

TYING LAW FOR THE DIGITAL AGE

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Tying arrangements, a central concern of antitrust policy since the early days of the Sherman and Clayton Acts, have come into renewed focus with respect to the practices of dominant technology companies. Unfortunately, tying law's doctrinal structure is a self-contradictory and incoherent wreck. A conventional view holds that this mess is due to errant Supreme Court precedents, never fully corrected, that expressed hostility to tying based on faulty economic understanding. That is only part of the story. Examination of tying law's origins and development shows that tying doctrine was built on a now-dated paradigm of what constitutes a tying arrangement. In its origins during the industrial age, tying meant the leverage of patent rights over one good to impose requirements contracts forcing the purchase of a second, unpatented good. That paradigm no longer describes the vast majority of tying arrangements challenged under the antitrust laws. Instead, digital-age tying claims tend to involve product design decisions, the integration of technologies, the bundling of components, considerations of product functionality and performance, and the economic terms on which companies can obtain a return on their research and development investments. Correcting the mess in tying law requires not only updating economic learning, but also appreciating the patterns of behavior to which tying standards are applied.

INTRODUCTION

No competition law subject has more preoccupied the Supreme Court than tying. Since its origins in patent law, tying has come to the Court on at least twenty-two occasions, perhaps more than other significant areas of antitrust policy like predatory pricing, exclusive

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dealing, mergers, or cartels.¹ Courts and scholars conventionally divide tying law into two eras.² In the first era, which ran from the early twentieth century until the Chicago School revolution of the 1970s, the courts viewed tying arrangements with inherent suspicion, encapsulated in the Supreme Court's 1949 dictum that "[t]ying agreements serve hardly any purpose beyond the suppression of competition."³ In the second era, starting with *U.S. Steel Corp. v. Fortner Enterprises, Inc. (Fortner II)* in 1977, the Court began to regard tying arrangements with greater receptivity, culminating in the Court's express retraction of the "hardly any purpose" maxim in 2006.⁴ Thus, today courts no longer approach tying arrangements with the old hostility and many commentators believe that most tying arrangements are procompetitive.⁵

1 *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 31 (2006); *Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451, 459 (1992); *Town of Hallie v. City of Eau Claire*, 471 U.S. 34, 37 (1985); *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 8 (1984); *City of Lafayette v. La. Power & Light Co.*, 435 U.S. 389, 404 (1978), *superseded by statute*, Local Government Antitrust Act of 1984, Pub. L. No. 98-544, §§ 2-4, 98 Stat. 2750, 2750 (codified at 15 U.S.C. §§ 34-36 (2018)); *U.S. Steel Corp. v. Fortner Enters., Inc. (Fortner II)*, 429 U.S. 610, 611 (1977); *Fortner Enters., Inc. v. U.S. Steel Corp. (Fortner I)*, 394 U.S. 495, 497 (1969); *United States v. Loew's Inc.*, 371 U.S. 38, 39 (1962); *N. Pac. Ry. Co. v. United States*, 356 U.S. 1, 5 (1958); *Black v. Magnolia Liquor Co.*, 355 U.S. 24, 25 (1957); *Times-Picayune Publ'g Co. v. United States*, 345 U.S. 594, 601 (1953); *Standard Oil Co. of Calif. v. United States (Standard Stations)*, 337 U.S. 293, 305 (1949); *United States v. Paramount Pictures, Inc.*, 334 U.S. 131, 158 (1948); *Int'l Salt Co. v. United States*, 332 U.S. 392, 394 (1947), *abrogated by Indep. Ink*, 547 U.S. 28; *Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661, 666 (1944), *superseded by statute*, Bryson Act, Pub. L. No. 593, § 1, 66 Stat. 792, 811 (codified in relevant part as amended at 35 U.S.C. § 271 (2018)); *Pick Mfg. Co. v. Gen. Motors Corp.*, 299 U.S. 3, 3 (1936); *Int'l Bus. Machs. Corp. v. United States*, 298 U.S. 131, 135-36 (1936); *FTC v. Sinclair Refin. Co.*, 261 U.S. 463, 473 (1923); *United Shoe Mach. Corp. v. United States (United Shoe II)*, 258 U.S. 451, 457 (1922); *United States v. United Shoe Mach. Co. of N.J. (United Shoe I)*, 247 U.S. 32, 58 (1918); *Motion Picture Pats. Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 506 (1917); *Henry v. A.B. Dick Co.*, 224 U.S. 1, 13 (1912), *overruled by Motion Picture Pats.*, 243 U.S. 502.

2 See, e.g., Alan J. Meese, *Tying Meets the New Institutional Economics: Farewell to the Chimera of Forcing*, 146 U. PA. L. REV. 1, 3 (1997) (discussing shift in Supreme Court view on tying from "extreme approaches" in past to middle ground today); Daniel A. Crane, *Antitrust Antitextualism*, 96 NOTRE DAME L. REV. 1205, 1232 (2021) (discussing shift in Supreme Court view of tying from period of hostility to period of greater receptivity).

3 *Standard Stations*, 337 U.S. at 305-06.

4 *Indep. Ink*, 547 U.S. at 36 ("The assumption that '[t]ying arrangements serve hardly any purpose beyond the suppression of competition,' rejected in *Fortner II*, has not been endorsed in any opinion since." (quoting *Standard Stations*, 337 U.S. at 305-06)); *Fortner II*, 429 U.S. 610.

5 HERBERT HOVENKAMP, MARK D. JANIS, MARK A. LEMLEY & CHRISTOPHER R. LESLIE, *1 IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW* § 21.2c, at 21-12.1 (2d ed. Supp. 2011); Frank H. Easterbrook, *Intellectual Property Is Still Property*, 13 HARV. J.L. & PUB. POL'Y 108, 112 (1990) (describing this form of price discrimination through tying as achieving "the best of both worlds").

The conventional story is only superficially correct. To be sure, the Supreme Court has changed its tune on tying. But it has not yet explicitly retracted the doctrinal foundation of the old hostility—the rule of per se illegality for “certain” tying arrangements. To the contrary, on the last occasion when the Court expressly considered whether to retain the per se rule, the majority declared that “[i]t is far too late in the history of our antitrust jurisprudence to question the proposition that certain tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable ‘*per se*.’”⁶ Although there never really was a per se rule for tying akin to the per se rule for price fixing and some lower courts have more or less abandoned the pretense of a lingering per se rule for tying in light of recent doctrinal developments,⁷ the Supreme Court’s refusal to clear the doctrinal underbrush has left the lower courts in a state somewhere between bemusement and befuddlement.⁸ The American Bar Association’s antitrust model jury instructions effectively throw up their hands and offer both a per se and rule of reason instruction without any advice on which to apply.⁹ And the morass is not limited to the question of per se illegality. Up and down its doctrinal scaffolding, tying law is a wreck. Among many other things, courts cannot seem to keep straight whether the requirement that the tying arrangement affect a “not insubstantial volume of commerce” is simply a vestigial jurisdictional element from elder days when Congress’s Commerce Clause powers faced genuine limits, or a substantive and economically important element concerning substantial foreclosure in the tied market.¹⁰ They apply a “force” or “coercion” standard that can mean

6 *Jefferson Par.*, 466 U.S. at 9.

7 *E.g.*, *Viamedia, Inc. v. Comcast Corp.*, 951 F.3d 429, 468 (7th Cir. 2020) (stating that the per se rule for tying is “nominal[]” and “peculiar” and requires proof of “much of what must be demonstrated in a rule of reason case”); *Apple Inc. v. Psystar Corp.*, 586 F. Supp. 2d 1190, 1198 n.3 (N.D. Cal. 2008) (stating that Supreme Court has overruled the per se rule).

8 *See, e.g.*, *Jefferson Par.*, 466 U.S. at 34–35 (O’Connor, J., concurring in judgment) (“[T]he *per se* label in the tying context has generated more confusion than coherent law . . .”); *Smith Mach. Co. v. Hesston Corp.*, No. CIV-82-1299, 1987 WL 14498, at *5 n.5 (D.N.M. Mar. 26, 1987) (observing that “considerable confusion” has developed over the Supreme Court’s tying jurisprudence), *aff’d*, 878 F.2d 1290 (10th Cir. 1989).

9 *See* SECTION OF ANTITRUST L., AM. BAR ASS’N, MODEL JURY INSTRUCTIONS IN CIVIL ANTITRUST CASES chs. 2.E.3, 2.E.4 (2016).

