather, it is how the tie reflects the production

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*James G. Dinan University Professor, Penn Law and Wharton Business, University of Pennsylvania. Thanks to Erik Hovenkamp for reading and commenting on a draft.

¹United States v. Trans-Missouri Freight Ass'n, 166 U.S. 290 (1897).

²United States v. Topco Assocs., Inc., 405 U.S. 596 (1972).

³Broadcast Music, Inc. v. CBS, Inc., 441 U.S. 1 (1979).

⁴Arizona v. Maricopa Cty. Med. Society, 457 U.S. 332 (1982).

⁵See discussion *infra*, text at notes __.

or development strategies of the firms involved. Nearly all ties come in one of two categories: they either incentivize innovation or else give effect to joint entrepreneurial risk taking.⁶

Antitrust policy has a much greater role to play when the practice in question is properly defined as distribution rather than production. Too often, however, antitrust policy has mislocated the line between them. Much of what it characterizes as “distribution” is really a part of design or production.

The federal antitrust laws are very general, reaching nearly every American market and almost every practice that can be characterized as anticompetitive. Nevertheless, almost nothing in their language suggests a strong involvement with product design or innovation. The Sherman Act never mentions technology, patents, innovation, or anything closely associated with them.⁷ It speaks only of restraints on trade and monopolization – two phenomena strongly associated with price and output. The Clayton Act, passed a quarter century later, mentions patents a single time when forbidding unreasonably exclusionary vertical agreements.⁸ Even that statement is not concerned with design but rather with the way that completed products that might embody patents are distributed.

Nevertheless, the highly general antitrust laws remain as one of the most important federal controls over how technology is developed and deployed. Questions about technology have been an important portion of antitrust law, including the many decisions dealing with the relationship between federal antitrust and the patent or other intellectual property regimes.⁹ These many confrontations with technology include many of antitrust law’s most important accomplishments, as well as some of its most disheartening failures.

Firms redesign their production in order to increase or preserve their market share in the face of changing competition or consumer taste, both of which are often driven by changes in technology. With this in mind, it is important to recall a few premises have largely become uncontroversial. One is that pricing that seems noncompetitive in the short run is an inherent feature of technological progress. This is largely a function of two things: incentive effects and fixed costs. Firms innovate in pursuit of profits. If they succeed, short run prices will be higher than short run costs. Depriving firms of these

⁶See discussion *infra*, text at notes ___.

⁷15 U.S.C. §§1,2.

⁸15 U.S.C. §14 (making it unlawful to sell or lease a good, “whether patented or unpatented,” on the condition that the purchaser not deal with a competitor, if appropriate injury to competition is proven).

⁹For a full account see HERBERT HOVENKAMP, ET AL, IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW (3d ed. 2017).

gains, whether by antitrust or some other means, reduces or even eliminates the incentive to innovate. Further, innovation typically involves fixed cost investment made up front, and that does not show up in variable costs. Nevertheless, these must be paid off if the innovation is to be profitable. As a result, pricing above short run marginal cost is an inherent feature.

Second, notwithstanding these price-cost deviations, technological progress indisputably contributes much more to economic growth than do improvements in price competition under constant technology.¹⁰ This suggests that antitrust must tread carefully before it condemns practices that are at least arguably justified by technological choice. By contrast, pure restraints on output or price deserve more aggressive treatment.

An offsetting corollary, however, is that restraints on innovation can be more harmful than simple restraints on price or quantity competition.¹¹ This places a high premium on the fact finder's ability to distinguish something that is primarily an innovation from something that is primarily a restraint on innovation.

Many restraints that seem nominally to be about distribution or price are in fact mechanisms by which firms share design and production activities. For example, tying arrangements, which are discussed below, are not simply ways of pricing finished goods. In many cases either the primary good (the "tying" product) or the secondary good (the "tied" product), or frequently both, are the consequence of innovative activity and the tie serves as a royalty substitute.¹² Other ties are ways in which firms share entrepreneurial risk or costs of development.¹³

Further, because so many innovation decisions are driven by the availability of patents or other IP rights, we must consider how antitrust policy relates to the patent system. Antitrust and patent law have their own spheres of comparative advantage. Patent law is concerned with the process of patent creation, procurement, and enforcement through infringement actions.¹⁴ To the extent these processes are mandated or authorized by the Patent Act and administered by the USPTO, Federal Circuit, and ultimately the Supreme Court, antitrust has little place. Once a patent is issued, however, the amount of supervision and authorization conferred by the Patent

¹⁰For a summary of the literature see CHRISTINA BOHANNAN AND HERBERT HOVENKAMP, CREATION WITHOUT RESTRAINT: PROMOTING LIBERTY AND RIVALRY IN INNOVATION 8-11, 238-242 (2012).

¹¹See Herbert Hovenkamp, *Restraints on Innovation*, 29 CARDOZO L. REV. 247 (2007).

¹²See discussion *infra*, text at notes __.

¹³See discussion *infra*, text at notes __.

¹⁴In contrast to enforcement by breach of contract suits for violation of license agreements. These are ordinarily governed by state law.

Act is relatively small, largely limited to a few provisions concerning licensing¹⁵ enforcement through infringement actions,¹⁶ and post-grant review.¹⁷

This paper discusses the proper boundaries of antitrust's engagement with product design or production. *First*, it considers the traditional antitrust distinction between production and distribution. That distinction has undermined effective antitrust rule making by creating an image of two successive but discrete stages. In the product design stage, the manufacturer is presumed to be in charge. In the second stage, production is assumed to be complete and a variety of distribution mechanisms come into play.

"Distribution" refers to a set of markets or hierarchies by which a firm either acquires inputs from others or moves its finished product toward the consumer. Many changes in distribution practices have resulted from the growing predominance of manufactured products over commodities. Along with this comes increased complexity and differentiation among brands. Complexity naturally increases the degree of distributor or reseller involvement; differentiation increases their dedication to a particular brand.¹⁸

As a result of these changes, intermediaries including retailers often do much more than sell. Many of these other activities resemble production more than distribution. For decades, antitrust resisted this distribution revolution by clinging to concepts such as the common law policy disfavoring restraints on alienation.¹⁹ As the Supreme Court's recent decision in *Impression Products* suggests, that relic still survives in patent policy.²⁰ Restricted distribution mechanisms are a form of restraint on alienation, but they are also welfare enhancing in most cases, including *Impression Products*.²¹

Second, central to these changes has been the bewildering range of patent and antitrust cases that fall under the general rubric of "tying." That

¹⁵35 U.S.C. §261 (authorizing licensing, including some exclusive and territorially limited licensing); 35 U.S.C. §262 (assignment and licensing under joint ownership); 35 U.S.C. §271(d) (permitting refusals to license, and also tying conditions in patent licenses in absence of market power).

¹⁶35 U.S.C. §271 (authorizing and circumscribing infringement actions); *Id.*, 281-290 (miscellany governing remedies, statute of limitations, attorneys fees, infringement actions on patents containing an invalid claim. notice)

¹⁷ 35 U.S.C. §§321-329 (authorizing and creating process for post-grant review).

¹⁸See discussion *infra*, text at notes __.

¹⁹See discussion *infra*, text at notes __.

²⁰*Impression Products, Inc. v. Lexmark Intern., Inc.*, 137 S. Ct. 1523 (2017).

²¹See Herbert Hovenkamp *Reasonable Patent Exhaustion* (Univ. Penn. Inst. For Law & Econ. Res. Paper, No. 17-29), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2995751.

term can refer to practically any situation in which two things that traditionally were available separately are bundled together. As such, they account for a large portion of the cases where antitrust has engaged technology. While tying law has historically been treated as presenting questions about contracting and distribution, it should more properly be treated as dealing with product design or entrepreneurial risk sharing. People on both sides of the tying debate have been excessively obsessed with price effects.²²

A *third* issue queries antitrust's role in policing the substance of innovation itself. Important innovations necessarily cause market dislocations, benefiting innovators and usually consumers, injuring most competitors, and affecting other entities in different ways depending on their position. Are any of these injuries ever cognizable under antitrust law, and if so when? Should the courts acknowledge a welfare "trade off" between the benefits conferred by an innovation and the harms it causes to others? For example, should antitrust have a role when an innovation is said to be minor or even trivial as a technical contribution but nevertheless causes a great deal of economic harm to other producers? If an antitrust tribunal is going to recognize that possibility at all, where should it draw the line?²³

Finally is the issue of competitor agreements that constrain independent output or pricing choices. Changes in production design often disrupt markets, sometimes when they involve new technology, but also when they involve innovations in product delivery. In most cases the effects are temporary and the market rights itself, but that does not invariably happen and often the transition period is long and costly. Further, these innovations often require collaboration among multiple competing firms. These market changes produce both losers and gainers, and losers often invoke the antitrust laws for relief. One of the most serious errors antitrust enforcement can make is to condemn practices too early, before either the innovation or the market response is adequately understood. This is particularly true of price-affecting agreements among competitors. While naked price-fixing is a restraint on distribution, many such agreements in fact reorganize production and, as such, should be treated more leniently under the antitrust laws.²⁴

One issue not treated here as a distinct category is efficiency. That might seem odd, given the centrality of efficiency concerns in any antitrust policy concerning the design of production, and new technology in particular. The explanation is that concerns about efficiency are pervasive, relevant in all of the areas described above. Further, efficiency concerns are nearly always presented as defenses. That is, antitrust does not have a policy of

²²See discussion *infra*, text at notes __.

²³See discussion *infra*, text at notes __.

²⁴See discussion *infra*, text at notes __.

pursuing practices simply because they are inefficient. They must be anticompetitive as well. In nearly every antitrust case where efficiency is relevant the dispute begins as a claim about some specific anticompetitive practice and efficiency is raised as a defense. With only a few historical exceptions, antitrust policy has avoided pursuing efficiency itself as an antitrust violation.²⁵

II. Production, Distribution, and Alienation

Both industrial organization economics and antitrust policy have traditionally distinguished “production” and “distribution.” The former is concerned with how products are designed and built. The latter begins with finished products and concerns how they are placed into the hands of consumers. Under this rubric, for example, tying law falls within the classification of “distribution restraints,” along with resale price maintenance and exclusive dealing.²⁶ This sharp distinction between product design or production on the one hand, and distribution on the other, accounts for many of the difficulties that antitrust law has had in dealing with vertical restraints. These difficulties often arise because antitrust courts mistakenly view a certain practice as part of distribution when it should have been regarded as part of design or production.

This hard distinction between production and distribution is obsolete.²⁷ It grew out of a classical economic framework that was concerned largely with commodities. Firms manufactured finished products and then sold them at wholesale to largely anonymous jobbers, factors,²⁸ distributors, or dealers who eventually passed them on to consumers. Within this framework “production” stopped at a discrete point in time and then

²⁵One exception was merger policy in the 1960s, which condemned some mergers precisely because they generated lower costs, thus injuring rivals. *E.g.*, *Brown Shoe Co. v. United States*, 370 U.S. 294 (1962). *See* Herbert Hovenkamp, *The Law of Vertical Integration and the Business Firm: 1880-1960*, 95 *IOWA L. REV.* 863, 881-883 (2010).

²⁶*E.g.*, W. KIP VISCUSI, JOSEPH E. HARRINGTON, JR., AND JOHN M. VERNON, *ECONOMICS OF REGULATION AND ANTITRUST*, Ch 8 (4th ed. 2005) (“Vertical Mergers and Vertical Restraints,” which includes exclusive dealing and tying)

²⁷I myself have followed it. *See, e.g.*, 8 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW*, Ch. 16 (4th ed. 2017) (“Vertical Distribution Restraints Limiting Intrabrand Competition”); or HERBERT HOVENKAMP, *FEDERAL ANTITRUST POLICY: THE LAW OF COMPETITION AND ITS PRACTICE*, Ch. 11 (5th ed. 2015) (“Intrabrand Restraints on Distribution”).

²⁸On the role of agricultural “factors” *see* HAROLD D. WOODMAN, *KING COTON AND HIS RETAINERS: FINANCING AND MARKETING THE COTTON CROP OF THE SOUTH, 1800-1925* (1968).

“distribution” began.

Today distribution is often so completely intertwined with production that the two are indistinguishable. Durable manufactured goods have specialized aftermarket parts or require aftermarket consumables that must be designed and delivered jointly between manufacturers and dealers. Some products are incompletely manufactured at the production point, to be assembled or finished further downstream. Many durable products require maintenance, often performed by dealers rather than manufacturers. Further, many products require an ongoing supply of specialized parts or consumable components.

A. Restraints on Alienation

One relic of the production/distribution distinction, largely abandoned in antitrust law but surviving in patent law, is the concept of restraints on alienation as a business concern. In its 1911 *Dr. Miles* decision, which created a per se rule against resale price maintenance, the Supreme Court cited the common law policy against restraints on alienation as giving dealers an antitrust right to set their own resale prices.²⁹ The concern had shown up earlier in the lower courts. In his Sixth Circuit opinion in a related case then Circuit Judge Lurton condemned resale price maintenance after concluding that the “right of alienation is one of the essential incidents of a right of general property in moveables,” and that public policy is “best subserved by great freedom of traffic in such things as pass from hand to hand.”³⁰ Subsequently the Supreme Court cited the concern with restraints on alienation in cases involving vertical nonprice restraints.³¹ Most recently the Supreme Court relied on it in refusing to enforce a tying arrangement by means of a patent infringement suit.³²

While sitting on both the Sixth Circuit and the Supreme Court, Judge Lurton also authored the two principal decisions upholding tying arrangements imposed on sold goods and enforced by patent infringement actions, never mentioning concerns with restraints on alienation. The earlier case preceded his resale price maintenance decision³³ and the later case

²⁹*Dr. Miles Medical Co. v. John D. Park & Sons Co.*, 220 U.S. 373, 404 (1911).

³⁰*John D. Park & Sons v. Hartman*, 153 F. 24, 38 (6th Cir. 1907).

³¹*United States v. Arnold, Schwinn & Co.*, 388 U.S. 365 (1967). *See also* *White Motor Co. v. United States*, 372 U.S. 253, 264-265 (1963) (Brennan, j., concurring) (citing concern with restraints on alienation); *United States v. Colgate & Co.*, 250 U.S. 300 (1919) (citing every seller’s right to deal or not as it chose).

³²*Impression Products, Inc. v. Lexmark Int’l*, 137 S. Ct. 1523, 1532 (2017).

³³*Heaton-Peninsula Button-Fastener Co. v. Eureka Specialty Co.*, 77 F. 288 (6th Cir. 1896).

followed it,³⁴ so he apparently did not change his views. Rather, Lurton believed that the law of restraints on alienation applied to price restraints such as resale price maintenance, but not to nonprice restraints such as tying. Is it possible that he recognized a difference between the two practices? While he kept his reasons to himself, he may have thought that resale price maintenance relates purely to pricing, while tying relates to product design and function.³⁵

Many of the decisions citing restraints on alienation as an antitrust or patent licensing concern relied on John Chipman Gray's influential book on *Restraints on the Alienation of Property*,³⁶ although taken completely out of context. Gray's book was concerned almost entirely with the use of alienation restraints in trusts and other instruments intended to preserve family wealth. Gray never discussed patents or other intellectual property rights in relation to alienation restraints. He also never discussed the subject of restricted commercial distribution. The concerns are fundamentally very different. As a wealth preservation device, restraints on alienation were intended to keep property within the family. By contrast, the whole point of commercial distribution is resale. A manufacturer who imposes resale price maintenance or tying is not trying to prevent a dealer from reselling the product or even requiring him to keep it for a longer time. Rather, the manufacturer wishes to control the terms or other circumstances of a resale or change the behavior of the reseller in some other way. Indeed, the reason we apply the rule of reason to such restraints today is that we believe they are likely to encourage more sales rather than fewer. To the extent a vertical practice makes sales more likely it can hardly be characterized as a restraint on alienation.