10 *See* Christopher R. Leslie, *The Commerce Requirement in Tying Law*, 100 IOWA L. REV. 2135, 2151 (2015) (quoting *Cascade Health Sols. v. PeaceHealth*, 515 F.3d 883, 913 (9th Cir. 2008)); *id.* at 2137 (“Depending on how the commerce element is articulated, it serves either a substantive or a jurisdictional function, or both. However, courts are neither particularly clear nor consistent in how they are using the element. This ambiguity makes the element difficult to understand and apply.”).

wildly different things.¹¹ And they are divided over whether tying liability depends on the defendant having an “economic interest” in the tied product.¹²

It is time for a thorough housecleaning on tying law, but the problem lies not simply in doctrinal confusion. Nor does it lie simply in contested economic theories. Although economic theories about tying are abundant and contested, there is a more fundamental problem. Tying law as we know it was built for the industrial age. To be more precise, it was built to address a set of industrial-era problems about the exploitation of intellectual property rights to leverage power to adjacent markets through contractual requirements clauses. Such problems have not vanished in the digital age, but they are no longer characteristic of most tying claims. Rather, the set of problems to which tying law is applied today is markedly different from the set of problems on which tying law was built. Most tying claims today do not involve requirements contracts. They involve the ways in which products or services are built and sold. That is to say, they involve product design decisions, the integration of technologies, the bundling of components, considerations of product functionality and performance, and the economic terms on which companies can obtain a return on their research and development investments.

It is tempting to refer to the digital age problems as ones of “technological tying,” as some commentators have done.¹³ But “technological tying” only captures a subset of the relevant problems. Two products are “technologically tied” when they are designed to be compatible to the exclusion of competitive complements, but many tying challenges involve forms of product integration that do not involve compatibility limitations. They may involve pure bundling (the integration of two components into a single unit sold at a single price) or mixed bundling (offering a discount on the purchase of a package of separate products).¹⁴ They may also involve “softer” forms of coercion to buy potentially separate products, such as the supplier’s implicit threat to stop supplying the tying product, or to supply it on inferior

11 10 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION* ¶ 1752e (4th ed. 2018).

12 See, e.g., *Wholesale All., LLC v. Express Scripts, Inc.*, 366 F. Supp. 3d 1069, 1080, 1080–81 (E.D. Mo. 2019) (collecting cases), *appeal dismissed*, No. 19-2176, 2019 WL 6711792 (8th Cir. June 19, 2019).

13 E.g., Einer Elhauge, *Tying, Bundled Discounts, and the Death of the Single Monopoly Profit Theory*, 123 HARV. L. REV. 397, 447 (2009); Nicholas Economides & Ioannis Lianos, *The Elusive Antitrust Standard on Bundling in Europe and in the United States in the Aftermath of the Microsoft Cases*, 76 ANTITRUST L.J. 483, 519 (2009); Keith N. Hylton & Michael Salinger, *Tying Law and Policy: A Decision-Theoretic Approach*, 69 ANTITRUST L.J. 469, 472–73 (2001).

14 DENNIS W. CARLTON & JEFFREY M. PERLOFF, *MODERN INDUSTRIAL ORGANIZATION* 324 (4th ed. 2005).

terms, if the customer purchases the tied product from a rival. In short, the forms of business arrangement predominantly challenged in contemporary tying cases often bear scanty resemblance to the business paradigms on which tying law was built.

This Article argues that it is past time to develop a tying law for the digital age. Doing this would require more than fixing the doctrinal mess that developed from the shift in judicial attitudes toward tying. It requires starting close to *tabula rasa* by identifying the business phenomena to which tying claims are addressed, understanding their competitive threats and potential social benefits, and constructing a coherent set of legal principles to manage adjudication of tying disputes. I say “close to *tabula rasa*” because categories and components of existing tying law can still do work in the new doctrinal paradigm. But it won’t do to start with tying law as it is and try to make some adjustments at the margin. The doctrine needs to be rebuilt from the ground up.

The remainder of this Article proceeds as follows. Part I maps the construction of tying law in the industrial age. It shows that tying law, both statutory and case law, grew out of a concern that owners of patents and copyrights could leverage their limited statutory grant of a legal monopoly to obtain a second monopoly over another product not covered by intellectual property rights (or by weaker ones). The core concern was with contracts requiring the purchase of future requirements of the tied product, and it was to those contracts that the rule of per se illegality was addressed. As economic theory about tying contracts evolved, the courts began to express less hostility to the requirements-contract form of tying, but neither articulated a new and coherent doctrinal structure nor appreciated the extent to which tying claims were being addressed to new forms of business and technological arrangements. The result is a doctrinal and conceptual morass. Part II situates tying claims in the digital age. It first traces the development of tying theories using a case study from computer software and hardware. It then surveys the body of recent tying challenges and shows that few resemble the business paradigms on which tying law was built. Rather than involving contractual obligations to purchase the tied product in the future, they tend to involve technological design decisions and control over information flows. Finally, Part III suggests workable tying rules for the digital age. Although the headings of these rules resemble some of the doctrinal headings currently employed in tying analysis, the suggested analysis would require a fresh start on tying law for the digital age.

I. TYING LAW IN THE INDUSTRIAL AGE

A. *Patent Law Foundations*

Tying law originated in patent law during the Second Industrial Revolution when the patenting of commercial products and processes was soaring. The U.S. government issued fewer than 10,000 patents prior to 1836, one million patents by 1911 (with the majority being issued in the last decade of the nineteenth century and first decade of the twentieth), and another million patents by 1935.¹⁵ During this turn-of-the-century period of patent explosion, tying law was born. The courts “first encountered ties in the course of defining various issues concerning patent infringement or the proper scope of a patent.”¹⁶ Patentees would license their patented invention on the condition that only their approved materials or supplies could be used with the machine, and then sued for patent infringement if users employed competitors’ materials.¹⁷ For example, in an early Sixth Circuit decision, the patentee sold patented button-fastening machines bearing labels stating that the fastener could only be used with staples purchased from the patentee.¹⁸ The Sixth Circuit upheld a contributory infringement claim against a company that sold staples to users of the plaintiff’s machines.¹⁹ Over the next several decades, lower courts routinely found contributory infringement in similar cases.²⁰

15 See *Milestones in U.S. Patenting*, U.S. PAT. & TRADEMARK OFF. (Sept. 26, 2023, 10:11 AM), <https://www.uspto.gov/patents/milestones> [<https://perma.cc/2ZE3-L96H>].

16 9 AREEDA & HOVENKAMP, *supra* note 11, ¶ 1701a (“The historical development of antitrust tying doctrine is closely related to patent policy. Indeed, tying was the locus of the first great debate about the proper accommodation of antitrust to patent policy, and vice versa.” *Id.* ¶ 1701.).

17 *Id.*

18 *Heaton-Peninsular Button-Fastener Co. v. Eureka Specialty Co.*, 77 F. 288, 290 (6th Cir. 1896), *overruled by* *Motion Picture Pats. Co. v. Universal Film Mfg. Co.*, 243 U.S. 502 (1917).

19 *Id.* at 301.

20 See, e.g., *Aeolian Co. v. Harry H. Juelg Co.*, 155 F. 119, 119–20 (2d Cir. 1907) (*per curiam*) (finding liability for music rolls to be used with patented player piano); *Crown Cork & Seal Co. of Balt. City v. Brooklyn Bottle Stopper Co.*, 172 F. 225, 226, 233 (C.C.E.D.N.Y. 1909) (finding liability for sale of bottle caps to be used with patented bottle-handling machines), *aff'd as modified*, 200 F. 592 (2d Cir. 1912); *Cortelyou v. Charles Eneu Johnson & Co.*, 138 F. 110, 122–23 (C.C.S.D.N.Y. 1905) (finding liability for sale of ink to be used with patented copying machines), *rev'd*, 145 F. 933 (2d Cir. 1906), *aff'd*, 207 U.S. 196 (1907); *Brodrick Copygraph Co. of N.J. v. Roper*, 124 F. 1019, 1019 (C.C.D.R.I. 1903) (finding liability for sale of ink to be used with patented copying machines); *Tubular Rivet & Stud Co. v. O'Brien*, 93 F. 200, 200, 206 (C.C.D. Mass. 1898) (finding liability for sale of unpatented rivets to be used with riveting machine and unpatented rivets).

The Supreme Court concurred in its first tying case, decided in 1912, the year after the U.S. government issued its millionth patent.²¹ In *Henry v. A.B. Dick Co.*,²² the plaintiff sold a patented stencil-duplicating machine subject to “the license restriction that it may be used only with the stencil paper, ink and other supplies made by A. B. Dick Company.”²³ In a decision by Justice Lurton, who had authored the *Heaton Peninsula* case while sitting on the Sixth Circuit, the Supreme Court found that the defendant’s sale of ink for use in the plaintiff’s machines constituted contributory infringement because the patent statute did not limit the patentee’s rights to impose conditions on the use of its products.²⁴ The Court did not analyze antitrust principles, which were not raised in the case. However, Chief Justice White wrote a dissenting opinion joined by Justices Hughes and Lamar, expressing a concern that the majority’s approach would permit such “evils” as a patentee’s requiring that lumber from trees grown on a particular person’s land or sawed by a particular mill be used with its patented carpenter’s plane.²⁵

A.B. Dick landed in the midst of the 1912 presidential election that saw antitrust emerge as a leading issue and set the stage for the two antitrust reform statutes of 1914: the Federal Trade Commission Act and the Clayton Act.²⁶ Shortly before *A.B. Dick* was decided, in December of 1911, the Justice Department brought an antitrust action against United Shoe Machinery Company for its policy of only leasing its patented shoe machinery on the condition that the lessee not use the equipment to make shoes on which other work had been performed by a machine not leased from United Shoe.²⁷ During the 1914 congressional hearings that would ultimately lead to the passage of section 3 of the Clayton Act, which prohibited anticompetitive tying arrangements,²⁸ members of Congress targeted *A.B. Dick* as the paradigm of

21 *Milestones in U.S. Patenting*, *supra* note 15.

22 224 U.S. 1 (1912), *overruled by* Motion Picture Pats. Co. v. Universal Film Mfg. Co., 243 U.S. 502 (1917).

23 *Id.* at 11.

24 *Id.* at 48–49.

25 *Id.* at 50, 55 (White, C.J., dissenting).

26 Clayton Act, ch. 323, 38 Stat. 730 (1914) (codified as amended in scattered sections of 15, 18, and 29 U.S.C.); Federal Trade Commission Act, ch. 311, 38 Stat. 717 (1914) (codified as amended at 15 U.S.C. §§ 41–51 (2018)); see Daniel A. Crane, *All I Really Need to Know About Antitrust I Learned in 1912*, 100 IOWA L. REV. 2025, 2027–28 (2015); Victor H. Kramer, *The Supreme Court and Tying Arrangements: Antitrust as History*, 69 MINN. L. REV. 1013, 1019–20 (1985).

27 THE FEDERAL ANTITRUST LAWS: WITH SUMMARY OF CASES INSTITUTED BY THE UNITED STATES, 1890–1951, at 92 (1952) (case 101).

28 Clayton Act § 3 (prohibiting tying arrangements sales or leases conditioned on the “agreement or understanding that the lessee or purchaser thereof shall not use or deal in the goods, wares, merchandise, machinery, supplies or other commodities of a competitor

anticompetitive tying that would “deprive the purchasing public of the advantages of . . . free use” of patented articles.²⁹ Louis Brandeis, who “had had an intimate involvement with the shoe machinery trust from 1899 through January 1907, serving as an incorporator, attorney, and director of the United Shoe Machinery Co. and the United Shoe Machinery Corp.,” testified about United Shoe’s “use of certain tying clauses in its equipment leases” and “constructed an irresistible case for the inclusion of anti-tying provisions in the legislation that ultimately became the Clayton Act.”³⁰ United Shoe submitted twenty-two copies of its form leases into the congressional record, and these were considered “so important to the enactment of section 3 of the Clayton Act.”³¹ The Congress that enacted the Clayton Act thought of tying as the practice of using *a contract* to force an unwilling customer to buy its future requirements from the supplier.³²

Responding to the will of Congress, the Supreme Court promptly reversed course on tying clauses. In *Motion Picture Patents Co. v. Universal Film Manufacturing Co.*, the Court invalidated a contractual clause prohibiting purchasers from using the plaintiff’s film projectors to display any films other than those of the patentee’s affiliates.³³ The clause was analytically indistinguishable from the one upheld in *A.B. Dick*, but now section 3 of the Clayton Act intervened.

Motion Picture Patents involved antitrust only as a foil to the patentee’s infringement action, but soon antitrust would be deployed affirmatively to invalidate contractual tying clauses. It took two visits to the Supreme Court for the hammer to come down on United Shoe.

or competitors of the lessor or seller, where the effect of such lease, sale, or contract for sale or such condition, agreement or understanding may be to substantially lessen competition or tend to create a monopoly in any line of commerce.”).

29 See 51 CONG. REC. 14091–92 (1914) (statement of Sen. Reed); see also H.R. REP. NO. 63-627, at 13 (1914), reprinted in 2 THE LEGISLATIVE HISTORY OF THE FEDERAL ANTITRUST LAWS AND RELATED STATUTES 1089, 1094 (Earl W. Kintner ed., 1978); 51 CONG. REC. 15990–91 (1914) (statement of Sen. Weeks); *id.* at 14096–97 (statement of Sen. Reed); *id.* at 9408 (statement of Rep. Webb).

30 2 THE LEGISLATIVE HISTORY OF THE FEDERAL ANTITRUST LAWS AND RELATED STATUTES, *supra* note 29, at 994.

31 *Id.* at 1000.

32 See 51 CONG. REC. 14274 (1914) (statement of Sen. Newlands) (“Mr. President, this paragraph relates to tying contracts.”); *id.* at 16273 (statement of Rep. Webb) (stating legislation denounces as unlawful “the tying contract”); H.R. REP. NO. 63-627, at 11 (stating, in Representative Clayton (bill sponsor)’s analysis, bill “prohibits the exclusive or ‘tying’ contract made between the manufacturer and the dealer by purchase or lease, whereby the latter agrees, as a condition of his contract, not to use or deal in the commodities of the competitor or rival of the seller or lessor”); *id.* at 13 (“[T]he exclusive or ‘tying’ contract made with local dealers becomes one of the greatest agencies and instrumentalities of monopoly ever devised by the brain of man.”).

33 243 U.S. 502, 518 (1917).

In the first case, decided in 1918, the Court rejected the government's challenge to United Shoe's lease restrictions, unpersuasively distinguishing *Motion Picture Patents* as a case involving a sale rather than a lease.³⁴ *United States v. United Shoe Machinery Co. of New Jersey (United Shoe I)* was decided under the Sherman Act since the Clayton Act had not yet been enacted when the government brought the case, but the government got another bite at the apple with its essentially identical case filed under section 3 of the Clayton Act in 1915 and decided by the Supreme Court in 1922.³⁵ This time, the Court found the tying arrangement illegal based on United Shoe's "dominating position in supplying shoe machinery of the classes involved" and the effect of "these covenants signed by the lessee and binding upon him" which "effectually prevent him from acquiring the machinery of a competitor of the lessor except at the risk of forfeiting the right to use the machines furnished by the United Company which may be absolutely essential to the prosecution and success of his business."³⁶

United Shoe Machinery Corp. v. United States (United Shoe II) marked the full domestication of tying principles in antitrust law, and from there on out, the pattern was set. The prohibited pattern—the meaning of "tying"—involved a "covenant" by the purchaser or lessee only to fill her future requirements of a complementary product from the seller or his affiliates. The first sweep of cases, represented by *A.B. Dick, Motion Picture Patents*, and *United Shoe*, involved the leveraging of patents to impose requirements covenants. The Supreme Court found liability in similar cases involving IBM's requirement that lessees of its tabulating machines purchase all of their punch card requirements from IBM³⁷ and International Salt's requirement that lessees of its salt-injection machines purchase their salt requirements from International Salt.³⁸ Conversely, in *FTC v. Sinclair Refining Co.*³⁹ and *Pick Manufacturing Co. v. General Motors Corp.*,⁴⁰ the Court rejected tying liability in circumstances not involving the leveraging of patent rights. Eventually, the Court added copyrights to the prohibition on leveraging IP

34 *United Shoe I*, 247 U.S. 32, 58 (1918).

35 *United Shoe II*, 258 U.S. 451, 454–55 (1922).

36 *Id.* at 458, 457–58.

37 *Int'l Bus. Machs. Corp. v. United States*, 298 U.S. 131, 135–36 (1936).

38 *Int'l Salt Co. v. United States*, 332 U.S. 392, 395–96 (1947), *abrogated by* *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28 (2006).

39 261 U.S. 463, 464–65, 474–75 (1923) (rejecting FTC challenge to the policy of thirty gasoline refiners and wholesalers only to lease underground tanks with pumps on the condition that the tanks only be filled with gasoline supplied by the lessor).

40 299 U.S. 3, 3–4 (1936) (rejecting challenge to General Motors' policy of requiring GM dealers to agree only to use GM parts for repairing GM vehicles).

rights, invalidating the block booking of movies in *United States v. Paramount Pictures, Inc.*⁴¹ and *United States v. Loew's Inc.*⁴²

In sum, tying law grew out of a particular business paradigm during the period of industrialization and explosive growth of patent and copyright propertization in the late nineteenth and early twentieth centuries. That paradigm involved the use of a patent or copyright over a primary product to force customers to agree in a sales or lease contract to purchase their future requirements of a secondary product or supply from the seller or its affiliates. It was to that contract that the rule of per se illegality, discussed next, was addressed.