In any event, the common law of restraints on alienation was far more nuanced than the antitrust and patent restricted distribution cases acknowledged. Both English and American law permitted significant restrictions, provided that they fell short of absolute prohibitions on resale.

³⁴Henry v. A.B. Dick & Co., 224 U.S. 1 (1912).

³⁵In his dissent in *Henry*, Chief Justice White (joined by Justices Hughes and Lamar) located the difference in the fact that *Dr. Miles* applied to contracts generally, while *Henry* applied to patent law. White made clear that he believed that this distinction was improper because of its ability to run roughshod over state law. See *Henry*, 224 U.S. at 54-55 (White, C.J., dissenting). He later found an absolute inconsistency between the two decisions. *Id.* at 71. Justice Holmes was a silent member of the *Henry* majority. He had also dissented in *Dr. Miles*. He would have supported enforcement of the agreements in both cases.

³⁶JOHN CHIPMAN GRAY, RESTRAINTS ON THE ALIENATION OF PROPERTY §§27-28(1895). See *Dr. Miles Medical Co. v. John D. Park & Sons Co.*, 220 U.S. 373, 405 (1911) (citing Gray).

For example, the common law permitted many restraints that were of limited duration.³⁷ The mid-nineteenth century British decision in *Tulk v. Moxhay* permitted equitable enforcement of land use restrictions,³⁸ and so-called covenants running with the land were widely enforced even during the era of *Dr. Miles*.³⁹ In the 1920s even covenants that restricted the sale of property to specific races were enforced by state courts and approved for a time by the Supreme Court.⁴⁰ The *Dr. Miles* opinion did not say whether it was drawing its rationale from the established common law of restraints on alienation or developing a new antitrust rule just for antitrust cases.⁴¹ Writing in dissent, Justice Holmes could find no precedent for it, and concluded that the majority was “extending a certain conception of public policy to a new sphere.”⁴² The closest analogy he could find was combinations to exclude, but he found no exclusion in this case.⁴³ On the common law, Holmes was correct. Although the cases were divided, most approved of RPM.⁴⁴ While on the Supreme Judicial Court of Massachusetts two years prior to his appointment to the United States Supreme Court, Holmes himself had authored an opinion enforcing an RPM agreement.⁴⁵

³⁷Hovenkamp, *Reasonable Patent Exhaustion*, *supra* note ____.

³⁸*Tulk v. Moxhay*, 2 Ph. 774, 41 ER 1143 (1848).

³⁹*E.g.*, *Korn v. Campbell*, 192 N.Y. 490 (1908) (covenant to build only single family home); *Bronson v. Coffin*, 108 Mass. 175 (1871) (covenant to maintain a fence).

⁴⁰*Corrigan v. Buckley*, 271 U.S. 323 (1926) (racially restrictive covenant was purely private action and did not invoke a federal question). *See also* *Koehler v. Rowland*, 275 Mo. 573 (1918) (upholding racially restrictive covenant); *Parmalee v. Morris*, 218 Mich. 625 (1922) (same); *Los Angeles Inv. Co. v. Gary*, 181 Cal. 680 (1919) (same, rejecting Equal Protection argument because the Clause applied only to government action). Such restrictions were eventually declared unenforceable under the Equal Protection Clause by *Shelley v. Kraemer*, 334 U.S. 1 (1948) (overruling *Corrigan v. Buckley*).

⁴¹*Dr. Miles Medical Co. v. John D. Park & Sons Co.*, 220 U.S. 373, 404 (1911).

⁴²*Id.* at 411 (“there is no body of precedent that, by ineluctable logic, requires the conclusion to which the court has come”).

⁴³*Id.* at 412.

⁴⁴*See* *Ft. Smith Light & Traction Co. v. Kelley*, 94 Ark. 461 (1910) (upholding RPM contract at common law); *Grogan v. Chaffee*, 156 Cal. 611 (1909) (same; common law); *Commonwealth v. Grinstead*, 111 Ky. 203 (1901) (RPM not unlawful under state antitrust statute); *Garst v. Charles*, 187 Mass. 144 (1905) (enforcing RPM contract at common law); *W.M. Clark v. Frank*, 17 Mo. App. 602 (1885) (upholding RPM but citing fact that the contract at issue did not dominate the entire market). The courts were not unanimous, however. *See* *W.H. Hill Co. v. Gray & Worcester*, 163 Mich. 12 (1910) (RPM contracts covering a large portion of the industry void as in restraint of trade).

⁴⁵*Garst v. Harris*, 177 Mass. 72 (1900).

Gray wrote his important treatise on *Restraints on Alienation* just as manufacturers were expanding the use of controlled distribution networks that increased the number of commercial distribution restraints.⁴⁶ Under the evolving law resellers were regarded much less as anonymous agents who purchased a product and sold it on their own terms, and more as arms of the manufacturer, improving the consumer experience with a product and transmitting its goodwill.⁴⁷

Antitrust courts found restricted distribution difficult to assess. Resale price maintenance remained per se illegal for about a century, although it became subject to many qualifications that limited its reach.⁴⁸ For nonprice restraints, exclusive dealing and tying the courts meandered from tolerance in the 1920s, to hostility from the 1930s through the 1970s, and then back to greater tolerance. For example, in 1921 the Second Circuit wrote a defense of restricted distribution in gasoline that could as easily have been written today. In rejecting an FTC campaign to require gasoline refiners to permit “split pump” stations,⁴⁹ it wrote:

Every pumping station is an advertisement; each bears the name of the oil producer whose gasoline is supplied therefrom, if the retailer honestly observes his bargain. The system is a great convenience to the public; it has increased enormously the ease with which motor drivers may obtain ‘gas’ even in remote and thinly settled districts. It is the only method known or suggested, of keeping before the consuming public the oil manufacturers’ trade-mark.

⁴⁶See HERBERT HOVENKAMP, *THE OPENING OF AMERICAN LAW: NEOCLASSICAL LEGAL THOUGHT, 1870-1970* at 124-129 (2015).

⁴⁷*E.g.*, *United States v. Colgate & Co.*, 250 U.S. 300 (1919) (resale price maintenance in toothpaste and other toiletries); *United States v. A. Schrader’s Son, Inc.*, 252 U.S. 85 (1920) (automobile parts); *Straus v. Victor Talking Machine Co.*, 243 U.S. 490 (1917) (phonographs and related supplies); *FTC v. Beech-Nut Packing co.*, 257 U.S. 441 (1922) (food products); *Sinclair Refining Co. v. FTC*, 276 F. 686 (7th Cir. 1921), *aff’d* 261 U.S. 463 (1923) (use of agency system by full service gasoline stations); *Frey & Son v. Cudahy Packing Co.*, 256 U.S. 208 (1921) (restricted distribution of cleansers).

⁴⁸See 8 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶¶1620-1627 (4th ed. 2017). The per se rule was finally rejected in *Leegin Creative Leather Prods., Inc. v. PSKS, Inc.*, 551 U.S. 877 (2007).

⁴⁹That is, stations that simultaneously sold multiple brands of gasoline. See DON E. WALDMAN & ELIZABETH J. JENSEN, *INDUSTRIAL ORGANIZATION: THEORY AND PRACTICE* 610 (4th ed. 2013). In 1923 the Supreme Court also accepted the argument that refiners needed to prohibit split-pump stations in order to prevent dealers from mixing higher and lower quality gasoline. See *FTC v. Sinclair Refining Co.*, 261 U.S. 463 (1923). It changed its position in the *Standard Stations* decision, discussed *infra* note ____.

... The majority of small dealers have small capital, and therefore lease rather than buy. It is perfectly possible to buy from the same manufacturers who supply to the oil dealers the pumps leased by the latter. The competition between the various oil-selling persons and corporations is and has been very keen; each is desirous of extending the sale of his own brand, and the system of leased pumps, each bearing the trade-mark or trade-name of its lessor, is regarded by many, though not all, wholesalers as a profitable form of advertisement.⁵⁰

By the late 1970s the Supreme Court concluded in *Sylvania*, which overruled the per se rule against vertical nonprice restraints, that most writers regarded the Supreme Court's use of restraint-on-alienation rationales in cases involving vertical restraints as "both a misreading of legal history and a perversion of antitrust analysis."⁵¹

B. Production, Distribution, and the Firm

The economic theory of the firm has also come to regard the traditional distinction between production and distribution as meaningless. Ronald Coase's insight in *The Nature of the Firm* was that the size and shape of a firm are determined by a series of decisions in which managers compare the costs and benefits of internal vs. external provision. If the manager of an automobile maker predicts a better payoff from self-production of windshield wiper blades, it will produce them. By contrast, if independent manufacturers of blades provide advantages sufficient to offset the costs of using the market, the automaker will purchase them. The same thing is true of the decision whether to engage in self-distribution to the retail level or to use independent, franchised car dealers. Whether the decision concerns "production" (making one's own wiper blades) or "distribution" (selling cars through wholly owned or franchised dealers) is not a matter of importance.

Rules limiting restraints on alienation interfere with efficient firm structure by providing differential treatment depending on whether a firm engages in self distribution or distributes by contract. For example, the manufacturer that owns its own retail stores is free to set the price because no one's right to alienate is being restrained. By contrast, as soon as that manufacturer deals with an independent retailer the concern emerges.

Looking ex ante, the firm engaged in make or buy decisions and operating under a restraint on alienation rule will inefficiently choose "make" when "buy" would be preferable. For example, in a neutral legal environment a firm would compare the cost of retailing its own gasoline with the cost of using independent dealers and choose the one with the largest payoff. That

⁵⁰Standard Oil Co. of New York v. FTC, 273 F. 478, 480 (2d Cir. 1921).

⁵¹Continental T.V., Inc. v. GTE Sylvania, Inc., 433 U.S. 36, 53 n. 21 (1977).

could well be independent dealers because they enable the firm to share downstream risk, and owner-dealers may have incentives that employees lack. But suppose the law forbids the firm from restricting the dealers to its own brand of gasoline, as the Supreme Court did in the *Standard Stations* case,⁵² effectively overruling the Second Circuit's decision quoted above.⁵³ The *Standard Stations* decision, which required refiners to permit split-pump stations, effectively eliminated the independent franchised dealer as a branded agent for its supplier, significantly undermining the ability of refiners to develop branded distribution networks. It basically treated gasoline as a commodity, which the dealer was entitled to buy and resell without refiner control. Although Justice Douglas very likely had never read Coase, his *Standard Stations* dissent was prescient:

The elimination of these requirements contracts sets the stage for Standard and the other oil companies to build service-station empires of their own. The opinion of the Court does more than set the stage for that development. It is an advisory opinion as well, stating to the oil companies how they can with impunity build their empires. The formula suggested by the Court is either the use of the 'agency' device,⁵⁴ which in practical effect means control of filling stations by the oil companies, or the outright acquisition of them by subsidiary corporations or otherwise.⁵⁵

Justice Douglas realized that the mandatory toleration of split pumps completely changed the calculus of a firm weighing the costs and benefits of alternative distribution modes. By raising the cost of contractual distribution, the Court was effectively forcing the firm to engage in ownership distribution.

The antitrust analysis of vertical restraints remained on the wrong track until courts began to realize that dealers and other intermediaries often perform important production functions, requiring significant supplier oversight. The optimal amount of dealer involvement in production varies with the extent of product differentiation and complexity, the extent of

⁵²Standard Oil Co. of California and Standard Stations, Inc. v. United States, 337 U.S. 293 (1949) (condemning exclusive dealing by nondominant refiner).

⁵³Standard Oil Co. of New York v. FTC, 273 F. 478, 480 (2d Cir. 1921). See discussion *supra*, text at notes ___.

⁵⁴A mechanism by which the stations would not purchase the gasoline at all but rather sell it on commission. See *FTC v. Cutis Pub. Co.*, 260 U.S. 568 (1923) (distinguishing sale-plus-resale from sale on commission, and holding that § 3 of the Clayton Act applies only to the former). Cf. *Simpson v. Union Oil Co.*, 377 U.S. 13 (1964) (refusing to apply "agency" designation to firm that purported to give its gasoline on consignment to dealers in order to avoid resale price maintenance rule).

⁵⁵*Standard Stations*, 337 U.S. at 320.

customer familiarity, the amount of aftermarket service that is required, the nature and specificity of aftermarket parts, and the amount and nature of risk that dealers assume. Further, these needs vary with the product. Early on when products are new and consumers poorly informed about them, relatively greater supplier involvement will be required. Later on, however, when customers have become better educated the role of distributors and dealers will become more commoditized.⁵⁶

C. Choice of a Distribution Mode: Legal Consequences

The set of practices that we traditionally describe as distribution can take place either within the firm, as when a manufacturer owns its own retail stores, or outside it when it uses contracts with others. These are alternative forms of organization that presumptively have no consequences for competition. A firm selects one or the other depending on the payoff, and some firms use a mixture.⁵⁷

The antitrust statutes unfortunately distinguish unilateral from multilateral conduct, and have been interpreted to apply a harsher standard to the latter. A firm acting through wholly owned stores is engaged in unilateral conduct which is reachable, if at all, under §2 of the Sherman Act as unlawful monopolization or attempt. Both the power and conduct requirements are relatively strict, and §2 is concerned only with practices that exclude or threaten exclusion.

By contrast, a firm whose relationship with its retailers is contractual is a party to an agreement and is thus subject to §1 of the Sherman Act, which reaches contracts, combinations, and conspiracies in restraint of trade. It can also be subject to §3 of the Clayton Act, which reaches tying and exclusive dealing only when there is an anticompetitive “condition or understanding,” which is also an agreement. Further, these practices are subject to a “restraint of trade” standard, which means that they can reach practices that reduce output and raise prices even if they are not exclusionary.

The Robinson-Patman Act,⁵⁸ which was passed in 1936 at the high point of hostility toward controlled distribution, adopts the same limiting approach.

⁵⁶*E.g.*, *United States v. Jerrold Electronics Corp.*, 187 F. Supp. 545 (E.D.Pa. 1960) (early in product lifecycle bundled provision of all elements was necessary to make product work properly, but not after product had become well understood by consumers).

⁵⁷For example, in “dual distribution” systems a manufacturer distributes part of its output through wholly owned subsidiaries and another part through independent franchisees. *See* 8 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶1605 (4th ed. 2017).

⁵⁸15 U.S.C. §13.

Because the statute applies its price discrimination prohibition only to low and high price “sales,” it reaches networks in which a manufacturer operates through independently owned dealers, but not networks of wholly owned dealers. In the latter there is no qualifying “sale” between the manufacturer and the dealer.⁵⁹

This bit of statutory formalism has misguided antitrust since its inception, providing for more aggressive treatment against firms that integrate vertically by contract than those who do so by ownership. To be sure, in some situations the existence of separate entities plus an agreement is relevant. For example, powerful dealers or cartels of dealers can profit from activities that restrict output, counter to the wishes of the supplier.⁶⁰ That would not happen if the supplier owned its dealers.