B. Development of the “Per Se Rule”

The Supreme Court first stated the principle that tying arrangements may be illegal per se in *International Salt Co. v. United States*, a case that, as noted, involved the industrial-age paradigm of the lease of a patented machine attendant with a mandatory contractual clause requiring the lessee to purchase its future requirements from the lessor.⁴³ Drawing on the well-established principle that horizontal price fixing is “unreasonable, per se,” Justice Jackson found it also “unreasonable, per se, to foreclose competitors from any substantial market.”⁴⁴ In *Times-Picayune Publishing Co. v. United States*, a case not involving the industrial-age pattern and where the Court upheld the alleged tying arrangement, the Court followed up on *International Salt* and articulated the “perceptible pattern of illegality” emerging from tying cases:⁴⁵

When the seller enjoys a monopolistic position in the market for the “tying” product, or if a substantial volume of commerce in the “tied” product is restrained, a tying arrangement violates the narrower standards expressed in § 3 of the Clayton Act because from either factor the requisite potential lessening of competition is inferred. And because for even a lawful monopolist it is “unreasonable, per se, to foreclose competitors from any substantial market,” a tying arrangement is banned by § 1 of the Sherman Act whenever both conditions are met.⁴⁶

Despite Justice Jackson’s suggestion in *International Salt* that this ostensible per se rule flowed naturally from the rule of per se illegality for horizontal price fixing, on its face the per se rule articulated in

41 334 U.S. 131, 157–58 (1948).

42 371 U.S. 38, 39 (1962).

43 332 U.S. at 393.

44 *Id.* at 396.

45 345 U.S. 594, 608 (1953).

46 *Id.* at 608–09 (emphasis omitted).

Times-Picayune was a very different kettle of fish from the one applicable to price fixing. The per se rule applicable to price fixing is a form-based prohibition: the very form of the agreement among competitors not to compete establishes its legality, without any inquiry into the economic facts surrounding the agreement.⁴⁷ Thus, a relevant market, market power, and anticompetitive effects need not be proved in a price fixing case.⁴⁸ But to determine whether the seller “enjoys a monopolistic position” in the tying market or has restrained “a substantial volume of commerce” in the tied market requires just those sorts of inquiries.⁴⁹ There is no sense in talking about a tying or tied market unless a market has been properly defined.⁵⁰ One cannot assess whether the accused party has a “monopolistic position” without assessing its market power. And proving that a “substantial volume of commerce” has been “restrained” facially involves some inquiry into the effects of a tying arrangement of the sort that the per se rule—that is to say, the genuine per se rule applicable to price fixing—is supposed to eliminate. The only additional element of full rule of reason analysis—inquiry into potential procompetitive justifications—was not explicitly acknowledged in *Times-Picayune*, but it was at issue in *International Salt*, where the Court considered and rejected—on the merits,

47 See *United States v. Socony-Vacuum Oil Co.*, 310 U.S. 150, 224 n.59 (1940).

48 See *id.* (recognizing that neither power to raise prices, nor evidence that prices were actually raised, is necessary to establish the illegality of price fixing); see also *Ohio v. Am. Express Co.*, 138 S. Ct. 2274, 2283–84 (2018) (explaining that assessments of market definition, market power, and anticompetitive effects are elements of rule of reason, but not per se, cases).

49 *Times-Picayune*, 345 U.S. at 608, 608–609.

50 Some courts have suggested that it is not necessary to define a relevant market in a tying case if the plaintiff proceeds on a per se theory. See, e.g., *Datel Holdings Ltd. v. Microsoft Corp.*, 712 F. Supp. 2d 974, 998–99 (N.D. Cal. 2010) (holding that “it is not necessary to rigorously define a market for the product” in a per se tying case, *id.* at 998). Most courts require ordinary market definition to support a tying claim. But the ostensible trigger for applying the per se rule is a “high” market share or the seller’s control over a unique product that its competitors cannot offer. *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 17 (1984). It’s impossible to know whether the seller’s market share is “high” without knowing what the market is, and whether a seller’s product is “unique” or has good substitutes is the very question asked in market definition. See *United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377, 395 (1956) (explaining market definition requires ascertaining what products are “reasonably interchangeable by consumers for the same purposes”). Most courts require ordinary market definition in all tying cases. See, e.g., *It’s My Party, Inc. v. Live Nation, Inc.*, 811 F.3d 676, 681 (4th Cir. 2016) (holding that plaintiff in tying case bore initial burden of identifying relevant market); *Double D Spotting Serv., Inc. v. Supervalu, Inc.*, 136 F.3d 554, 559–60 (8th Cir. 1998) (“Double D’s complaint fails to plead a valid relevant market, and thus Double D could not demonstrate sufficient market power necessary to state or sustain a tying violation.”).

not on principle—the defendant’s procompetitive justification.⁵¹ Even when treating a tying arrangement as nominally per se illegal, “the Supreme Court has almost always been willing to consider a defendant’s offered justifications.”⁵² This is in marked contrast to price fixing’s per se rule, where the courts flatly refuse to consider the defendant’s proffered justifications.⁵³

Whatever else it was, tying’s per se rule was never—even in its incipiency—a genuine per se rule akin to the price fixing rule. So what explains its fervent articulation for several decades? Looking back at the history of tying law, the per se rule for tying rested on two conceptual pillars.

The first was the conflation of the legal monopoly granted by an intellectual property right with monopoly in an economic sense. Beginning in *Motion Picture Patents*, the Supreme Court indulged the assumption that a patent conferred “[t]he requisite economic power” to restrain competition.⁵⁴ The Justice Department’s briefs in *International Salt* urged the Court to extend the presumption of market power in patents from patent infringement cases to antitrust cases, and the Supreme Court acquiesced.⁵⁵ It later extended the conclusive presumption of market power to another species of intellectual property—copyrights—on the same logic.⁵⁶ In the 1970s, the Ninth Circuit closed the loop by extending a conclusive presumption of market power to trademarks involved in tying arrangements in franchising contracts.⁵⁷ Since intellectual property rights were understood inherently to confer

51 See *Int’l Salt Co. v. United States*, 332 U.S. 392, 397–98 (1947) (acknowledging that “a lessor may impose on a lessee reasonable restrictions designed in good faith to minimize maintenance burdens and to assure satisfactory operation,” *id.* at 397, but rejecting *International Salt’s* contention that its lease restrictions served that function), *abrogated by* *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28 (2006).

52 *AREEDA & HOVENKAMP*, *supra* note 11, ¶ 1760b; *Viamedia, Inc. v. Comcast Corp.*, 951 F.3d 429, 468 (7th Cir. 2020).

53 See Daniel A. Crane, *The Story of United States v. Socony-Vacuum: Hot Oil and Antitrust in the Two New Deals*, in *ANTITRUST STORIES* 91, 107 (Eleanor M. Fox & Daniel A. Crane eds., 2007).

54 *United States v. Loew’s Inc.*, 371 U.S. 38, 45, 45–46 (1962) (citing *Motion Picture Pat. Co. v. Universal Film Mfg. Co.*, 243 U.S. 502 (1917)).

55 *Indep. Ink*, 547 U.S. at 39.

56 See *Loew’s*, 371 U.S. at 48.

57 *Siegel v. Chicken Delight, Inc.*, 448 F.2d 43, 50 (9th Cir. 1971) (“Just as the patent or copyright forecloses competitors from offering the distinctive product on the market, so the registered trade-mark presents a legal barrier against competition. It is not the nature of the public interest that has caused the legal barrier to be erected that is the basis for the presumption, but the fact that such a barrier does exist. Accordingly we see no reason why the presumption that exists in the case of the patent and copyright does not equally apply to the trade-mark.”), *abrogated in part by* *Rick-Mik Enters. Inc. v. Equilon Enters., LLC*, 532 F.3d 963 (9th Cir. 2008).

market power, tying cases involving intellectual property could dispense with the need to prove relevant markets and market power.

The second pillar of per se illegality was the belief that tying arrangements were facially anticompetitive, summed up in the Court's assertion in *Standard Oil Co. of California v. United States (Standard Stations)* that “[t]ying agreements serve hardly any purpose beyond the suppression of competition.”⁵⁸ The Court repeated this prosaic maxim on four more occasions before finally dumping it in *Illinois Tool Works Inc. v. Independent Ink, Inc.* (about which more in a moment).⁵⁹ This maxim of disapproval expressed an attitude rather than an operative legal doctrine, and it did not answer the structural questions necessary to run a per se system—like what constitutes a tying arrangement or what considerations are included and excluded from per se analysis. But it did provide motivation for the courts to attack tying arrangements with zeal.

So the per se rule, like tying law generally, grew out of patent practices and patent law and related to the industrial-age paradigm of firms requiring their customers to agree to buy their requirements of ancillary supplies from the supplier if they wanted access to the supplier's patented machine. It was those contracts that were believed to serve hardly any purpose beyond the suppression of competition.

C. *Economic Contestation and Doctrinal Retrenchment*

Even while the Supreme Court was continuing to build the edifice of per se illegal tying, the earliest rumblings of the Chicago School cast doubt on whether tying was a competitive threat at all. In 1956, Aaron Director and Edward Levi published their essay *Law and the Future*,⁶⁰ which would eventually serve as the template for the Chicago School critique of mid-twentieth-century antitrust law. Director and Levi called for the application of economic learning to antitrust problems and, significantly, a key portion of their critique focused on the early tying cases—particularly *A.B. Dick*, *IBM v. United States*, and *Paramount*.⁶¹ In response to the leverage fear that had animated tying hostility since *United Shoe*, Director and Levi argued that even firms with market power in the tying market could not profitably use tying as a leveraging strategy to obtain a monopoly in the tied market, since

58 337 U.S. 293, 305–06 (1949).

59 *Fortner I*, 394 U.S. 495, 498 (1969); *Loew's*, 371 U.S. at 44; *N. Pac. Ry. Co. v. United States*, 356 U.S. 1, 6 (1958); *Times-Picayune Publ'g Co. v. United States*, 345 U.S. 594, 605 (1953).

60 Aaron Director & Edward H. Levi, *Law and the Future: Trade Regulation*, 51 *Nw. U. L. REV.* 281, 290–92 (1956).

61 *Id.* at 289–92.

charging a monopoly price in the tied market would cannibalize the monopolist's revenue in the tying market.⁶² Other Chicago School scholars picked up this "single monopoly profit theorem," and it became a near article of faith in Chicago's critique of the Supreme Court's tying hostility.⁶³

Director and Levi had ostensibly shown what tying was *not*—monopoly leverage—and also offered a replacement theory as to what it *was*.⁶⁴ Although firms could not obtain a second monopoly profit, they could use tying to engage in price discrimination.⁶⁵ Director and Levi did not spell out the mechanisms in their 1956 paper, but other Chicago School scholars soon would. The following year, Ward Bowman explained tying arrangements as "counting device[s] to measure how intensively the first product is being used."⁶⁶ Not only was this metering explanation competitively innocuous, it might be socially beneficial because price discrimination was understood to maximize output.⁶⁷ Robert Bork went so far as to argue that tying should be encouraged since price discrimination might increase a monopolist's output.⁶⁸

The Chicago School critique landed a one-two punch on the Supreme Court's tying doctrine. Not only was the "serve hardly any purpose" maxim economically misguided, but hostility to tying arrangements might stand in the way of efficient, output-maximizing behavior.

Among those who absorbed the Chicago School's teaching on tying was a young John Paul Stevens—who would go on to write the three most important tying cases of the next half century: *Fortner II*, *Jefferson*

62 *Id.* at 290.

63 ROBERT H. BORK, *THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF* 372–75, 380–81 (1978); RICHARD A. POSNER, *ANTITRUST LAW* 197–99 (2d ed. 2001); RICHARD A. POSNER & FRANK H. EASTERBROOK, *ANTITRUST: CASES, ECONOMIC NOTES, AND OTHER MATERIALS* 802–03 (2d ed. 1981); Ward S. Bowman, Jr., *Tying Arrangements and the Leverage Problem*, 67 *YALE L.J.* 19, 20–23 (1957); Benjamin Klein, *Tying*, in 3 *THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW* 630, 630–31 (Peter Newman ed., 1998).

64 *See* Director & Levi, *supra* note 60, at 290.

65 *Id.*

66 Bowman, *supra* note 63, at 23.

67 *See, e.g.*, Richard A. Posner, *The Chicago School of Antitrust Analysis*, 127 *U. PA. L. REV.* 925, 926 (1979) ("[P]rice discrimination is a device by which the monopolist in effect seeks to serve additional consumers, *i.e.*, those having the more elastic demands, who might be deterred by the single monopoly price that would be charged in the absence of discrimination. Thus, price discrimination brings the monopolist's output closer to that of a competitive market and reduces the misallocative effects of monopoly."). In later work, Posner cast doubt on whether the general effects of price discrimination are positive. Richard A. Posner, *Vertical Restraints and Antitrust Policy*, 72 *U. CHI. L. REV.* 229, 235 (2005) ("The effect of price discrimination on economic welfare may be generally negative, though no stronger statement is possible . . .").

68 BORK, *supra* note 63, at 375–78.

Parish Hospital District No. 2 v. Hyde, and *Independent Ink*. Stevens was a former classmate of Levi's and, when Levi took on administrative responsibilities at the University of Chicago, Stevens—then an antitrust attorney in Chicago—stepped in to co-teach antitrust with Director.⁶⁹ Stevens would later call his co-teaching with Director the most important intellectual experience of his life.⁷⁰ In 1954–1955, Stevens participated in the Attorney General's National Committee to Study the Antitrust Laws, and then, the year before Levi and Director published their influential article, Stevens gave a speech on tying arrangements at a Northwestern University conference convened to analyze the Study Committee's report.⁷¹ His remarks keyed off a footnote in the Study Committee's report, which reported that tying agreements “have been almost universally regarded as monopolistic devices,” but that “[u]pon analysis . . . the matter becomes far from obvious and perhaps should rather be termed mysterious.”⁷² Stevens framed his remarks around three illustrative types of oil sales contracts—a pure quantity contract, a requirements contract, and the provision in *FTC v. Sinclair Refining Co.* that a gas station only use the supplier's oil in a pump provided by the supplier.⁷³ Stevens argued that, although these three species of contracts had different doctrinal implications under the antitrust statutes, there was no a priori reason to treat tying arrangements more harshly than requirements contracts or ordinary sales contracts.⁷⁴ Although recognizing that any one of these types of contracts could have anticompetitive effects, he reported that Director had called his attention to the possibility that tying arrangements were used as price discrimination devices in favor of smaller buyers, a fact that should put tying in a more favorable light than the prevailing judicial hostility.⁷⁵

Stevens's 1955 speech is illuminating for two reasons. First, it shows Director and Levi's influence on Stevens's understanding of tying—an influence that would bring Stevens halfway, but only halfway, toward the Chicago School perspective, as the tying cases Stevens subsequently authored on the Supreme Court would reveal. Second, and

69 George L. Priest, *Bork's Strategy and the Influence of the Chicago School on Modern Antitrust Law*, 57 J.L. & ECON. S1, S13 (2014); George L. Priest & William Ranney Levi, *Stevens and Antitrust*, NAT'L L.J., May 24, 2010, at 46.

70 See Priest & Levi, *supra* note 69.

71 *Antitrust Administration and Enforcement and the Attorney General's Committee Report: A Brief Symposium*, 50 NW. U. L. REV. 305, 305–06 (1955); John Paul Stevens, *Tying Arrangements*, in CONFERENCE ON THE ANTITRUST LAWS AND THE ATTORNEY GENERAL'S COMMITTEE REPORT 135, 135 (James A. Rahl & Earle Warren Zaidins eds., 1955).

72 Stevens, *supra* note 71, at 135 (quoting REPORT OF THE ATTORNEY GENERAL'S NATIONAL COMMITTEE TO STUDY THE ANTITRUST LAWS 138 n.32 (1955)).

73 *Id.* at 135–37 (citing *FTC v. Sinclair Refin. Co.*, 261 U.S. 463, 474 (1923)).

74 See *id.* at 138.

75 See *id.* at 142–44.

for purposes of this Article more importantly, Stevens's speech shows the tying paradigm that he had in mind as he embarked on his judicial career. Stevens was concerned with tying contracts, or clauses in contracts that imposed tying obligations. His entire speech was framed around understanding the similarities and differences between different types of contractual obligations.

It took several decades for the Chicago School critique to begin exerting an influence on the courts. The case often assumed to represent the Chicago School break point on tying—*Fortner II*—was decided in 1977,⁷⁶ the same year as the landmark *Continental T.V., Inc. v. GTE Sylvania Inc.*⁷⁷ decision on nonprice vertical restraints. George Priest sees *Fortner II*, like *Sylvania*, as revealing “indelible evidence of Chicago school influence.”⁷⁸ But while *Sylvania* overflowed with Chicago School citations and influences, *Fortner II* is a much more factually circumscribed and intellectually modest opinion. Ken Dam's critique of *Fortner Enterprises, Inc. v. United States Steel Corp. (Fortner I)*,⁷⁹ which grew out of Aaron Director's project of having research fellows critique Supreme Court antitrust decisions,⁸⁰ received a citation in a footnote on the burden of proof to establish market power.⁸¹ Ward Bowman's article on the leverage problem also received a citation, but for the decidedly un-Chicago School proposition that if U.S. Steel was using tying to engage in price discrimination, that would imply that U.S. Steel had market power “that a free market would not tolerate.”⁸² Apart from that, the opinion—upholding the practice of providing low-cost credit for the purchase of prefabricated homes—did little to address the overall trajectory of the Supreme Court's tying cases.⁸³

In fact, when Chicago School influences on tying most directly showed up in the Supreme Court, it was in a concurring rather than majority opinion. In *Jefferson Parish*, Justice Stevens's majority opinion found that East Jefferson Hospital's exclusive contract with an anesthesiology group did not unlawfully tie operating room and anesthesiology services because the hospital was not using market power to force patients to accept anesthesiologists they did not prefer.⁸⁴ However, the majority also beat back Justice O'Connor's concurring argument for

76 429 U.S. 610 (1977).