D. Vertical Agreements, Intra-brand and Inter-brand

The problem of powerful dealers, dealer cartels, or related deviations from ordinary output maximizing conduct is generally restricted to “intra-brand” restraints, which include resale price maintenance and vertical spatial separation, or nonprice restraints. Intra-brand restraints can reflect both dealer involvement in production or anticompetitive price-fixing, depending on the circumstances. To illustrate, Lester Telser’s well-known article about fair trade argued that at least some instances of resale price maintenance were designed to induce more optimal dealer involvement through provision of services that were best provided at the point of sale.⁶¹ Setup, display, consumer education and follow through were all parts of the production process that the manufacturer could not easily supervise from afar. Resale price maintenance plus interdealer competition became a way to get retailers to do it. Telser’s free rider explanation explains only a subset of the instances of RPM, however. Other instances result from dealer collusion or the activities of powerful dealers who want to protect their own high margins.⁶² So the real antitrust question in RPM cases under the rule of reason is whether a particular instance of RPM is really a part of production, or is it a simply price restraint?

By contrast, “inter-brand” restraints, which include tying and exclusive

⁵⁹*Security Tire & Rubber Co. v. Gates Rubber Co.*, 598 F.2d 962, 966 (5th Cir.), cert. denied, 444 U.S. 942 (1979) (transfer between parent and wholly owned subsidiary not a “sale” for Robinson-Patman purposes). See 14 HERBERT HOVENKAMP, *ANTITRUST LAW* ¶¶2311, 2312 (3d ed. 2013).

⁶⁰*Id.*, ¶1604.

⁶¹Lester G. Telser, *Why Should Manufacturers Want Fair Trade?*, 3 J. L. & ECON. 86 (1960).

⁶²See 8 AREEDA & HOVENKAMP, *supra* note __, ¶1604.

dealing, are rarely favored by dealers. A dealer might wish that *other* dealers be bound by exclusive dealing or tying requirements, but would not commonly seek them for itself. It would rather make its own choice about whether to deal in the supplier's product exclusively. To that extent, exclusive dealing and tying are unlikely to be explained by dealer power and can be regarded as having about the same effects as vertical ownership.

The important differences between exclusive dealing or tying on one side and vertical ownership on the other are largely legal rather than economic. For example, if Lexmark owned its own retail stores, the refusal of those stores to carry Canon printers would be treated under antitrust law as a unilateral refusal to deal, which means more-or-less automatic legality.⁶³ By contrast, if Lexmark sells to an independent retailer and imposes the same requirement it would be exclusive dealing. The same thing is true of tying. For example, fast food franchisor Chicken Delight's insistence that wholly owned restaurants use its own napkins and spoons would be unilateral self-dealing. The same requirement imposed on independently owned franchisees was held to be unlawful tying.⁶⁴

Contrary to the existing statutory structure, tying and exclusive dealing in distribution arrangements should generally be treated as "unilateral" practices, even though they are imposed by agreement. They do not represent the incremental opportunity to exercise power that we ordinarily associate with the move from unilateral to bilateral conduct. As a result, the market power requirements for tying and exclusive dealing should presumptively be the same as for single firm monopolization.⁶⁵ Further, they should not be condemned unless they are exclusionary, and not simply because they extract more from customers.⁶⁶

Manufacturer decisions to employ exclusive dealing or tying generally fall into two categories. When exclusive dealing is imposed on dealers in branded goods, its purpose is generally to get dealers to behave in the way a wholly owned subsidiary would behave – that is, it operates as an alternative to ownership vertical integration. For example, Baskin-Robbins imposes exclusive dealing on franchisees because it wants them to be stores specializing in the sale of Baskin-Robbins ice cream.⁶⁷ That decision is no

⁶³See *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398 (2004) (refusing to condemn unilateral refusal to deal by a monopolist).

⁶⁴*Siegel v. Chicken Delight, Inc.*, 448 F.2d 43 (9th Cir. 1971).

⁶⁵See Herbert Hovenkamp, *The Rule of Reason*, __ FLA. L. REV. __ (2018) (in press).

⁶⁶See discussion *infra*, text at notes __.

⁶⁷See *Krehl v. Baskin-Robbins Ice Cream Co.*, 1979 WL 1662 (C.D. Cal. Aug. 7, 1979), *aff'd*, 664 F.2d 1348 (9th Cir. 1982) (refusing to condemn franchisor's

more exclusionary than Baskin-Robbins decision to sell ice cream through wholly owned stores.

Exclusive dealing is more likely to be anticompetitive when it is used by dominant firms in a way that effectively requires end users to purchase exclusively or substantially from the firm in question.⁶⁸ Significantly, Baskin-Robbins' decision to use exclusive dealing in order to achieve single branding can be profitable even if its market share is very small. By contrast, using exclusive dealing to achieve anticompetitive exclusion requires a dominant market share. As a result, significant market power is a necessary, but not a sufficient, condition for competitive harm.

Tying, discussed more fully below, can be used for the same purposes as exclusive dealing. More than any of the vertical restraints, however, tying is closely bound up with production. The particular configuration or design of a product or service is likely to be the dominant factor in the decision to tie. For example, if one thinks of a good such as a laser printer as "finished," then a manufacturer's requirement tying its aftermarket toner cartridges sounds like a restraint on distribution.⁶⁹ By contrast, if the market is for printing services in which the printer and its cartridges are vital components, then the tie is more a part of production. The cartridge must be designed to work in a particular manufacturer's printer. The printer maker may be expected to provide warranty services if the combination fails to deliver as promised. The home or office printer plus separately purchased cartridges competes with commercial printing services. In the latter the consumer is largely uninformed and very likely indifferent about how and from where the printer and the cartridge were acquired. If both the printer and the cartridge are protected by patents, then patent law may limit the ability of customers to substitute away from the manufacturer's printer/cartridge combination. Finally, products are sometimes designed in such a way that two components will not work unless they are used together. That was true of Kodak's famous Instamatic camera plus film cartridge in the *Berkey Photo* case.⁷⁰ It was also the case for Microsoft's "commingling" of the software code for its Windows computing operating system and its Internet Explorer web browser.⁷¹

requirement, brought as both tying and exclusive dealing, that franchisee's deal exclusively in franchisor's ice cream).

⁶⁸*E.g.*, *McWane, Inc. v. F.T.C.*, 783 F.3d 814 (11th Cir. 2015); *United States v. Dentsply Intern., Inc.*, 399 F.3d 181 (3d Cir. 2005).

⁶⁹As in *Impression Products, Inc. v. Lexmark Intern., Inc.*, 137 S. Ct. 1523 (2017).

⁷⁰*Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263 (2d Cir. 1979). See discussion *infra*, text at notes __.

⁷¹*United States v. Microsoft Corp.*, 253 F.3d 34, 64-65 (D.C.Cir. 2001) (Microsoft's commingling of operating system and internet browser code violated

As the next section elaborates, many tying arrangements result from design choices. One manifestation of this is the fifty year history of “tying” cases in patent law before there were any antitrust laws.

III. Technology and Tying

“Tying” occurs when someone combines two products that had previously been regarded as separate and refuses to sell them individually. Anyone who looks at the history of tying is struck by its close linkage with design – more particularly, with invention, patenting, and technology. The reason is intuitively easy to explain. New technologies change product boundaries. This process involves both disaggregation of what previously had been made or sold together, and aggregation of what previously had been separate. As an example of disaggregation, what a fireplace might have accomplished in the early nineteenth century would later be performed by a furnace, a kitchen stove, and a toaster. Or a farmer that used hand tools to grow a variety of crops would later use specialized equipment and concentrate on one or two crops. Innovation-induced disaggregation occurs less frequently than aggregation. Further it is much less likely to cause the dislocations, or destruction of previous investment, that has accompanied aggregation. For example, if GE makes furnaces, kitchen stoves, and toasters it would be quite happy to sell you one of each. As a result, you can still replace all the functions of your fireplace from the same seller.

Innovation-induced aggregation is another matter, and it sometimes wipes out entire industries. For example, the deployment of the automobile severely damaged the formerly separate markets for horses and wagons or buggies, so say nothing of buggy whips and blacksmiths. The development of the personal computer, largely attributed to IBM, virtually ruined an industry of businesses that had made free standing computer components that customers could acquire separately and combine for themselves.⁷² Innovation-induced tying is often coercive, in the sense that sellers of the new product are unable or unwilling to sell things separately. In an earlier day horses and buggies were customarily sold separately. Today automobile manufacturers bundle automobiles with their engines. The same is true of computers and disc drives. This is why we have a significant law of tying, but not of untying.⁷³

§2 of Sherman Act).

⁷²See FRANKLIN FISHER, JOHN J. MCGOWAN AND JOEN E. GREENWOOD, FOLDED, SPINDLED, AND MUTILATED: ECONOMIC ANALYSIS OF U.S. v. IBM (1983).

⁷³For example, the *Antitrust Law* treatise’s treatment of tying law runs to over 1000 pages. 9 & 10 PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST

Several phenomena account for the link between tying and technology. These include 1) product complexity; 2) manufacturing and functional economies, particularly economies of scope⁷⁴; 3) product differentiation; 4) dedicated aftermarkets; 5) attempts to maximize the value of intellectual property rights, including metering or price discrimination; 6) economies of distribution; 7) joint risk taking or entrepreneurship; and 8) exclusion, or attempts to protect one's own market from competitors' entry or growth.

Most of these rationales suggest procompetitive, welfare-increasing results, and none is inherently anticompetitive. The most likely candidate for competitive harm is number (8), or attempts to protect oneself from competition. Such attempts can be anticompetitive under the right structural conditions, but they are not always so. Number (5), capitalizing on IP rights, has been regarded as anticompetitive,⁷⁵ but making that case is difficult unless the conduct is also exclusionary.⁷⁶

A. Tying in Patent Law

The history of tying law illustrates its close connection with technology, design, and innovation. Although it was not called by that name, tying was well developed as a part of patent law long before there were any antitrust laws. In the nineteenth century tying or analogous practices raised issues under several patent law doctrines, including the "repair/reconstruction" distinction, the appropriate scope of so-called "combination patents," contributory infringement, and patent exhaustion. A little later came the judge made patent law doctrine of "misuse," and antitrust law only after that. By the time ties were first addressed under the antitrust laws dozens of decisions had considered them under patent law.

This early patent law of tying did not expressly address issues of competition policy but focused instead on the proper scope of a patent, particularly where a patented device contained multiple parts with different lifecycles, or contemplated the use of unpatented complementary goods. Suppose a patented phonograph device used unpatented wax discs to make sound recordings. To what extent should we consider the disc to be a part of the device? More to the point, should we permit the patentee seller to insist

LAW, Ch. 17 (4th ed. 2018) (in press).

⁷⁴Economies of scope are cost savings that accrue because doing two or more things together is cheaper than doing each one separately.

⁷⁵*E.g.*, *International Salt Co. v. United States*, 332 U.S. 392 (1947) (antitrust); *Carbice Corp. of Am. v. Am. Patents Dev. Corp.*, 283 U.S. 27, 33 (1931) (patent misuse).

⁷⁶On nonexcluding ties, *see* 9 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶¶1722-1725 (4th ed. 2018) (forthcoming).

that purchasers cannot use discs from a different provider without committing patent infringement? Decisions like this were common in the nineteenth century long before the antitrust laws were passed.

The earliest patent cases that included tying-like issues concerned patent law's distinction between "repair" and "reconstruction." Under patent law the purchaser of a patented good is entitled to repair it, but "reconstructing" it is a form of duplication constituting patent infringement.⁷⁷ Already in 1850 the Supreme Court held that the purchaser of a wood planing machine was free to replace the machine's worn out cutter knives with knives that he had either made for himself or procured from someone other than the patentee. As the Supreme Court observed, the machine's cutter knives wore out at "short intervals," rendering the machine unusable until they were replaced. Further, this was an inherent part of the "arrangement," or design, of the machine.⁷⁸ Justice Holmes made a similar observation dispositive, concluding that when a durable copy machine used gelatin bands that wore out after a few uses, the purchaser of the machine had a right to obtain replacement bands from any source.⁷⁹ In its last considered treatment of the issue in 1961, the Supreme Court held that replacement of the worn out fabric of a patented convertible automobile top was a permissible "repair" rather than an infringing "reconstruction."⁸⁰

What if the short lifecycle portion of an invention is something that is

⁷⁷For recent examples, *see* *Fuji Photo Film co., Ltd. v. ITC*, 474 F.3d 1281 (Fed. Cir. 2007) (refurbishing of camera intended to be disposable by replacing the back cover was a permissible repair, not a reconstruction); *Surfco Hawaii v. Fin Control Sys., Pty, Ltd.*, 264 F.3d 1062 (Fed. Cir. 2001) (replacing fins on a surfboard was a repair, not an infringing reconstruction of the board).

⁷⁸*Wilson v. Simpson*, 50 U.S. 109, 125-126 (1850):

The right of the assignee to replace the cutter-knives is not because they are of perishable materials, but because the inventor of the machine has so arranged them as a part of its combination, that the machine could not be continued in use without a succession of knives at short intervals. Unless they were replaced, the invention would have been but of little use to the inventor or to others.

See also *Thomson-Houston Elec. Co. v. Kelsey Elec. Rwy. Specialty Co*, 75 F. 1005 (2d Cir. 1896) (one who purchases a combination patent covering a set of connection devices enabling the transmission of power from its source to a moving train, is free to replace a worn out part from a source other than the patentee). *See* *Shickle, Harrison & Howard Iron Co. v. St. Louis Car-Coupler Co.*, 77 F. 739 (8th Cir. 1896) (purchaser of a patented device "consisting of several distinct parts" has a right to repair it by replacing a worn out part, provided that this part is not separately patented).

⁷⁹*Heyer v. Duplicator Mfg. Co.*, 263 U.S. 100 (1923).

⁸⁰*Aro Mfg. Co. v. Convertible Top Replacement co.*, 365 U.S. 336 (1961).

used only once? In that situation, the Supreme Court observed in *Morgan Envelope*, “the distinction between repair and reconstruction becomes of no value.”⁸¹ That patentee produced a toilet paper dispenser sold in combination with unpatented rolls of toilet paper. Replacing the spent toilet paper was neither a repair nor a reconstruction, as the Court observed. It applied the patent exhaustion rule, holding that once the dispenser had been sold the purchaser took that unit free and clear of any obligation under the patent.

The patent exhaustion cases also date back to the 1850s.⁸² This judge made doctrine, which today is as robust as ever,⁸³ held that once the patentee had sold a patented good it had exhausted its rights in that patent and could not subsequently enforce license restrictions by a patent infringement suit. The exhaustion rule has been applied to a variety of post-sale restraints, but beginning in the late nineteenth century many of the cases involved tying – most generally when a durable patented invention required the use of some single use or consumable complement which the seller insisted be purchased only from itself.⁸⁴

⁸¹*Morgan Envelope Co. v. Albany Perforated Wrapping Paper Co.*, 152 U.S. 425, 433 (1894).