77 433 U.S. 36 (1977).

78 Priest, *supra* note 69, at S6.

79 Kenneth W. Dam, *Fortner Enterprises v. United States Steel: “Neither a Borrower, Nor a Lender Be,”* 1969 SUP. CT. REV. 1.

80 Priest, *supra* note 69, at S5.

81 *Fortner II*, 429 U.S. at 620 n.13 (quoting Dam, *supra* note 79, at 25–26).

82 *Id.* at 617 (citing Bowman, *supra* note 63).

83 *Id.* at 622.

84 *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 26 (1984).

four Justices that it was time to abandon the *per se* rule for tying,⁸⁵ opining that “[i]t is far too late in the history of our antitrust jurisprudence to question the proposition that certain tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable ‘*per se*.’”⁸⁶ Not only would the concurring Justices have abandoned the *per se* rule for tying, but they expressed the view that tying would only be economically harmful in “rare cases,” and, citing Bork, cast doubt on whether tying arrangements that facilitated price discrimination should be unlawful since they may “decrease rather than increase the economic costs of a seller’s market power.”⁸⁷ The majority did not join issue on these arguments and, since all Justices were in agreement that the hospital should not be liable,⁸⁸ *Jefferson Parish* seemed a continuation of the Court’s trajectory from *Fortner II*. But the majority’s explicit reaffirmation of the *per se* rule would leave tying doctrine in a state of uncertainty and morbid confusion.

Post-*Jefferson Parish*, the Court returned twice to tying. Its 1992 *Eastman Kodak Co. v. Image Technical Services, Inc.* decision, in which Justice Blackmun’s five-Justice majority opinion held that Kodak could be liable under a tying theory for denying independent service organizations (ISOs) access to copier replacement parts, is widely understood as reflecting post-Chicago (not pre-Chicago) influences due to its focus on informational asymmetries, switching costs, and imperfect markets.⁸⁹ But *Kodak* never was much of a tying case and announced little of relevance to tying cases generally; indeed, the victorious ISOs abandoned their tying claims on remand and proceeded on a refusal to deal theory.⁹⁰ On the other hand, the Court’s 2006 *Independent Ink* decision *was* a significant tying case, or at least had all the makings of one. But the Court’s last word on tying failed to clear the underbrush grown up during decades of industrial-age tying law.

85 *Id.* at 35 (O’Connor, J., concurring in judgment) (“The time has therefore come to abandon the ‘*per se*’ label and refocus the inquiry on the adverse economic effects, and the potential economic benefits, that the tie may have.”).

86 *Id.* at 9 (majority opinion).

87 *Id.* at 36 & n.4 (O’Connor, J., concurring in judgment) (emphasis omitted) (citing BORK, *supra* note 63, at 398).

88 *See id.* at 33.

89 504 U.S. 451 (1992); *see, e.g.*, Christopher S. Yoo, *The Post-Chicago Antitrust Revolution: A Retrospective*, 168 U. PA. L. REV. 2145, 2165–66 (2020); Herbert Hovenkamp, *Post-Chicago Antitrust: A Review and Critique*, 2001 COLUM. BUS. L. REV. 257, 277; M. Laurence Popofsky & Mark S. Popofsky, *Vertical Restraints in the 1990s: Is There a “Thermidorian Reaction” to the Post-Sylvania Orthodoxy?*, 62 ANTITRUST L.J. 729, 731 (1994); Robert H. Lande, *Chicago Takes It on the Chin: Imperfect Information Could Play a Crucial Role in the Post-Kodak World*, 62 ANTITRUST L.J. 193, 193–94 (1993).

90 *Image Tech. Servs., Inc. v. Eastman Kodak Co.*, 125 F.3d 1195, 1201 (9th Cir. 1997) (“After remand, the case proceeded to trial in the district court. Before closing arguments, the ISOs withdrew their § 1 tying and conspiracy claims.”).

Independent Ink involved the classic industrial-age tying paradigm: the sale of a patented item (inkjet printheads) on the condition that the buyers agree to buy a second, unpatented item (ink) exclusively from the patentee.⁹¹ The legal issue before the Court was whether the fact of Illinois Tool Works' patent on the printheads conclusively established that it had market power in the tying market—which it would have under the line of cases going back to *Motion Picture Patents*.⁹² Writing for a unanimous Court, Justice Stevens dispatched the presumption of market power arising from patents.⁹³ Henceforth, plaintiffs would bear the burden of proving market power in the tying market, whether or not intellectual property rights were present.

Justice Stevens did not stop with overruling the presumption of market power, but broadly hinted that the era of judicial hostility to tying arrangements was over. He noted that “[o]ver the years, however, this Court’s strong disapproval of tying arrangements has substantially diminished.”⁹⁴ He observed that, in opposition to Justice Black’s *Fortner I* majority opinion holding that certain tying arrangements “are illegal in and of themselves,” the four dissenting Justices “[r]eflect[ed] a changing view . . . that tying arrangements may well be procompetitive,” and that their view prevailed in *Fortner II*.⁹⁵ And, he announced that the view that “[t]ying arrangements serve hardly any purpose beyond the suppression of competition,” had been rejected in *Fortner II* and *Jefferson Parish*.⁹⁶ In fact, the latter assertion was a stretch. The “serve hardly any purpose” maxim was cited in *Fortner I* in favor of liability,⁹⁷ was not cited at all in *Fortner II*, and in *Jefferson Parish* was cited only in Justice O’Connor’s concurrence calling for an end to the per se rule.⁹⁸ No matter; *Independent Ink* buried the maxim, and with it the age of judicial hostility to tying arrangements. Director and Levi’s influence on Justice Stevens seemed finally to have come to full fruition.

Or did it? Justice Stevens stopped short of announcing the death of the per se rule. To be sure, he explicitly knocked out the twin pillars upholding the per se rule: the presumption of market power for tying products supported by intellectual property rights and the view that tying arrangements are nakedly anticompetitive.⁹⁹ A few lower courts

91 See *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 32 (2006).

92 *Id.* at 31; see cases cited *supra* notes 54–59.

93 *Indep. Ink*, 547 U.S. at 46.

94 *Id.* at 35.

95 *Id.* at 35–36; *Fortner I*, 394 U.S. 495, 498 (1969).

96 *Indep. Ink*, 547 U.S. at 36.

97 *Fortner I*, 394 U.S. at 498 (quoting *N. Pac. Ry. Co. v. United States*, 356 U.S. 1, 6 (1958)).

98 *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 34 (1984) (O’Connor, J., concurring in judgment).

99 See *supra* notes 54–59 and accompanying text.

have read *Independent Ink* as jettisoning the per se rule,¹⁰⁰ but most courts have not. Seventh Circuit Judge Diane Wood, a leading anti-trust scholar, reads *Independent Ink* as explicitly refusing to jettison the per se rule.¹⁰¹ Because the Supreme Court never retracted the *Jefferson Parish* majority's assertion that "[i]t is far too late in the history of our antitrust jurisprudence to question the proposition that certain tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable 'per se,'"¹⁰² many lower courts continue to pay lip service at least to the continuation of a per se category. For instance, in the years 2019–2021, over twenty federal courts explicitly held that some tying arrangements are per se illegal.¹⁰³ Old habits die hard.

100 See *AVX Corp. v. Cabot Corp.*, 600 F. Supp. 2d 286, 288 (D. Mass. 2009) (noting that the Supreme Court "largely eviscerated the per se test" in *Independent Ink*); *Apple Inc. v. Psystar Corp.*, 586 F. Supp. 2d 1190, 1197 n.3 (N.D. Cal. 2008) ("[*Independent Ink*] rejected the per se rule in tying cases . . ."); *Hynix Semiconductor Inc. v. Rambus Inc.*, 527 F. Supp. 2d 1084, 1094 (N.D. Cal. 2007) (observing that *Independent Ink* abrogated the per se rule).