⁸²Originating in *Bloomer v. McQuewan*, 55 U.S. (14 How.) 539 (1852). For different opinions about the doctrine’s origins and rationale, see John F. Duffy & Richard Hynes, *Statutory Domain and the Commercial Law of Intellectual Property*, 102 VA. L. REV. 1 (2016); Herbert Hovenkamp, *Patent Exhaustion and Federalism: A Historical Note*, 100 VA. L. REV. ONLINE 25 (2016).

⁸³See *Impression Products, Inc. v. Lexmark Intern., Inc.*, 137 S. Ct. 1523 (2017); Hovenkamp, *Reasonable Patent Exhaustion*, *supra* note ____.

⁸⁴Important early examples of patent ties raising exhaustion issues include *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 516 (1917) (patent exhaustion precluded enforcement of license condition requiring purchaser of projector to show the patentee’s films); *Henry v. A.B. Dick & Co.*, 224 U.S. 1 (1912) (tie of patented mimeograph machine to paper, stencils and ink); *Morgan Envelope Co. v. Albany Perforated Wrapping Paper Co.*, 152 U.S. 425 (1894) (patented toilet paper dispenser tied to unpatented toilet paper); *Wagner Typewriter Co. v. F.S. Webster Co.*, 144 F. 405 (C.C.S.D.N.Y. 1906) (patented typewriter and typewriter ribbons); *Heaton-Penninsular Button Fastener Co. v. Eureka Specialty Co.*, 77 F. 288 (6th Cir. 1896) (patented button fastening machine and staples used for fastening; refusing to find exhaustion); *Crown Cork & Seal Co. of Baltimore v. Brooklyn Bottle Stopper Co.*, 172 F. 225 (E.D.N.Y. 1909) (patented bottle corking machine and tied corks; refusing to find exhaustion); *A.B. Dick Co. v. Milwaukee Office Specialty Co.*, 168 F. 930 (C.C.E.D.Wis. 1908) (mimeograph machines and stencils; refusing to find exhaustion); *Aeolian Co. v. Harry H. Juelg Co.*, 155 F. 119 (2d Cir. 1907) (patented player piano and music rolls; no exhaustion); *Brodrick Copygraph Co. v. Roper*, 124 F. 1019 (D.R.I. 1903) (copying machine and ink; no exhaustion, but observing that the ink was capable of noninfringing uses and limiting the injunction to sale of ink actually known by the seller to be intended for

One important difference between the repair-reconstruction distinction and patent exhaustion is that exhaustion applied to a license condition stated at the time the patented good was sold. By contrast, the repair/reconstruction distinction could apply to a patented article whether or not any condition was attached. That was true of the combination patent as well.

Patent law's contributory infringement rule applied when the patent contemplates that a product and a process are to be used together, even if the product is unpatented, and the defendant sells the unpatented product knowing that its intended use will be in combination with the process. Thus the patent itself imposes tying to the extent it prohibits anyone except the patentee from selling the product separately. In *Leitch*, a New Deal era case, the Court refused to find infringement by a seller of an unpatented road building material that could be applied only with the patented process. The Court found an attempt to extend enforcement "beyond the scope" of the patent by interpreting it to cover the unpatented material.⁸⁵ In 1952 Congress amended the Patent Act, making clear that a sale of the unpatented good would infringe if it was not capable of substantial noninfringing uses.⁸⁶

By contrast, a combination patent was ordinarily given to a combination of separate devices, some or all of which might be separately patented. As the Supreme Court defined the term in *Victor Talking Machines*,

A combination is a composition of elements, some of which may be old and others new, or all old or all new. It is, however, the combination that is the invention, and is as much a unit in contemplation of law as a single or noncomposite instrument.⁸⁷

That decision held that that Victor, which owned a combination patent on a phonograph together with unpatented wax discs on which music was recorded, had a patent right to insist that a purchaser of the machine use only discs provided by the patentee itself. As Justice McKenna observed, it was

infringement of the patent); *Cortelyou v. Lowe*, 111 F. 1005 (2d Cir. 1901) (per curiam) (patented copying machine and unpatented supplies; no exhaustion where contributory infringement defendant apparently did not know he was selling good for an infringing use).

⁸⁵*Leitch Mfg. Co. v. Barber Co.*, 302 U.S. 458, 462 (1936) ("beyond the scope of the patentee's monopoly").

⁸⁶35 U.S.C. §271(c). See *Dawson Chemical Co. v. Rohm and Haas Co.*, 448 U.S. 176 (1980) (interpreting new provision: sale of unpatented chemical that could be applied only by patentee's method patent constituted contributory infringement).

⁸⁷*Leeds & Catlin Co. v. Victor Talking Machine Co.*, 213 U.S. 325, 333 (1909), *overruled by* *Mercoird Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661 (1944). The Supreme Court's decision in *KSR v. Teleflex*, 550 U.S. 398 (2007) made it much more difficult for the creator of a combination patent to show that the new combination of previously known technologies met the nonobviousness requirement.

the interaction of the stylus in the machine and the impressions in the disc that produced the desired sound. In this case the infringement defendant “had made and sold a single element of the claims of the ... patent, with the intent that it should be united to the other element and complete the combination; and this is infringement...”⁸⁸

The *Victor* rule effectively authorized the owner of a combination patent to impose tying to the extent that the tying and tied products were the separate components of a combination patent. Thirty-five years later in *Mercoid*, however, the Court changed its mind, holding that if an element in a combination patent was itself unpatented the user had a right to supply that good for itself. To hold otherwise would expand the patent’s coverage beyond its lawful scope to include unpatented articles.⁸⁹ In a separate decision issued the same day the Court held that the patentee’s insistence that a buyer take all elements of the combination together from the patentee, including the unpatented element, was unlawful tying under the antitrust laws.⁹⁰

Some decisions employed these doctrines in combination. For example, in *Aiken* the court held that the purchaser of a knitting machine that used needles that wore out frequently was free to replace the worn out needles with needles that he had produced himself.⁹¹ First, this replacement constituted a “repair” of the machine. Second, under the patent exhaustion rule the sale of the knitting machine exhausted the patents contained in that machine and could no longer control the purchaser’s conduct.

These patent tying cases rarely mention competition policy as such. Their concern is how to determine the appropriate scope of the patent in order to measure the patentee’s reward. As such they were very heavily driven by technological and design issues pertaining to the life expectancy, separate patentability, or functionality of the individual components that made a

⁸⁸*Leeds & Catlin*, 213 U.S. at 332. *See also* Thomson-Houston Elect. Co. v. Ohio Brass co., 80 F. 712 (6th Cir. 1897) (combination patent covering components of railroad switch; enjoining defendant from selling one of the unpatented components). Courts had reached this conclusion as early as 1878. *Bowker v. Dows*, 3 F.Cas. 1080 (C.C.D.Mass. 1878). The combination patent in question required a presumably unpatented extract taken from unspecified vegetables; the defendant sold the extract, advertising its use in infringement of the patent; the court approved an injunction.

⁸⁹*Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661, 667 (1944).

⁹⁰*Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 680, 684 (1944) (“The legality of any attempt to bring unpatented goods within the protection of the patent is measured by the anti-trust laws not by the patent law.”).

⁹¹*Aiken v. Manchester Printer Works*, 2 Cliff. 435, 1 F. Cas. 245, # 113 (D.N.H. 1865).

patented article valuable.

B. Tying and Antitrust Law

The emergent theory of patent ties, widely embraced during the Progressive Era, was that the patentee was trying to expand its power from the patented primary product, where patent law rightfully gave it a monopoly, to include a second unpatented product in which it had no legal monopoly.⁹²

The early antitrust analysis of ties developed in controversy surrounding the Supreme Court's *Henry* decision.⁹³ Writing for the majority, Justice Lurton had taken a benign position on patent ties, originally formulated in the *Button* case while he was still a judge on the Sixth Circuit Court of Appeals.⁹⁴ In that case, the patentee's machine used small metal staples to fasten buttons to newly made garments. The staples were loaded into the machine and were used a single time. By a license restriction created on sale of the machine, the patentee required the staples to be purchased from the patentee. In upholding this restriction Lurton rejected the argument that the machine-staple tie constituted an improper enlargement of the monopoly from the machine to the unpatented staples. Rather, any monopoly that resulted from the tie was entirely derivative of the monopoly that resulted from the patent itself.⁹⁵ He concluded, the tie was not a producer of monopoly at all but rather a metering device "by which the royalty proportioned to the actual use of the

⁹²*E.g.*, *Motion Pictures Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 517 (1917) (tying of patented projector to unpatented films was attempt to extend power "wholly without the scope of the patent monopoly."); *Carbice Corp. of Am. v. Am. Patents Dev. Corp.*, 283 U.S. 27, 33 (1931) (tying of patented ice box to unpatentable dry ice: "Control over the supply of such unpatented material is beyond the scope of the patentee's monopoly"); *Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661, 665-66 (1944) (tying of unpatented elements in combination patent was an attempt "acquire a monopoly which is not plainly within the terms of the grant"); *see also Henry v. A.B. Dick Co.*, 224 U.S. 1, 70 (1912) (White, C.J., dissenting) (arguing that tying of patented and unpatented goods represented an attempt by the patentee "to increase the scope of the monopoly granted by a patent."). *See Herbert Hovenkamp, The Rule of Reason and the Scope of the Patent*, 52 SAN DIEGO L. REV. 515 (2015) (discussing meaning and effects of "scope of the patent" doctrine in antitrust law).

⁹³*Henry v. A.B. Dick Co.*, 224 U.S. 1 (1912).

⁹⁴*Heaton-Peninsular Button-Fastener Co. v. Eureka Specialty Co.*, 77 F. 288, 296 (6th Cir. 1896).

⁹⁵*See id.* at 296 ("Their monopoly in an unpatented article will depend upon the merit of their patented device, and the extent to which other clinching devices are superseded by it.").

machine is determined.”⁹⁶ A few years later, Justice Lurton took the same position in *Henry v. A.B. Dick*, adding that the Sherman Act was not relevant.⁹⁷ To the argument that the tie served to extend the monopoly from the patented machine to the unpatented supplies Lurton replied that this was nonsense:

The stencil, the paper, and the ink made by the patentee, will continue to be unpatented. Anyone will be as free to make, sell, and use like articles as they would be without this restriction, save in one particular, namely, they may not be sold to a user of one of the patentee's machines with intent that they shall be used in violation of the license.⁹⁸

That statement –obvious to some but heretical to others -- became the focus of a century long debate over the proper scope of the patent “monopoly.” To Progressives like Justices Brandeis and Douglas, and Thurman Arnold’s New Deal Antitrust Division, the patent itself created a “monopoly,” and the tie extended it beyond its lawful scope to unpatented supplies. Justice Lurton’s view ultimately prevailed: there is no monopoly unless the market creates one. Neither the Court nor the dissenters cited any evidence from the record indicating the extent to which the patent tie foreclosed the supply market from rivals. Justice Lurton apparently assumed – undoubtedly correctly – that the paper, stencils and ink that actually passed through A. B. Dick’s mimeograph machine accounted for a tiny percentage of total sales of those products.

Congress did not like the *Henry* result. Nevertheless, the language that became §3 of the Clayton Act seems verbally consistent with Lurton’s analysis. The statute made it unlawful to sell or lease a patented article on the condition or understanding that the purchaser not deal in the goods of a competitor, but only “where the effect of such lease, sale, or contract ... may be to substantially lessen competition or tend to create a monopoly....”⁹⁹ That is, it was not enough to show that the tying article was patented. The challenger also had to show a harmful impact on competition.

The Supreme Court largely ignored that constraint. In the 1930s and after it began to fashion rules prohibiting ties under both antitrust law and the patent “misuse” doctrine, but without seriously examining whether there was an impact on competition aside from the existence of the patent itself. Justice Brandeis opinion in the *Carbice* case adopted precisely the position that Lurton had rejected, concluding that a patentee’s requirement that purchasers

⁹⁶*Ibid.* (“The fasteners are thus made the counters by which the royalty proportioned to the actual use of the machine is determined.”)

⁹⁷*Henry v. A.B. Dick Co.*, 224 U.S. 1, 31 (1912).

⁹⁸*Id.* at 31-32.

⁹⁹15 U.S.C. §14.

of its ice box use its dry ice was an attempt to extend the patent unlawfully.¹⁰⁰ As Brandeis characterized it, the patentee was attempting “to employ the patent to secure a limited monopoly of unpatented material used in applying the invention.”¹⁰¹ By using the oxymoron “limited monopoly” he was referring to exclusive control of that portion of the dry ice that was used in the machine. It did not matter that dry ice was unpatentable and came from an inexhaustible supply of carbon dioxide.¹⁰² Brandeis also found support for this view in the Clayton Act, but without addressing the Act’s express limitation to ties that had a proven anticompetitive effect.¹⁰³

Acting at the behest of the Department of Justice, the Supreme Court turned this view into an affirmative antitrust cause of action in its 1947 *International Salt* case, condemning a patentee’s tying of ordinary unpatentable salt to its patented salt injection machine.¹⁰⁴ The Court held that monopoly would be presumed when the tying product was patented, rejecting the defendant’s argument that under the Sherman Act the tie must be shown to be unreasonable, or under the Clayton be shown to substantially lessen competition or create a monopoly.¹⁰⁵ It was enough for the court that the machine was patented and that the “volume of business affected by these contracts cannot be said to be insignificant....”¹⁰⁶ Thus was born the per se rule against ties.

Tying law has moved significantly since that time, initially by assessing a serious market power requirement,¹⁰⁷ and later by overruling the *International Salt* presumption that a patent itself confers the requisite monopoly.¹⁰⁸ As tying has become better understood it is increasingly clear that it is not simply a price restraint. Its principal uses are in furtherance of design and production. Sometimes it saves costs. For example, in the *Times-Picayune* case classified advertisers were required to advertise simultaneously in the morning and evening editions of a newspaper, for that

¹⁰⁰*Carbice corp. of America v. American Patents Development Corp.*, 283 U.S. 27 (1931).

¹⁰¹*Id.* at 33-34.

¹⁰²*See id.* at 29 (“The patent in suit is not for solid carbon dioxide. That article and its properties as a refrigerant have been long known to the public”).

¹⁰³*See id.* at 34 n. 4

¹⁰⁴*International Salt Co. v. United States*, 332 U.S. 392 (1947).

¹⁰⁵*Id.* at 396.

¹⁰⁶*Ibid.*

¹⁰⁷*United States Steel Corp. v. Fortner Enters. (Fortner II)*, 429 U.S. 610, 613 (1977); *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 26-29 (1984). *See* 10 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶1733e (4th ed. 2018) (forthcoming).

¹⁰⁸*Illinois Tool Works, Inc. v. Independent Ink, Inc.*, 547 U.S. 28 (2006).

way a typesetter could set identical pages for both editions.¹⁰⁹ In *Hyde*, the hospital's decision to use a single firm to provide anesthesiological services was very likely related to quality control and risk management. In any event it is difficult to see how a hospital can profit by making the market for anesthesiological services less competitive. A hospital, which is vertically related to its providers, generally profits when individual providers offer the best combination of high quality care and competitive prices.

The trick in these cases is to determine when tying is a production decision and when it is merely a scheme for obtaining higher prices by reducing output. Except for a small number of ties that foreclose competitors, that is almost never the case.

1. Tying as a Substitute for Firms

Tying law's most significant departure from patent law occurred when businesses became seriously involved in developing contractual restricted distribution alternatives to the firm. The development of dedicated dealerships and business franchising reflected the fact that traditional lines between production and distribution were unravelling.¹¹⁰ Increasingly dealers became involved in performing "production" functions, not mere reselling. In practically every sense franchisees hold themselves out as producing representatives of the franchisor, so much so that customers typically do not know whether a franchise location is independently owned or a wholly owned subsidiary of the supplier.¹¹¹

Intellectual property rights are usually present in franchise or dealership tying cases, although mainly in the form of trademarks. These antitrust tying cases are renegade in the sense that they address economically beneficial, competitively harmless practices, nearly always arising in competitive markets. Few involve genuine foreclosure. Some cases do find extraction of profits from downstream firms.¹¹² They do this by setting the traditional classical production and distribution framework as the baseline, and then

¹⁰⁹*Times-Picayune Publishing Co. v. United States*, 345 U.S. 594, 623 & n. 45 (1953). See Herbert Hovenkamp, *Distributive Justice and the Antitrust Laws*, 51 GEO. WASH. L. REV. 1, 7 (1982).

¹¹⁰See HERBERT HOVENKAMP, *THE OPENING OF AMERICAN LAW: NEOCLASSICAL LEGAL THOUGHT, 1870-1970*, Chs. 7 & 11 (2015).

¹¹¹Good literature on this subject includes Benjamin Klein, *The Economics of Franchise Contracts*, 2 J. CORP. FIN. 9 (1995); Benjamin Klein & Lester F. Saft, *The Law and Economics Of Franchise Tying Contracts*, 28 J.L. & ECON. 345 (1985); Paul H. Rubin, *The Theory of the Firm and the Structure of the Franchise Contract*, 21 J.L. & ECON. 223 (1978) at 227; G. Frank Mathewson & Ralph A. Winter, *The Economics of Franchise Contracts*, 28 J.L. & ECON. 503 (1985).

¹¹²*Siegel v. Chicken Delight, Inc.*, 448 F.2d 43 (9th Cir. 1971).

measuring from that. In the traditional framework a manufacturer produced its product, set the price and sold it to an intermediary or dealer, and that was the end of the matter. The baseline was competition, identified by marginal cost pricing. In a franchise case, by contrast, the franchisor not only sells a product, it also licenses business methods, trademarks, perhaps trade secrets and copyrights, and goodwill. Overcharges on tied products perform a royalty function and the aggregate of franchisee or dealer payments operate as a form of co-investment. Given the presence of intellectual property rights, good will, and metering, prices are invariably above marginal cost.

Siegel v. Chicken Delight,¹¹³ one of the earliest franchise tying cases, illustrates the issues. Chicken Delight was a nondominant fast food franchisee with a declining market share.¹¹⁴ Its franchise fee was zero, but it required franchisees to purchase certain equipment and food items at an overcharge. The antitrust claim was for these purchases, trebled.¹¹⁵ The court apparently realized that this overcharge was in fact a substitute for a royalty, so it remanded for a determination what the damages should be.¹¹⁶ Its only basis for thinking there would be any damages at all was that a franchise fee would have been negotiated up front, while the overcharge was added later to actual purchases and might have been unknown at the time the franchise was negotiated.¹¹⁷

Franchise ties occur because the franchisor is attempting to achieve the same structure of production that it would obtain through wholly owned subsidiary stores. If a fried chicken restaurant chain supplied its own cooking equipment, food items and paper products to its stores, no one would have given the practice a second look. And one would expect an automobile manufacturer that owned its own dealerships to use its own repair parts. Further, the owner would earn different amounts from different locations depending on their profits or volume of business. When the individual restaurants or dealerships are independently owned, however, the same practices are transformed into tying.¹¹⁸ The same thing is true of so-called

¹¹³*Ibid.*

¹¹⁴The court inferred market power from the fact that the franchisor's name was trademarked. *See id.* at 49-50.

¹¹⁵*Id.* at 51.

¹¹⁶*Id.* at 53.

¹¹⁷*Ibid.*

¹¹⁸*See also* *Metrix Warehouse, Inc. v. Daimler-Benz Aktiengesellschaft*, 828 F.2d 1033 (4th Cir. 1987) (Mercedes Benz unlawfully required dealers to use its own repair parts); *Tire Sales Corp. v. Cities Serv. Oil Co.*, 637 F.2d 467 (7th Cir. 1980), cert. denied, 451 U.S. 920 (1981) (unlawful for nondominant gasoline station franchisor to require its dealers to purchase its tires, batteries and automotive accessories); *Collins v. International Dairy Queen*, 939 F. Supp. 875 (M.D. Ga.

“full-line forcing,” a type of tying arrangement in which dealers are required to handle the full line of the franchisor’s output. The models that the franchisee wants to sell are the “tying” product, while those it does not want are the “tied” product.¹¹⁹ By contrast, a manufacturer that owned its own dealership would naturally want to sell its entire line.

Antitrust courts have largely come to realize this, and the day of the franchise tying arrangement antitrust case may be over. In particular, the Supreme Court’s *Illinois Tool Works (ITW)* case¹²⁰ precluded the inference of tying product market power from a patent and, *pro tanto*, from other IP rights as well.¹²¹ Given that nearly all franchise distribution markets are competitive an unlawful tie in such a market would be a rarity, and there are virtually no cases finding illegality in a franchise case subsequent to the *ITW* decision.

2. Metering Ties

a. Uses and Effects

In a metering, or variable proportion, tie the purchaser uses one unit of a durable tying product, such as a camera or printer, and must purchase from the same seller its varying needs of some tied product, such as film or toner cartridges. Most of the nineteenth century patent cases discussed previously involved variable proportion ties.¹²² The main portion of the patented device was a durable good, but various components (needles, wax discs, ink, cutters, ribbons, and the like) wore out quickly or could be used only once. These needed to be replaced or restocked in proportion to how

1996) (DQ could have unlawfully tied its franchise to requirement that franchisee purchase cookies it Blizzard ice cream product from franchisor), overruled on other grounds, *Maris Distributing co. v. Anheuser-Busch, Inc.*, 302 F.3d 1207 (11th Cir. 2002). *See also* *Carpa v. Ward Foods*, 536 F.2d 39, 47 (5th Cir. 1976) (nondominant defendant’s “Zuider Zee” seafood restaurants unlawfully required franchisees to use its restaurant equipment).

¹¹⁹*E.g.*, *George Lussier Enterp v. Subaru of New England*, 1999 WL 1327396 (D.N.H. Dec. 13, 1999) (refusing to dismiss claim of unlawful tying where car manufacturer required dealers to take slower selling models as well as the more desirable ones). *Cf.* *Menominee Rubber co. v. Gould, Inc.*, 657 F.2d 164 (7th Cir. 1984) (sustaining preliminary injunction under both state law and federal antitrust law in favor of dealer terminated because it refused to promote supplier’s full line of hose fittings).

¹²⁰*Illinois Tool works, Inc. v. Independent Ink, Inc.*, 547 U.S. 28 (2006).

¹²¹*See, e.g.*, *Sheridan v. Marathon Petroleum Co., LLC*, 530 F.3d 590 (7th Cir. 2008) (under *ITW*, sufficient market power to support tying claim could not be inferred from trademark).

¹²²*See* discussion *supra*, text at notes __.

intensely the machine was used.

Variable proportion ties can accomplish several things. Sometimes they simply meter use of a leased or purchased device, serving as a substitute for a patent or other IP royalty.¹²³ For example, the inventor of a printer covered by patents might sell the printer at a certain price but install an electronic counter, charging the user so much per page.¹²⁴ It could accomplish the same thing by requiring the purchaser to buy its own toner cartridges, at an upcharge equal to the royalty. In both situations, it would earn more from higher volume users. In other cases, metering ties enable a firm to accomplish through contracting partners what it would ordinarily accomplish for itself. For example, a restaurant chain that owned its locations would earn more revenue from higher volume locations. Metering ties enable a firm to accomplish the same thing through independent franchisees, although it could also use a license fee based on revenue.

Variable use royalties are an important inducement to technology development because they provide larger payoffs as inventions are more heavily used. This is why per usage patent royalties have been around for many decades.¹²⁵ Variable proportion ties perform the same function.

The terms “price discrimination” and “metering” might appear to be synonyms, but they can refer to quite different things. Price discrimination occurs when a seller earns different rates of return on different sales – or more precisely, when the sales occur at different ratios of price to marginal cost. By contrast, “metering” need not involve price discrimination at all. In some cases, metering reflects no more than the differential costs that variable use imposes on the seller or lessor. For example, suppose I lease a metal press that costs precisely 20 cents per stamp to operate. My lease rate is a fixed fee plus 20 cents per stamp. In that case I am metering but probably not price discriminating. The variable fee simply covers my costs. By contrast, if use of the device costs me 20 cents but I charge a usage fee of 30 cents, I will be

¹²³*E.g.* *Casey v. Diet Center*, 590 F. Supp. 1561, 1570 & n.13 (N.D. Cal. 1984) (tie exploited franchisees no more than a “variable royalty based on a percentage of [the franchisee's] revenue”).

¹²⁴*See, e.g.*, *Killian v. Commissioner*, 1942 WL 8937 (U. S. Bd. Tax App. Jan. 21, 1942) (licensor of production technology used meters on machines to measure output for computation of royalties); *Mid-America ICEE, Inc. v. John E. Mitchell Co.*, 1973 WL 856 (D. Or. Aug. 7, 1973) (defendant franchisor of ICEE brand frozen drinks experimented with electronic meter to count the number of cups). Such meters are also used to measure oil and gas royalties by computing production at the wellhead. *See Lang v. Weiss Drilling Co.*, 70 N.E.3d 625 (Ohio App. 2016); *Sowell v. Natural Gas Pipeline Co. of America*, 604 F. Supp. 371, 373 (N.D. Tx. 1985).

¹²⁵*See, e.g.*, *Kelley v. Porter*, 17 F. 519 (C.C.D.Cal. 1883) (patent calling for royalty of \$3 per dozen boots manufactured by patentee’s machine).

obtaining a higher rate of return from higher intensity users. For example, the pizza franchisor which requires its franchisees to purchase its own pizza dough at a premium price is not merely metering. It is earning a higher rate of return from franchisees who sell more pizza, because they purchase more dough.¹²⁶ Likewise, the patentee who licenses out a process patent on a royalty measured by use incurs no per use costs. Thus it has a higher rate of return from higher intensity users.

Nearly all the litigated variable proportion tying cases involve intellectual property rights, most commonly patents or trademarks.¹²⁷ The seller typically lowers the price of the tying product, often below marginal cost and sometimes even to zero,¹²⁸ and charges a premium for the tied product. As a result, the seller earns more from high volume users who consume more of the tied product.

Most variable use royalties, including patent royalties, and discriminatory metering ties result in prices that are higher than short run marginal cost.¹²⁹ As a result, if they are viewed in a purely static model they appear to reduce welfare from some hypothetical competitive norm.¹³⁰ For example, a 3% royalty on a process patent or a 10% royalty on a book is deadweight loss in a static model because the marginal cost to the rights holder is zero. The book royalty might increase the cost of the book from \$20 to \$22 even though the royalty recipient (author) has no marginal costs of production. That price increase transfers wealth away from those

¹²⁶*E.g.*, *Queen City Pizza, Inc. v. Domino's Pizza, Inc.*, 124 F.3d 430 (3d Cir. 1997) (unsuccessful challenge to Domino's requirement that franchisee's purchase its pizza dough at a premium price).

¹²⁷One possibility that did not involve IP rights is *Northern Pacific Railway Co. v. United States*, 356 U.S. 1 (1958) (condemning "preferential routing" covenants in land sales by railway to farmers, requiring latter to ship on the defendant's railroad; presumably different farmers shipped different amounts, although Court did not discuss the issue; the Court discussed harm entirely in terms of exclusion – in this case, taking away the farmers' "freedom to deal with competing carriers"; *id.* at 8).

¹²⁸*E.g.*, *Siegel v. Chicken Delight, Inc.*, 448 F.2d 43 (9th Cir. 1971) (price of tying product, the franchise, was zero). *See* Erik N. Hovenkamp & Herbert Hovenkamp, *Tying Arrangements and Antitrust Harm*, 52 ARIZ. L. REV. 925, 942-943 (2010) (discussing Coca-Cola's practice of providing a free soft drink dispensing machine to qualifying employers, subject to the condition that the machine be stocked exclusively with Coca-Cola products).

¹²⁹A perfectly calibrated metering tie that did not price discriminate could reflect marginal cost pricing. For example, if the marginal cost of using the press is 20 cents per stamp and the patentee charges that amount, the result might be metering at marginal cost.

¹³⁰In a pure patent license marginal cost is zero, so any positive royalty would appear to reduce output from marginal cost pricing of the same technology.

customers who actually buy, and causes deadweight loss with respect to those customers who choose not to buy at a price of \$22.

This example ignores incentive effects, however. The function of both royalties and variable proportion ties is to induce innovation or entrepreneurial risk taking. An IP royalty seems to harm consumer welfare only if we compare it with a regime in which producers get access to the same rights at a price of zero.

b. Metering Ties and the Nonmonopolist

Ignoring incentive effects, when the seller has a monopoly in the tying product and the tied product is perfectly competitive, such ties may reduce short run consumer welfare from the single monopoly price, at least if they also reduce output of the durable good.¹³¹ However, that result appears to be trivial across the range of litigated variable proportion tying cases. The sellers in these cases are virtually never monopolists or even close. In the Lexmark printer-cartridge tying case that has gone twice to the Supreme Court,¹³² printer maker Lexmark had less than five percent of the fiercely competitive market for computer printers.¹³³ In *Siegel v. Chicken Delight*,¹³⁴ a well known antitrust case condemning a franchisor's variable proportion tie, Chicken Delight was a struggling franchisor fighting a losing battle against Kentucky Fried Chicken and other fast food restaurants.¹³⁵ Like many struggling, nondominant franchisors, Chicken Delight gave its franchise away for free but used a variable proportion tie with an upcharge on tied products to obtain its revenue.¹³⁶ Strategies that are profitable for a

¹³¹Einer Elhauge and Barry J. Nalebuff, *The Welfare Effects of Metering Ties*, 33 J. L., Econ. & Org. __ (2017), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2591577 (based on a model in which the tying firm is a monopolist in the tying product and the tied product is perfectly competitive). The authors also show that on realistic assumptions second degree price discrimination increases welfare only if it increases output.

¹³²*Lexmark Int'l, Inc. v. Static Control Components*, 134 S.Ct. 1377 (2014); *Impression Products, Inc. v. Lexmark Int'l, Inc.*, 137 S. Ct. 1523 (2017).

¹³³See <https://www.therecycler.com/posts/weak-demand-for-printers-and-cartridges-affects-lexmark/> (Dec. 10, 2015) (Lexmark's printer market share estimated as 4.5%).

¹³⁴*Siegel v. Chicken Delight, Inc.*, 448 F.2d 43 (9th Cir. 1971).