101 *Reifert v. S. Cent. Wis. MLS Corp.*, 450 F.3d 312, 322 (7th Cir. 2006) (Wood, J., concurring in judgment) ("Despite Justice O'Connor's forceful opinion concurring in the judgment, in which she argued that the time had come to jettison the per se rule in tying cases, and despite the opportunity it had as recently as March 2006 to take that step, see *Illinois Tool Works Inc. v. Independent Ink, Inc.*, [547] U.S. [28], 126 S.Ct. 1281, 164 L.Ed.2d 26 (2006), the Court has refused to do so. *Illinois Tool Works* held only that the fact that a tying product is patented does not support a presumption that the seller has market power over that product." (citation omitted)).

102 *Jefferson Par.*, 466 U.S. at 9.

103 See *Kenney v. Am. Bd. of Internal Med.*, 847 Fed. App'x 137, 145 (3d Cir. 2021); *Viamedia, Inc. v. Comcast Corp.*, 951 F.3d 429, 468 (7th Cir. 2020); *PayCargo, LLC v. CargoSprint, LLC*, 576 F. Supp. 3d 1306, 1311 (N.D. Ga. 2021); *Teradata Corp. v. SAP SE*, 570 F. Supp. 3d 810, 851 (N.D. Cal. 2021); *Epic Games, Inc. v. Apple Inc.*, 559 F. Supp. 3d 898, 1044–45 (N.D. Cal. 2021), *aff'd in part, rev'd in part*, 67 F.4th 946 (9th Cir. 2023), *cert. denied*, 144 S. Ct. 681 (2024) (mem.) and 144 S. Ct. 682 (2024) (mem.); *Edge Sys. LLC v. Ageless Serums LLC*, No. 20-cv-09669, 2021 WL 3812875, at *4 (C.D. Cal. May 11, 2021); *AngioDynamics, Inc. v. C.R. Bard, Inc.*, 537 F. Supp. 3d 273, 313 (N.D.N.Y. 2021); *Siva v. Am. Bd. of Radiology*, 512 F. Supp. 3d 864, 868 (N.D. Ill. 2021), *aff'd*, 38 F.4th 569 (7th Cir. 2022); *Innovative Health LLC v. Biosense Webster, Inc.*, No. SACV 19-01984, 2020 WL 8457483, at *5 (C.D. Cal. Dec. 11, 2020); *Ass'n of Am. Physicians & Surgeons v. Am. Bd. of Med. Specialties*, No. 14-cv-02705, 2020 WL 5642941, at *4–5 (N.D. Ill. Sept. 22, 2020), *aff'd*, 15 F.4th 831 (7th Cir. 2021); *UPPI, LLC, v. Jubilant Draximage Inc.*, No 19-00518, 2020 WL 6220818, at *14 n.19 (S.D. Ala. Sept. 18, 2020), *report and recommendation adopted*, No. 19-00518, 2020 WL 6219793 (S.D. Ala. Oct. 22, 2020); *Lazarou v. Am. Bd. of Psychiatry & Neurology*, No. 19-cv-01614, 2020 WL 5518476, at *4 (N.D. Ill. Sept. 11, 2020); *Chase Mfg., Inc. v. Johns Manville Corp.*, No. 19-cv-00872, 2020 WL 1433504, at *3 (D. Colo. Mar. 23, 2020); *Kenney v. Am. Bd. of Internal Med.*, 412 F. Supp. 3d 530, 543 (E.D. Pa. 2019), *aff'd*, 847 F. App'x 137 (3d Cir. 2021); *Presque Isle Colon & Rectal Surgery v. Highmark Health*, 391 F. Supp. 3d 485, 504–05 (W.D. Pa. 2019); *Becton, Dickinson & Co. v. Cytek Biosciences Inc.*, No. 18-cv-00933, 2019 WL 3220244, at *3 (N.D. Cal. July 17, 2019); *Jain Irrigation, Inc. v. Netafim Irrigation, Inc.*, 386 F. Supp. 3d 1308, 1314 (E.D. Cal. 2019); *Sentry Data Sys., Inc. v. CVS Health*, 379 F. Supp. 3d 1320, 1327 (S.D. Fla. 2019); *Neagle v. Goldman Sachs Grp.*,

The *per se* rule, built on now-discarded assumptions about an industrial-age paradigm, lingers on in the digital age. Tying law was already disorganized and unpredictable before the courts began to question its assumptions. Now that they have thoroughly eviscerated its conceptual foundations but left its doctrinal edifice nominally standing, tying doctrine is in ruins.

D. *The Doctrinal Morass*

To continue the legal academy's perennial overborrowing from Holmes, diagnosing any legal doctrine begins with understanding its consequences.¹⁰⁴ In the case of applying the *per se* rule to tying, the consequence most evidently cannot be the same as applying it to price fixing. A standard compendium lists the following as elements of *per se* illegal tying: "(1) that the tying arrangement affects a substantial amount of interstate commerce; (2) the two products are distinct; (3) the defendant actually tied the sale of the two products; and (4) the seller has appreciable market power in the tying market."¹⁰⁵ Element four alone makes clear that two of the important shortcuts from conventional *per se* analysis—defining relevant markets and proving market power—are inapplicable to *per se* tying analysis.¹⁰⁶ Element one calls for some analysis of the effects of the tying arrangement—also not required of horizontal price fixing¹⁰⁷—and, as noted, courts have typically allowed defendants to put on procompetitive justifications in their rebuttal case,¹⁰⁸ which is also not allowed in genuine *per se* cases.¹⁰⁹

So what's left for tying's *per se* rule to shortcut? The answer lower courts have given is that in *per se* tying cases, as distinguished from rule of reason tying cases, the plaintiff need not prove anticompetitive effects in the tied market.¹¹⁰ For the moment, put aside the obvious

Inc., No. 18-cv-00754, 2019 WL 1102199, at *11 (D. Or. Mar. 1, 2019), *aff'd sub nom.* Neagle v. Altisource Sols., Inc., 820 F. App'x 606 (9th Cir. 2020); YMD Recs., LLC v. Ultra Enters., Inc., 361 F. Supp. 3d 1258, 1265 (S.D. Fla. 2019); City of Rockford v. Mallinckrodt ARD, Inc., 360 F. Supp. 3d 730, 753 (N.D. Ill. 2019).

104 O.W. Holmes, *The Path of the Law*, 10 HARV. L. REV. 457, 460–61 (1897) ("The prophecies of what the courts will do in fact, and nothing more pretentious, are what I mean by the law." *Id.* at 461.).

105 *In re Visa Check/MasterMoney Antitrust Litig.*, 280 F.3d 124, 133 n.5 (2d Cir. 2001) (citing *United States v. Int'l Bus. Machs. Corp.*, 163 F.3d 737, 741 (2d Cir. 1998)), *abrogated on other grounds by In re Initial Pub. Offerings Sec. Litig.*, 471 F.3d 24 (2d Cir. 2006).

106 *See supra* Section I.B.

107 *See id.*

108 *See id.*

109 *See id.*

110 *E.g., In re Google Digit. Advert. Antitrust Litig.*, 627 F. Supp. 3d 346, 368 (S.D.N.Y. 2022) (citing *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 15, 17 (1984)) ("If

conflict between this statement and the need to prove that the tie “affects a substantial amount of interstate commerce,” and accept the claim at face value: per se tying eliminates one element of rule of reason analysis, the need to prove anticompetitive effects.

The first question about such a rule is when it applies. If contemporary tying law is clear about one thing, it is that the per se rule does not apply to all tying cases, but only to some. Justice Stevens made clear in *Jefferson Parish* that the vestigial per se rule was to apply only to “certain tying arrangements,”¹¹¹ and not to the one before him, which he found not illegal at all. Lower courts thus report that some tying cases are governed by the per se rule, and others by the rule of reason.¹¹²

But which cases are governed by which rule? Even putting aside Wittgenstein’s observation that rules are never sufficiently self-defining to determine their applicability and that rule application necessarily depends on socialization and training,¹¹³ in the case of tying there is not even a facially coherent formal rule of decision about when to apply the per se rule. Lower courts are left to recite the fact that either a per se rule or the rule of reason governs tying claims, and then to wonder without guidance which one to apply.