¹³⁵See William Whitworth, "Kentucky-Fried," *THE NEW YORKER*, Feb. 14, 1970), available at <http://www.newyorker.com/magazine/1970/02/14/kentucky-fried>.

¹³⁶*Chicken Delight*, 448 F.2d at 46-47, observing that Chicken Delight:

... charged its franchisees no franchise fees or royalties. Instead, in exchange for the license granting the franchisees the right to assume its

nonmonopolist must have at least one nonmonopolistic explanation.

By contrast, the patentee in the *Motion Picture Patents* case appears to have been a dominant firm, but its metering tie was also exclusionary, intended to drive competing film makers out of the market or limit their growth.¹³⁷ That was also true of the 1936 *IBM* case, where an arguably dominant firm tied computer tabulating cards to its computer leases, but the tying was addressed as an exclusionary practice directed against rivals in the card market.¹³⁸ Variable proportion technology ties, discussed at greater length below,¹³⁹ are more difficult to classify, but they are always challenged as exclusionary practices.

One example of a technological variable proportion tie imposed by a dominant firm is the Kodak Instamatic, which was the subject of the *Berkey Photo* litigation.¹⁴⁰ Kodak's simultaneous introduction of a new miniaturized camera and sealed film cartridges that worked only with each other very likely enabled Kodak to earn higher returns from high intensity users.¹⁴¹ At the same time, however, the camera/film package was a substantial technological advance, and the only way to open up the tie would have been for Kodak to relinquish its intellectual property rights in either the camera or the film cartridges. In any event, the alleged harm was foreclosure of a competitor, the plaintiff Berkey Photo.

identity and adopt its business methods and to prepare and market certain food products under its trade-mark, Chicken Delight required its franchisees to purchase a specified number of cookers and fryers and to purchase certain packaging supplies and mixes exclusively from Chicken Delight. The prices fixed for these purchases were higher than, and included a percentage markup which exceeded that of, comparable products sold by competing suppliers.

See also ROGER D. BLAIR & FRANCINE LAFONTAINE, *THE ECONOMICS OF FRANCHISING* 59 (2005) (most up-front franchise fees are very low in relation to value of business);

¹³⁷*Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502 (1917). *See* note __, *infra*.

¹³⁸*IBM Corp. v. United States*, 298 U.S. 131, 139 (1936). The Court made no attempt to compute IBM's market share for either computers or cards, but referred to IBM frequently as having a "monopoly" in the computers simply because it owned patents. Further, the action had been brought not only against IBM, but also against its competitor Remington Rand. *See* 13 F. Supp. 11 (S.D.N.Y. 1935). The district court also predicted that, given that the cards themselves were unpatented, enjoining the tie would increase competition in the cards. *Id.* at 20.

¹³⁹*See* discussion *infra*, text at notes __.

¹⁴⁰*Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263 (2d Cir. 1979).

¹⁴¹*See* HERBERT HOVENKAMP, *FEDERAL ANTITRUST POLICY: THE LAW OF COMPETITION AND ITS PRACTICE* §10.6e (5th ed. 2015).

Berkey Photo illustrates some of the assessment problems that arise when innovative products that incorporate technological ties are introduced. If we argue that this particular metering tie reduces welfare, the question is in reference to what? The previous technology, which was the old fashioned Brownie camera with rolled film? Hardly, or customers would not have substituted away from it in droves.¹⁴² So the argument must be that we want to permit Kodak to innovate the new camera/film combination, but we want it to obtain less revenue from customers than the variable proportion tie enabled it to do. One way to do that might be to permit Kodak to set a single price on the camera, but force the film to be sold at marginal cost. That would turn Kodak into a single price monopolist, but it would also involve an antitrust court in price regulation of a kind that it has always avoided.

Alternatively we might do what plaintiff *Berkey Photo* requested, which is force Kodak to predisclose its technology in order to give rivals a head start, perhaps with the result that the film would be sold in a competitive market.¹⁴³ It is hard to come up with a remedy more hostile toward innovation than that one, and the Second Circuit was wise to reject it as a matter of law.¹⁴⁴ For example, assuming it took a copyist two years to invent around Kodak's patents, a two year predisclosure requirement could deprive Kodak of its entire innovation investment by forcing its returns down to the competitive level. Of course, the court might pick a shorter predisclosure period – say one year. This would force Kodak to share some but not all of its returns. That would involve an antitrust court – with no statutory warrant – to get involved in regulating the proper return to innovation, and in a situation where the result would be highly speculative at best.

The dominant explanation for metering or variable proportion ties is that they can increase output because the seller lowers the price of the tying product, enabling more purchasers to buy. It then increases the price of the tied product. For buyers who would not be in the market at all at the standalone price¹⁴⁵ the tie is an unambiguous gain. For buyers who would have been in the market anyway, individual welfare depends on intensity of use. Lower volumes users come out ahead because the increased price they pay for the tied good is more than offset by the price reduction in the tying good. Higher volumes users lose out unless they are able to predict in

¹⁴²See *Berkey Photo*, 603 F.2d at 269 (describing success of Instamatic camera/film package).

¹⁴³ See *id.* at 279-282.

¹⁴⁴*Id.* at 279-284 (discussing and rejecting predisclosure requirement). The trial judge had permitted the jury to decide whether refusal to predisclose was unlawful if it made “it impossible for a competitor to compete with Kodak,” and the jury found for *Berkey Photo*. *Id.* at 281.

¹⁴⁵That is, the price if the seller were prohibited from tying.

advance that their costs will be higher. In that case they will switch to an alternative if one is available.

That is why monopoly power in the tying product is essential for consumer harm. Otherwise any purchaser who would be worse off under the tie would substitute to a different seller. To illustrate, suppose the seller of a durable printer cuts the price by \$100 below the competitive level but ties cartridges at an upcharge of \$10 each. The customer who would not be in the market at the old price but who buys at the lower price experiences a clear gain. The seller gains as well from sales to this customer, provided that the combined printer-cartridge price is profitable. Ignoring the time value of money, the printer user who knows she will use fewer than ten cartridges will also gain, knowing that the printer discount more than offsets the increased cartridge costs. By contrast, the printer user who knows in advance that she will use more than ten cartridges during the relevant time period will purchase from a competitor whose printer accepts generic cartridges. If the printer seller is not a monopolist and the printer makers are not colluding, this substitution will occur. The nonmonopolist printer seller would lose all of these high intensity customers to rivals.

The vast majority of variable proportion ties are imposed by nonmonopolists. In that case their source of profit cannot be sales that harm high volume users, for these will have substituted to a competitor. Rather, the nonmonopolist's source of profit results from the price cut in the tying product that induces more people to purchase the tying product. No class of consumers is harmed.

c. Metering Ties, Antitrust Policy, and the Design of Production

Should variable proportion ties ever be condemned? Never, if the defendant is not a monopolist in the tying product market. Perhaps, if the defendant is a monopolist and the tie forecloses rivals unreasonably. That was very likely the case of the *Motion Picture Patents* tie, in which the patentee used a projector-film tie as part of an attempt to control the infant American film market.¹⁴⁶ Most of the variable proportion tying cases do not foreclose anyone because no monopoly exists in the tying product and the

¹⁴⁶*Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502 (1917). On the monopolistic story of *MPPC*, see MICHAEL CONANT, ANTITRUST IN THE MOTION PICTURE INDUSTRY: ECONOMIC AND LEGAL ANALYSIS 16-21 (1960); BENJAMIN B. HAMPTON, A HISTORY OF THE MOVIES (THE LITERATURE OF CINEMA) 8-11, 17-24, 34, 64-76, 79-81 (1931); LEWIS JACOBS, THE RISE OF THE AMERICAN FILM: A CRITICAL HISTORY, 1921-1947, at 81-85, 88, 164-65, 291-92 (1968).

tied products are common commodities.

For nonforeclosing ties addressed under §1 of the Sherman Act, the tie is lawful unless it restrains trade. That would require, first, that the firm have significant market power in the tying market.¹⁴⁷ Second, once a monopolist is found it would have to be shown that the tie actually impaired competition. While such a case might be possible, I am unaware of any among numerous variable proportion tying cases in which these two requirements have been proven.

More fundamentally, the argument against variable proportion ties is a misconceived venture that treats as a price restraint a practice that is really a design or production choice. To the extent that variable proportion ties involve goods that are protected by IP rights, the variable proportion tie is an important – and quite ordinary -- device for incentivizing development in that particular market. That is why we have royalties on IP rights in the first place.¹⁴⁸ In the franchise and other restricted dealership cases, variable proportion ties are ways of incentivizing developing by reducing the costs of franchisee or dealer entry and enabling both the franchisor and the franchisee to profit from higher sales. The principal lesson here is that the metering tie should be viewed as a design or production tool, not as a constraint on pricing.

3. Technological Ties; Direct Attacks on Innovation

A technological tie, or “tech tie” occurs when two products are bound together by technological design rather than contract. As a result, at least in the straightforward case the creation of a tech tie is a unilateral act that is not covered by §1 of the Sherman Act or §3 of the Clayton Act. It must be addressed as monopolization or attempt to monopolize under §2 of the Sherman Act. This also entails that the practice can be condemned only if it is “exclusionary.” Because a firm acting unilaterally can set any price it pleases, mere extraction of higher prices does not violate §2.¹⁴⁹

Tech ties can come in both variable and fixed proportion. A good example of a variable proportion tech tie is *Berkey Photo*, where Kodak simultaneously introduced a revolutionary camera design, the Pocket

¹⁴⁷Elhauge and Nalebuff, *supra* note __, apparently agree. *See id.* at _ (assuming a monopolist in the tying product).

¹⁴⁸Elhauge & Nalebuff, *supra* note __ at __, do recognize that patents increase innovation incentives and at one point suggest the possibility of time-limited variable proportion ties. In the case of a patent, the lifetime is twenty years or less, but copyrights typically last a century and trademarks never expire.

¹⁴⁹*See* 3A PHILLIP E. AREEDA & HERBERT HOVENKAMP ¶720 (4th ed. 2015). On technology ties as Sherman §2 violations, see 3B *id.* ¶¶776-777.

Instamatic, along with sealed film cartridges.¹⁵⁰ Both the camera and the cartridges were protected by patents and would work only with each other. As a result, for some period of time someone using the camera had to use Kodak's film as well, but the proportion varied depending on how many photos that person made. As a result, the purpose of the tie was very likely price discrimination or metering.

An example of a fixed proportion tech tie is Microsoft's "commingling" of the code for its Internet Explorer browser into the Windows computer operating system.¹⁵¹ Once the browser code had been written into the Windows operating system, someone could purchase a copy of Windows only by purchasing Internet Explorer as well. In that case the anticompetitive purpose of commingling was exclusion, targeting Netscape, which was a rival in the browser market.¹⁵² The tie was fixed proportion because one copy of Windows invariably included one copy of Internet Explorer.

Tech ties have become by far the most important vehicle for direct attacks on innovation. The typical plaintiff, such as Berkey, is a manufacturer of a complementary product claiming that its own product was excluded from the market by means of the defendant's redesign. The tortured history of antitrust litigation against IBM in the 1970s and 1980s also argued that by pulling various components into a single, miniaturized box, IBM destroyed the market for old style peripheral products.¹⁵³

Few plaintiffs have been so brazen as to argue that antitrust should condemn an innovation simply because the innovated product was more desirable to consumers and thus took sales away from competitors committed to older technology. Rather, competitors have made other arguments. One, considered and wisely rejected in *Berkey Photo*, was that the developer of market shifting technology had a duty to predispose it to rivals so that they

¹⁵⁰*Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263 (2d Cir. 1979). See discussion *infra*, text at notes ___.

¹⁵¹*United States v. Microsoft Corp.*, 253 F.3d 34, 64-65 (D.C.Cir. 2001).

¹⁵²*Id.* at 64 (observing that commingling prevented computer manufacturers (OEMs) "from pre-installing other browsers and deterred consumers from using them.")

¹⁵³*E.g. Memorex Corp. v. IBM Corp.*, 636 F.2d 1188 (9th Cir. 1980) (per curiam), cert. denied, 452 U.S. 972 (1981); *Telex Corp. v. IBM*, 510 F.2d 894 (10th Cir.) (per curiam), cert. dismissed, 423 U.S. 802 (1975); *Transamerica Computer Co. v. IBM*, 698 F.2d 1377 (9th Cir. 1983). The parent of these cases was *in re IBM Corp.*, which the government voluntarily dismissed after thirteen years of litigation. See 687 F.2d 591 (2d Cir. 1982) (noting dismissal by stipulation). For a recap by a critic, see John E. Lopatka, *United States v. IBM: A Monument to Arrogance*, 68 Antitrust L.J. 145 (2000). For an analysis by IBM's principal economic expert, see FRANKLIN FISHER, JOHN J. MCGOWAN AND JOEN E. GREENWOOD, *FOLDED, SPINDLED, AND MUTILATED: ECONOMIC ANALYSIS OF U.S. v. IBM* (1983).

could prepare themselves.¹⁵⁴

Another rejected claim was in essence of predatory pricing. IBM introduced new, smaller models of its computers at a price significantly lower than that of previous technology.¹⁵⁵ Looking at the production costs of the new line, the prices were above all relevant measures of cost. However, the plaintiff argued that IBM introduced the new computers while there was still commercial life remaining in the old line, and that the foregone profits on the old line – which it characterized as “impact costs” – should also be considered in computing IBM’s costs on the new line. The district court concluded that including such “impact costs” in the cost of a new product would operate as a “disincentive to research and innovation,” essentially forcing dominant firms to continue to sell an existing product as long as it had commercial life remaining.¹⁵⁶

Finally, the plaintiff in *Allied Orthopedic*, which involved a medical device, made an unsuccessful “welfare tradeoff” argument.¹⁵⁷ It urged that to the extent the introduction of new technology harmed those committed to the previous technology, the incremental costs of this harm should be balanced against the incremental benefit produced by the innovation. The Ninth Circuit rejected this argument categorically and as a matter of law.¹⁵⁸

¹⁵⁴ See discussion *supra*, text at notes ____.

¹⁵⁵ *Transamerica Computer Co. v. IBM*, 459 F. Supp. 626 (N.D. Cal. 1978), *aff’d*, 698 F.2d 1377 (9th Cir.), cert. denied, 464 U.S. 955 (1983).

¹⁵⁶ 459 F. Supp. at 631. As the district court characterized and concluded:

For example, the introduction of a popular and revolutionary new tape device may give rise to impact costs (reductions in anticipated profits) as the result of the withdrawal from production of an outmoded tape device, and also impact costs that result from customers switching from older but continued tape devices to the newer model. Again TCC [the plaintiff] would take these costs beyond the planning stage and subtract them from the new product's profits in determining whether the price set was predatory and below cost. Such a rule of law would be a disincentive to research and innovation, and has all the drawbacks that calculation of opportunity costs would impose. Neither opportunity nor impact costs (as defined here) may be included in determining whether a price is predatory.

Id. at 631-632.

¹⁵⁷ *Allied Orthopedic Appliances, Inc. v. Tyco Health Care Group, LP*, 592 F.3d 998 (9th Cir. 2010).

¹⁵⁸ See *id.* at 1000:

There is no room in this analysis for balancing the benefits or worth of a product improvement against its anticompetitive effects. If a monopolist's design change is an improvement, it is “necessarily tolerated by the antitrust laws,” unless the monopolist abuses or leverages its monopoly power in some other way when introducing the product. To hold otherwise “would

Rather, the court held, if the innovation was a genuine product improvement then there would be no basis for “balancing,” and thus no antitrust liability.

One exception, acknowledged but not often found, is the technological change that is not an improvement at all but was adopted exclusively because it made a rival’s complementary product incompatible. In *C.R. Bard* the Federal Circuit approved a jury verdict to that effect.¹⁵⁹ The antitrust defendant had a dominant position in a durable medical skin sample gun, which used single-use needles to capture small pieces of skin from patients for laboratory study. The needles were generic and supplied by the defendant, the plaintiff, and others. The defendant then re-engineered the collar fastening the needle to the gun, with a patented connector that served to make the plaintiff’s needles incompatible with the gun, thus giving the defendant the entire market for the needles as well. The jury found that the re-engineered collar was not a technological improvement at all, but was created only to make the plaintiff’s needles incompatible.

Consistent with both *Allied Orthopedic* and *C.R. Bard*, in the *Apple iTunes* case the jury was asked if Apple’s modifications to its software that made rivals’ devices incompatible had a legitimate technological purpose.¹⁶⁰ The plaintiff had argued that Apple’s repeated modifications of its iTunes software rendered non-Apple devices incompatible with the iTunes database. Apple defended by arguing that the modifications were necessary to deal with evolving security issues. When the jury answered yes, that the modifications were genuine improvements, the complaint was dismissed.¹⁶¹

The *iTunes* case raises an interesting question, however, about whether there should be a “software exception” to the general rules giving virtual *carte blanche* to design changes. One reason for extreme deference to product

be contrary to the very purpose of the antitrust laws, which is, after all, to foster and ensure competition on the merits.” “Antitrust scholars have long recognized the undesirability of having courts oversee product design, and any dampening of technological innovation would be at cross-purposes with antitrust law.”

(internal references omitted).

¹⁵⁹*C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340 (Fedi. Cir. 1998), *cert. denied*, 526 U.S. 1130 (1999). *See also* *Xerox Corp. v. Media Sciences, Int’l, Inc.*, 511 F.Supp.2d 372 (S.D.N.Y. 2007) (finding that a Xerox rival stated a claim of frivolous, exclusionary design for solid printer ink). Other cases are discussed in 3B PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶777b (4th ed. 2015).

¹⁶⁰*See* *Apple iPod iTunes Antitrust Litig.*, 2014 WL 4809288 (N.D. Cal. Sep. 26, 2014) (granting summary judgment in Apple’s favor on any redesign conceded to be a genuine product improvement).

¹⁶¹*See* *Apple Wins Decade-Old Suit Over iTunes Updates*, *NEW YORK TIMES*, Dec. 16, 2014 (noting jury instruction on “genuine product improvement”).

design changes is that they are usually both costly and risky and we do not want to use antitrust law to destroy the incentive to innovate.

Software may be different, however, because a code change that makes a competitor's complementary product worthless might not involve very much in the way of cost or risk at all.¹⁶² For example, the D.C. Circuit condemned Microsoft's "commingling" of operating system and browser code into a single program, concluding that the combination did not improve functionality but did serve to exclude rival browser Netscape.¹⁶³

The judicially manageable software case would be the one analogous to *C.R. Bard*, where the jury found that the product redesign was never intended to be an improvement but was adapted simply to make rival complementary products incompatible.¹⁶⁴ But what about the *iTunes* case, where the jury found that Apple's software designs were in fact improvements and the court then found for the defendant. Cases such as that raise the possibility of extremely minor improvements effected through changes in a few lines of code, but doing considerable harm to rivals and perhaps consumers by creating incompatibilities.

Here, there is much to be said for the Ninth Circuit's admonition that courts are poorly equipped to "balance" innovation improvements against competitive harm.¹⁶⁵ Antitrust's rule of reason can address the issue, however, without the need to balance, at least in all but a few cases. The difficult decisions will be those finding both a genuine improvement from the innovation and creation of incompatibility with rivals' products. At that point, however, antitrust policy still rightfully insists on a query into "less restrictive alternatives." The fact finder must make sure that the incompatibility is reasonably essential to the product improvement.¹⁶⁶ Rewriting a few lines of code that makes a rival's device incompatible may be a product improvement, but perhaps the same improvement could have been achieved without creating the incompatibility. That question may not

¹⁶²For a good explication, see John M. Newman, *Anticompetitive Product Design in the New Economy*, 39 FLA. ST. U. L. REV. 681 (2012). See also Suzanne Van Arsdale and Cody Venzke, PREDATORY INNOVATION IN SOFTWARE MARKETS, 29 HARV. J.L. & TECH. 243 (2015).

¹⁶³*United States v. Microsoft Corp.*, 253 F.3d 34, 64-65 (D.C.Cir. 2001) (condemning commingling of operating system and internet browser code under §2 of Sherman Act).

¹⁶⁴See discussion *supra*, text at notes ____.

¹⁶⁵*Allied Orthopedic Appliances, Inc. v. Tyco Health Care Group, LP*, 592 F.3d 998, 998-1000 (9th Cir. 2010).

¹⁶⁶See Herbert Hovenkamp, *The Rule of Reason*, ____ FLA. L. REV. ____ (2018) (in press); C. Scott Hemphill, *Less Restrictive Alternatives in Antitrust Law*, 116 COLUM. L. REV. 927 (2016).

be easy to answer, although it is subject to expert testimony. Most importantly, however, the existence of such a rule should give dominant firms an ex ante incentive to redesign in a way that achieves their declared goals without creating greater incompatibilities than are necessary.

IV. Horizontal Agreements – Distinguishing Distribution from Production

Agreements among competitors is another class of restraints where distinguishing production from distribution is vital. Although they have not been classified as such, naked cartels are actually restraints on distribution. They have nothing to do with design, development, or production. Rather they are agreements about the price at which a completed good will be sold. While the Supreme Court has mischaracterized some agreements, it has generally held that if the only thing an agreement does is provide collaborative selection of the “correct” price, it is unlawful per se.

For example, in the Gilded Age railroad cartel cases, which were the first antitrust cases that the Supreme Court decided on the merits,¹⁶⁷ the defendants raised “ruinous competition” as a defense. The argument was a popular one at the time, supported by the economic theory of the day.¹⁶⁸ Many economists and critics of the antitrust laws believed that competition would not work in industries with high fixed costs. Prices would be driven to marginal cost, which is too low to support recovery of fixed cost investment. As a result, firms would compete themselves into bankruptcy until only one remained. Justice Peckham’s conclusion that the language of the Sherman Act reaches “every” restraint, and not just unreasonable restraints, eliminated the ruinous competition defense.¹⁶⁹

Eventually the ruinous competition argument was theorized away for all but a few cases of natural monopoly.¹⁷⁰ In any event, a serious deficiency of the ruinous competition defense was the belief that it justified competitor

¹⁶⁷United States v. Trans-Missouri Freight Ass’n, 166 U.S. 290 (1897); United States v. Joint Traffic Assn., 171 U.S. 505 (1898). The Supreme Court’s first Sherman Act case was United States v. E.C. Knight Co., 156 U.S. 1 (1895), but it did not reach the merits. Rather, the Court held that the restraint in question was out of reach of Congress’ Commerce power.

¹⁶⁸See HERBERT HOVENKAMP, ENTERPRISE AND AMERICAN LAW, 1836-1937, Ch. 23 (1991).

¹⁶⁹*Trans-Missouri*, 166 U.S. at 340 (rejecting argument that Sherman Act prohibits only unreasonable restraints).

¹⁷⁰In such works as JOHN MAURICE CLARK, STUDIES IN THE ECONOMICS OF OVERHEAD COSTS (1923); and EDWARD CHAMBERLIN, THE THEORY OF MONOPOLISTIC COMPETITION (1933). See Herbert Hovenkamp, *United States Competition Policy in Crisis: 1890-1955*, 94 MINN. L. REV. 311 (2009).

price fixing. If ruinous competition forced prices to too low a level, collusion would make them too high. That is, price fixers would not charge the competitive price necessary to maintain investment and production in the industry. Rather, they would charge the monopoly price. Even where ruinous competition exists, it does not justify pricing at monopoly levels.

Cartel pricing is an inferior solution for the ruinous competition problem for another reason. Ruinous competition usually results from significant economies of scale.¹⁷¹ Price fixing generates the collectively maximizing price among several inefficiently small firms, which will be both higher and more costly to administer than simple single firm monopoly pricing. For example, a cartel of five inefficiently small firms will maximize at a higher price than a lower cost single-firm monopolist in the same market. From the standpoint of pure production, it is better to permit the firms to compete until only one remains. Further, the monopoly outcome is not inevitable. Firms who find ways to differentiate their products may be able to survive and offer some competition to the dominant firm.

Today many price-affecting agreements among competitors are addressed under antitrust law's rule of reason, which means that they will be condemned only if the plaintiff can prove market power and anticompetitive effects.¹⁷² This occurs when the court believes that a price fix is really not a restraint on distribution at all, but rather an agreement that facilitates development or production.

Properly designed antitrust pleading and discovery is essential for distinguishing production arrangements from price restraints. Effective pleading rules force plaintiffs to be precise about why a particular agreement is unlawful, and defendants to be precise about why it is not. Once an antitrust complaint properly alleges price fixing the onus is on the defendants (assuming they are not disputing the facts) to explain (1) why the challenged

¹⁷¹Economists and lawyers understood the link already in the 1930s. See Edward S. Mason, *Price and Production Policies of Large-Scale Enterprise*, 29 AM. ECON. REV. 61 (1939); Louis L. Jaffe & Matthew O. Tobriner, *The Legality of Price Fixing Agreements*, 45 HARV. L. REV. 1164, 1164-1165 (1932). See Herbert Hovenkamp, *The Antitrust Movement and the Rise of Industrial Organization*, 68 TEX. L. REV. 105, 123 (1989). See also George Bittlingmayer, *Decreasing Average Cost and Competition: A New Look at the Addyston Pipe Case*, 25 J. L. & ECON. 201 (1982) (arguing that high fixed costs forced firms to merger in order to prevent ruinous competition).

¹⁷²*E.g.*, *Texaco, Inc. v. Dagher*, 547 U.S. 1 (2006) (approving joint venture of two refiners that fixed the price of their output); *California Dental Assn. v. FTC*, 526 U.S. 756 (1999) (approving price advertising restraints by professional association). See 7 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW*, Ch. 15 (4th ed. 2017).

agreement facilitates development; and (2) why the price fix is essential to this function.

Supreme Court antitrust cases are filled with instances in which defendants raised an improper defense. These include “ruinous competition” in the railroad cases,¹⁷³ but also the *Professional Engineers* defense that excessive price competition would force engineers to cut corners,¹⁷⁴ and the *NCAA*’s defense that a restraint on televised college football games would bolster live game attendance.¹⁷⁵ These defenses are fundamentally arguments that cartel prices are necessary to preserve the right amount of competition in the industry. Importantly, they require market dominance in order to be effective. That is, neither the *Professional Engineers* restraint nor the *NCAA* restraint would work unless those participating in the agreement controlled a dominant share of a relevant market. By contrast, a defense related to improved innovation or production works even for nondominant groups. Indeed, it works better because nondominant ventures have more to gain from practices that reduce their costs or improve their products.

In the railroad cases the companies had simply articulated the wrong defense. That may not be surprising given that at the time there was no history of federal antitrust law regarding price fixing. They were writing on a clean slate. In fact, the challenged railroad agreements were actually production joint ventures. The Interstate Commerce Commission supported them and the Eighth Circuit had approved them, following the ICC’s conclusions.¹⁷⁶ The participants were state chartered railroads who, by law, could operate under their own authority only in the state where they were chartered. As a result, any freight that was shipped in one state for delivery in a different state had to be handled by two or more railroads. The freight associations addressed this problem by coordinating their scheduling so as to facilitate transfers from one railroad to another. Further, for multistate shipments the rate would have to be computed and collected either at the

¹⁷³ See discussion *supra*, text at notes ___.

¹⁷⁴ *Nat’l Soc’y of Prof’l Eng’rs v. United States*, 435 U.S. 679, 682-684, 693-94 (1978).

¹⁷⁵ *Nat’l Collegiate Athletics Assoc. v. Board of Regents*, 468 U.S. 85, 116-117 (1984).

¹⁷⁶ See *United States v. Trans-Missouri Freight Ass’n*, 58 F. 58, 78 (8th Cir. 1893) (relying on Interstate Commerce Commission Annual Report 25 (1889)), rev’d 166 U.S. 290 (1897). See also 12 ICC ANN. REP. 10-16 (1898) (approving of joint running arrangements). Accord *United States v. Joint Traffic Assn.*, 171 U.S. 505 (1898). Ruinous competition was also raised and rejected as a defense in *United States v. Addyston Pipe & Steel Co.*, 85 F. 271, 273-275, 288-289 (6th Cir. 1898), *modified*, 175 U.S. 211 (1899).

shipping point or the delivery point, and without computers.¹⁷⁷ So the agent had to make the calculations with a pencil. As the Eighth Circuit observed:

The fact that the business of railway companies is irretrievably interwoven, that they interchange cars and traffic, that they act as agents for each other in the delivery and receipt of freight and in paying and collecting freight charges, and that commodities received for transportation generally pass through the hands of several carriers, renders it of vital importance to the public that uniform rules and regulations governing railway traffic should be framed by those who have a practical acquaintance with the subject, and that they should be promulgated and faithfully observed.¹⁷⁸

To be sure, we might debate whether fixing of rates was the only workable way of addressing the rate computation problem, but that would simply make it grist for treatment under antitrust's rule of reason. Nevertheless, the Eighth Circuit's assessment of the freight associations was factually more accurate than that of the Supreme Court. Given the state of corporate law, the associations contributed greatly to the creation of an interstate railroad system.

The ruinous competition defense to price fixing has occasionally reappeared in Sherman Act price fixing cases, nearly always to be rejected.¹⁷⁹ Most recently it was rejected as a defense in the *Apple eBooks* price fixing case.¹⁸⁰ At Apple's behest, several publishers agreed with each other to impose higher resale prices for electronic books on Amazon, largely to

¹⁷⁷Then Associate Justice White (joined by Field, Gray and Shiras, jj.) observed some of these things in his dissent. *See Trans-Missouri*, 166 U.S. at 343-347. Justice White would have upheld the agreement as authorized by the Interstate Commerce Commission. *See id.* at 363-365.

¹⁷⁸*Trans-Missouri*, 78 F. at 78 (8th Cir.).

¹⁷⁹*E.g.*, *United States v. Socony-Vacuum Oil Co.*, 310 U.S. 150, 221 (1940) (rejecting ruinous competition defense to output allocation scheme); *Pennsylvania Water & Power Co. v. Consolidated Gas, Elec. Light & Power Co.*, 184 F.2d 552, 559 (4th Cir. 1950) (rejecting ruinous competition defense to output limitation agreement); *Law v. NCAA*, 185 F.R.D. 324 (D. Kan. 1999) (jury instruction rejecting ruinous competition defense in challenge to agreement of salary fixing of basketball coaches); *General Cinema Corp. v. Buena Vista Distribution Co., Inc.*, 532 F.Supp. 1244, 1258 (C.D. Cal. 1982) (rejecting ruinous competition defense to motion picture split (market division) agreement). A state court did approve a ruinous competition defense in a merger case. *See Rafferty v. Buffalo City Gas Co.*, 37 A.D. 618, 621 56 N.Y.S. 288, 290-291 (N.Y.S.Ct. App. Div. 1899) (accepting defense that a merger was necessary to prevent ruinous competition between two gas companies).

¹⁸⁰*United States v. Apple, Inc.*, 791 F.3d 290, 332 (2d Cir. 2015), *cert. denied.*, 136 S. Ct. 1376 (2016).

facilitate Apple's entry into the *ebook* market as an Amazon competitor. Like *Trans-Missouri*, the *eBooks* case illustrates the difference between a distribution restraint and a production agreement, except in this case the defendants needlessly chose a restraint on distribution, which was illegal *per se*.

Historically, book publishing and sales have never been a major source of antitrust controversy. There is a long history of resale price maintenance in distribution, very likely at the behest of smaller retailers seeking protection from larger retail chains.¹⁸¹ The industry has never had a dominant firm and is characterized by a mixture of very large and very small publishers.

Although the "ruinous competition" defense was raised in the Apple *eBooks* case,¹⁸² that decision is only superficially similar to the railroad cases, *Addyston Pipe*, or the other early ruinous competition decisions.¹⁸³ One difference between *Apple ebooks* and the earlier ruinous competition decisions is that books are subject to extreme product differentiation. As a result, consumers are not indifferent to everything except price, and pricing at above marginal cost can remain profitable even under fairly intense competition. At the same time, however, the book market was and is still going through significant changes brought about by changing technologies of book production.

Traditional book publishing is an industry characterized by some fixed costs (production plant and equipment, for example) and many variable costs, including royalties to authors, shipping, inventorying, and other distribution costs. There were also some "intermediate" costs that are more difficult to classify. For example, type-setting is a fixed cost with respect to one particular imprint of a single title. It needs to be done once whether that particular book sells ten copies or ten million. However, different titles must each be individually type set. As a result, these costs rise as a publisher sells more different titles, but not as it sells more identical copies of the same title. None of this has ever proven to be a particularly significant antitrust problem.

The rise of the *ebook* dramatically changed the cost structure of the industry – a proposition that too many critics fail to recognize. Once a title has been typeset into an electronic file, distribution costs drop to virtually zero. Ordering an *ebook* from an on-line seller means that a copy of the electronic file is sent electronically to the purchaser. No inventory is depleted. There are no carrying costs for that particular copy other than the negligible cost of electronic transmission and order processing. As a result,

¹⁸¹See Herbert Hovenkamp, *Antitrust and Information Technologies*, 68 FLA. L. REV. 419, 438 (2016).

¹⁸²*United States v. Apple*, 791 F.3d 290, 332 (2d Cir. 2015); *see also* the district court's opinion, 889 F.Supp.2d at 642.

¹⁸³*See* discussion *supra*, text at notes __.

the short-run profit maximizing price of that copy is something very close to zero, excluding royalties.

One significant variable cost item for *ebooks* that are still under copyright is authors' royalties, which typically are a stipulated percentage of net proceeds. For example, if a book produces proceeds of \$20 and the author is entitled to 15%, she will receive \$3 on that particular sale. If the publisher shifts sales to an electronic format and charges only \$10, however, then the author will receive only \$1.50 unless the contract makes special provision for electronic sales. Small wonder that authors' groups are unhappy with the *ebook* and want existing contracts renegotiated and new contracts written that will change the way authors are compensated for *ebook* sales.¹⁸⁴

The *ebook* case produced a great deal of hand wringing to the effect that the court incorrectly identified Amazon as the wrong "victim." Basically, Apple wanted to make a dramatic expansion into the *ebooks* market simultaneously with its introduction of the iPad, which it wished to market as an *ebook* reader. At the time Amazon was selling electronic books at very low prices, often \$9.99 for a book that might sell for \$30 or \$40 in traditional format, and Apple believed its entry would be unprofitable at that price point. As a result, it proposed a cartel that served the interests of everyone except consumers and Amazon – the publishers would agree with each other to impose higher resale prices on Amazon. That cartel would of course be more profitable to the publishers and also presumably to authors.

The district court and Second Circuit were correct to condemn the agreement, for several reasons. First, to permit such a cartel would constitute a precipitous reaction to a change in technology whose implications were not yet clear. Second, although ruinous competition might explain the motivation for many firms in high fixed cost industries to form cartels,¹⁸⁵ it is never the correct solution. Most importantly, the cartel price is just as "wrong" as the competitive price. Cartels, just as any other economic actors, set prices to maximize. They will not fix at the minimum price level to provide competitive returns to the industry, but rather at the monopoly price, reflecting whatever degree of market power the cartel members collectively enjoy.¹⁸⁶

Third, as noted earlier, the *ebooks* case was never a good candidate for a ruinous competition defense even if there were one. The industry is heavily

¹⁸⁴See, e.g., this statement from the Authors Guild, urging contracts calling for half of net proceeds to the author. <https://www.authorsguild.org/industry-advocacy/half-of-net-proceeds-is-the-fair-royalty-rate-for-e-books/>.

¹⁸⁵On this particular cartel, see Michael Wolfe, *The Apple E-Book Agreement and Ruinous Competition: Are E-Goods Different for Antitrust Purposes*, 12 DUKE L. & TECH. REV. 130 (2014).

¹⁸⁶See discussion *supra*, text at notes __.

product differentiated. As a result the ordinary forces of competition cannot be expected to drive prices to short run marginal cost.

The moral of the *eBooks* litigation is that the publishers should have chosen a production restraint rather than a distribution restraint. For example, rather than simply fixing *ebook* prices they could have addressed all of their problems by opening their own joint website for the distribution of electronic books, perhaps with Apple or other device manufacturers as a partner. Each publisher could have set its own prices, and customers could download them from a common website into as many file formats as they wished. Each publisher acting individually would be able to set its own download prices.¹⁸⁷

Three other important Supreme Court antitrust decisions illustrate the difference between horizontal agreements on distribution and agreements about production. In *Topco* the Supreme Court improperly characterized a clear production agreement as a price restraint.¹⁸⁸ The participants were relatively small grocery chains whose market shares averaged about six percent in the territories in which they operated.¹⁸⁹ Under the agreement they jointly developed the “Topco” brand, built warehouses and other distribution facilities, all in an effort to compete more effectively with larger, wholly owned chain stores. As part of this agreement each member received an exclusive assigned territory for the sale of Topco brands, although it was free to sell goods not bearing the Topco label anywhere it wished.

Without any serious economic analysis, the majority held that the agreement was unlawful *per se* because it limited the members’ ability to compete with each other. The fact is that the Topco venture was doing exactly what any value maximizing single entity would have done. For example, Wal-Mart would not build three stores in the same block. Rather it would seek optimal dispersion so that the stores could compete more effectively with competitors and would not end up cannibalizing one another. The Topco defendants were not fixing prices – they lacked the power to do so. Rather, they were developing a common brand – in the process innovating a new production mechanism that, if successful, would result in more effective competition with larger rivals.

The *Broadcast Music (BMI)* decision, which involved digital rights, was

¹⁸⁷Since 2007 resale price maintenance has been governed by the rule of reason and is presumably lawful for nondominant firms. See *Leegin Creative Leather Products, Inc. v. PSKS, Inc.*, 551 U.S. 877 (2007). In any event, however, a price restraint on an IP license was never unlawful *per se* to begin with because there is no qualifying “resale.” See PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶1621-1622 (4th ed. 2017).

¹⁸⁸*United States v. Topco Assocs., Inc.*, 405 U.S. 596 (1972).

¹⁸⁹*Id.* at 599 (noting that the members’ market shares ranged from 1.5% to 16%, with an average of about 6%).

an antitrust challenge to a production arrangement whose social benefits today seem beyond question.¹⁹⁰ BMI and its fellow association ASCAP were associations made up of thousands of composers, publishers and others who owned the copyrights (performance rights) to recorded music. Today BMI has approximately 750000 members,¹⁹¹ and ASCAP (American Society of Composers, Authors, and Publishers) has around 625000 members.¹⁹²

BMI and ASCAP issued a “blanket license” in order to confront a problem that had arisen in the recorded music industry – namely, how to license music broadcasting rights to radio stations, television stations, and others in situations where the volumes of songs to be licensed was both very high and “on demand,” in the sense that the right had to be granted on very short notice. A system in which each radio station programmer or disc jockey negotiated individually for each piece to be played on a radio station would make music channels as we know them today impossible.

The BMI and ASCAP blanket licenses consist of tens of thousands of recorded musical performances for which participating artists and other copyright holders have previously granted a nonexclusive license. These licenses are then packaged into a “blanket license” which is sold to individual licensees such as radio stations, at a price which varies with their revenue. The license gives the licensee immediate, indemnified access to any song in the library. For example, the disk jockey who is requested to play a particular song will either know from memory whether it is in the blanket license or else be able to look it up very quickly on a digital directory. At that point he or she need do nothing further to complete any “transaction.” If the station owns the CD or the recording in some other form, it can be played on the air.

The Supreme Court decision approving the blanket license assumed that its composition was a form of horizontal price fixing. That characterization seems doubtful. There is nothing to suggest that the tens of thousands of artists were negotiating with each other about license fees. Rather, they dealt individually with the administrators of the blanket license. That is, this was not a horizontal agreement but rather a series of vertical agreements. It is more equivalent to Whole Foods’ announcement that it is willing to pay 50 cents per pound for organic potatoes. If 10 growers deliver potatoes at that price, it does not suggest horizontal price fixing but rather a series of vertical agreements that all end up at the same price because there is a common buyer.

The BMI blanket license was a production agreement, not a price agreement. In fact, in this case it produced a product that was very much different from any product that each individual artist was capable of purchasing alone. The fact that the artists numbered in the thousands and that

¹⁹⁰Broadcast Music, Inc. v. Columbia Broadcasting Sys., Inc., 441 U.S. 1 (1979).

¹⁹¹See <https://www.BMI.com>.

¹⁹²See <https://www.ascap.com/about-us>.

the individual licenses were nonexclusive meant that price fixing was impossible. If prices ever rose above the individual license level any artist would be permitted to make unlimited individual sales. No cartel can survive except by reducing output, and a nonexclusive agreement among a large number of participants does not permit an output reduction.

The Supreme Court's *Maricopa* decision three years later deserved similar treatment but did not receive it.¹⁹³ The defendants were about 1750 physicians practicing in diverse areas, who made up about 70% of the practicing physicians in Maricopa County.¹⁹⁴ They entered a nonexclusive agreement¹⁹⁵ stipulating the maximum fees that they would charge for listed medical procedures. This information was compiled for employers to select as a health coverage option. Under the Maricopa Plan an insured who selected a Plan member would be guaranteed the rate named in the Plan agreement. If the insured went to a nonmember reimbursement would be paid at the agreed-upon rate but the insured would have to pay any excess.¹⁹⁶

The Court struck the agreement down as per se maximum price fixing.¹⁹⁷ In his dissent, Justice Powell protested that the Court had acted on too thin a record.¹⁹⁸ More likely, however, the problem was definitional. The majority was hung up by the fact that what the physicians did was "price fixing," but without asking whether this was a production agreement or a distribution restraint. Clearly it was the former. As in *BMI*, a nonexclusive arrangement among 1750 cartel members would never have been able to pull off the kind of output reduction that collusion requires.

Rather, this aggregation of physicians was devising an insurance plan that differs from most plans today in that it left more risk with the insured: they were guaranteed a fee-for-service price but still had to decide how much and what kind of care to purchase. As a result of *Maricopa*, the government to this day distinguishes the antitrust legality of insurance plans depending on the degree of physician or insurer risk they contemplate.¹⁹⁹ Plans are thought

¹⁹³Arizona v. Maricopa County Medical Soc., 457 U.S. 332 (1982).

¹⁹⁴*Id.* at 339.

¹⁹⁵*See id.* at 359 (Powell, J., dissenting, joined by Chief Justice Burger and Justice Rehnquist) ("physicians who participate in the foundation plan are free both to associate with other medical insurance plans—at any fee level, high or low—and directly to serve uninsured patients....").

¹⁹⁶*Id.* at 340.

¹⁹⁷*Id.* at 348. For good commentary, see Frank H. Easterbrook, *Maximum Price Fixing*, 48 U. CHI. L. REV. 886 (1981). See also 12 HERBERT HOVENKAMP, *ANTITRUST LAW* ¶2007 (3d ed. 2012).

¹⁹⁸*Maricopa*, 457 U.S. at 357-358 (Powell, j., dissenting).

¹⁹⁹*See* Department of Justice and Federal Trade Commission, *Statements of Antitrust Enforcement Policy in Health Care*, Introduction, Statement 8 (1993),

to be lawful under the antitrust laws if they take an expected value approach to prices, such as 85% of anticipated medical needs, rather than a straight up fee for service approach.

The debate over how much risk should be borne by insurers and how much by insureds is an important one, but it is not an *antitrust* debate unless the challenged agreement is simply a cover for price fixing. Even risk-bearing plans incorporate considerable diversity about risk assumption. For example, one might offer 100% coverage of a certain procedure while another might offer only 50%, or perhaps require a copay and then pay 80% of the balance. These should not be decisions with antitrust significance. Antitrust has done its job when it has concluded that the agreement at issue is one of production design rather than distribution. At that point the insurance industry can decide about the plant's merits as an insurance product.

V. Conclusion

An antitrust policy driven by concerns for consumer welfare should favor design and production initiatives but disfavor restraints on pricing. Indeed, it is more important for antitrust policy to get the innovation question right than to be right on price. Innovation has the potential to affect economic development much more dramatically, and in both directions. That is, just as innovation benefits the economy by a greater amount than price competition under constant technology, so too a restraint on innovation can do greater harm.²⁰⁰

So antitrust policy makers must be able to distinguish practices primarily affecting innovation or production design from those that principally affect price. This obligates defendants to articulate their defenses carefully. If an antitrust defense acknowledges that the profitability of a restraint depends on the defendants' ability to increase price or reduce output, then they have all but admitted that theirs is a naked restraint about price. That is why the defense in the *Apple eBooks* case could not succeed. The defendants effectively admitted to a cartel-imposed price increase because they believed that Amazon's prices were too low.²⁰¹

To answer the question posed at the beginning of this article, antitrust policy should be more concerned with restraints on distribution, but distribution must be properly defined. By focusing so much on price, antitrust policy has often missed the point of some arrangements, particularly those that involve new technologies or innovations in organization. In the

available at <https://www.justice.gov/atr/statements-antitrust-enforcement-policy-health-care>.

²⁰⁰See discussion *supra*, text at notes __.

²⁰¹See discussion *supra*, text at notes __.

process, it has confused innovation with monopoly. For example, antitrust's long war with tying arrangements occurred because litigants and courts were obsessed with pricing and either never queried or else did not appreciate how tying relates to innovation and production. By their nature, innovations upset a market's equilibrium, producing temporarily higher returns. As a result, a common feature of innovation is short-run prices that are above cost and welfare reducing to the myopic eye. These are essential features of innovation-intensive markets, however, and in such cases the social cost of false condemnation is high.