The closest the Supreme Court has come to specifying a decisional rule is Justice Stevens’s statement in *Jefferson Parish* that “[p]er se condemnation—condemnation without inquiry into actual market conditions—is only appropriate if the existence of forcing is probable.”¹¹⁴ But what follows this assertion is singularly unhelpful in determining whether the trigger is met. Justice Stevens goes on to say that the “forcing” question is about predicting “the probability of anticompetitive consequences” and that the importance of this inquiry explains the additional requirement that “a substantial volume of

monopoly power (or sufficient market power) is alleged and proven, the tying arrangement may be unlawful *per se* without the need to prove anticompetitive effects or other market conditions.”); *Presque Isle Colon & Rectal Surgery v. Highmark Health*, 391 F. Supp. 3d 485, 504–05 (W.D. Pa. 2019) (citing *Town Sound & Custom Tops, Inc. v. Chrysler Motors Corp.*, 959 F.2d 468, 475 (3d Cir. 1992)) (noting that per se tying does not require proof of anticompetitive effect); *Osbourne v. Anschutz Ent. Grp., Inc.*, CV 18-2310, 2018 WL 4566304, at *2 (C.D. Cal. Aug. 1, 2018) (citing *Cascade Health Sols. v. PeaceHealth*, 515 F.3d 883, 913 (9th Cir. 2008)) (“[A] plaintiff does not need to show anticompetitive effects in a *per se* tying case . . .”).

111 466 U.S. at 9 (emphasis added).

112 *E.g., In re Cox Enters., Inc.*, 871 F.3d 1093, 1098 (10th Cir. 2017) (explaining that plaintiff may bring either a per se or rule of reason theory); *Suture Express, Inc. v. Owens & Minor Distrib., Inc.*, 851 F.3d 1029, 1037 (10th Cir. 2017) (same).

113 LUDWIG WITTGENSTEIN, *PHILOSOPHICAL INVESTIGATIONS* §§ 143–252 (P.M.S. Hacker & Joachim Schulte eds., G.E.M. Anscombe et al. trans., Wiley-Blackwell rev. 4th ed. 2009) (1953).

114 466 U.S. at 15.

commerce is foreclosed” by the tying arrangement.¹¹⁵ “Forcing” and foreclosure of “a substantial volume of commerce” are elements in all tying cases, whether denominated per se or rule of reason.¹¹⁶ If the customer is not forced to buy the tied product, there is no tie.¹¹⁷ If the alleged arrangement does not foreclose “a substantial volume of commerce,” the jurisdictional requirement for all tying cases has not been satisfied.¹¹⁸ Thus, neither “forcing” nor foreclosure of “a substantial volume of commerce” can serve to distinguish whether the per se rule or the rule of reason applies, and lower courts have not attempted to apply those factors as triaging rules.

Instead, those lower courts that have tried to continue applying a per se rule to some tying arrangements have typically held that the per se rule applies when the defendant has market power in the tying market.¹¹⁹ But that cannot be right either. Even before *Independent Ink*, most courts required a showing of market power in the tying market in all tying cases, whether under the per se rule or rule of reason. *Independent Ink* put the question to rest, holding that “in all cases involving a tying arrangement, the plaintiff must prove that the defendant has market power in the tying product.”¹²⁰ If market power is an element of all tying cases, it cannot determine whether the per se rule or the rule of reason applies.

The few courts that have tried to explain how market power might still serve as a triaging rule despite its ubiquitous requirement have suggested that perhaps a showing of *heightened* market power in the tying market would serve to distinguish per se from rule of reason cases.¹²¹ But any court wishing to go that route runs into the immediate problem that “the Supreme Court has never defined how much market power is necessary to condemn a tying arrangement as illegal *per se*.”¹²² Without such guidance, lower courts have no basis for deciding whether or not to apply the per se rule, and thus often announce its

115 *Id.* at 16.

116 See SECTION OF ANTITRUST L., AM. BAR ASS'N, *supra* note 9, chs. 2.E.3, 2.E.4.

117 See *Jefferson Par.*, 466 U.S. at 12 (referring to forcing as essential element of an illegal tie).

118 Reifert v. S. Cent. Wis. MLS Corp., 450 F.3d 312, 317–18 (7th Cir. 2006) (“[A] tying arrangement violates antitrust law only if ‘a substantial volume of commerce is foreclosed’ because of the tie.” *Id.* at 317 (quoting *Jefferson Par.*, 466 U.S. at 16)).

119 See *Suture Express, Inc. v. Owens & Minor Distrib., Inc.*, 851 F.3d 1029, 1039–40 (10th Cir. 2017); *Town Sound & Custom Tops, Inc. v. Chrysler Motors Corp.*, 959 F.2d 468, 481 (3d Cir. 1992); *Mozart Co. v. Mercedes-Benz of N. Am., Inc.*, 833 F.2d 1342, 1345 (9th Cir. 1987).

120 *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 46 (2006).

121 See, e.g., *In re Wireless Tel. Servs. Antitrust Litig.*, 385 F. Supp. 2d 403, 414–15 (S.D.N.Y. 2005).

122 *Id.* at 414.

theoretical availability and then decide the case on some different ground. In a typical case, the U.S. District Court for the Southern District of New York recited the existence of a per se rule where some heightened threshold of market power is proved, confessed the lack of guidance on what that heightened threshold is, and then summarily abandoned the possibility of applying the per se rule and conducted the remaining analysis under the rule of reason.¹²³

In a recent decision involving the “red state” Attorneys General challenge to Google’s digital advertising practices, another judge in the Southern District of New York gestured at a potential solution: the per se rule applies “[i]f monopoly power (or sufficient market power) is alleged and proven.”¹²⁴ “Sufficient market power” is vacuous without specification of what is sufficient, but “monopoly power” is at least a doctrinally intelligible and defined idea. Monopoly power is a strong enough degree of market power to qualify exclusionary conduct as illegal under section 2 of the Sherman Act,¹²⁵ and could plausibly serve as the dividing line in tying cases.

But using monopoly power as the break point would require unprecedented doctrinal innovation and discarding a series of cases, including Supreme Court precedent, in which the defendant had monopoly power in the tying market and the court nonetheless applied the rule of reason. In *Kodak*, the Supreme Court applied the rule of reason to the independent service organizations’ tying claims (including by requiring proof of anticompetitive effects in the service market and holding that whether “any anticompetitive effects of Kodak’s behavior are outweighed by its competitive effects” was a relevant issue for trial) despite also finding that Kodak had monopoly power for section 2 purposes, as evidenced by its 100% control of the Kodak copier parts market.¹²⁶ In *United States v. Microsoft Corp.*, the D.C. Circuit found that Microsoft had monopoly power in the operating system market, but nonetheless applied the rule of reason to the government’s tying claims.¹²⁷ Other courts of appeals have rejected tying claims for lack of anticompetitive effects in the tied market—the ostensibly unnecessary element in a per se case—when the defendant had a market share of 95% or 100% in the tying market.¹²⁸ The *In re Google*

123 *Id.* at 414–31.

124 *In re Google Digit. Advert. Antitrust Litig.*, 627 F. Supp. 3d 346, 368 (S.D.N.Y. 2022).

125 *See Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451, 481 (1992) (explaining that monopoly power is a greater degree of market power than is required to state a claim under section 1 of the Sherman Act).

126 *Id.* at 486, 480–81.

127 253 F.3d 34, 51, 84 (D.C. Cir. 2001).

128 *E.g., E & L Consulting, Ltd. v. Doman Indus. Ltd.*, 472 F.3d 23, 26, 32 (2d Cir. 2006) (affirming dismissal of tying claim for lack of sufficient allegations of anticompetitive effects

Digital Advertising Antitrust Litigation court's suggestion is a nonstarter given current law. It would also effectuate the oddity of turning per se tying claims into section 2 monopolization cases, where proof of anti-competitive effects is always required.¹²⁹

There is no coherent decisional rule that allows for application of the per se rule to tying cases. But even supposing there were, application of the per se rule would run into other pressure points in tying doctrine where courts have started to harmonize tying law with the law of vertical restraints more generally, where anticompetitive effects are always at issue.¹³⁰ This tendency shows up especially with respect to the requirement—common to per se and rule of reason theories—that the plaintiff prove that “the tying arrangement forecloses a substantial volume of commerce” with respect to the tied product.¹³¹ As Christopher Leslie has shown, the courts have vacillated over whether this element is jurisdictional or substantive.¹³² The American Bar Association's model jury instructions for tying now require the plaintiff to prove “a substantial adverse effect on competition with respect to [the tied product] due to the tying arrangement” in order to satisfy the commerce element.¹³³ Thus, a plaintiff who persuades the court to apply the per se rule must prove all elements of a rule of reason claim except element five—that the tying arrangement “had a substantial adverse effect on competition as to” the tied product—and then in proving element four (the commerce element) must show that the “tying arrangement has foreclosed a substantial volume of commerce” as to the tied product.¹³⁴ Despite the obvious circularity of this approach, the requirement of proving the impairment of competition in the tied market as part of the commerce element is routinely deployed in per se tying analysis.¹³⁵ For example, in a 2017 decision regarding the alleged tying of premium cable television service to rental of set-top

even though defendant had 95% market share in tying market); *Coniglio v. Highwood Servs., Inc.*, 495 F.2d 1286, 1288, 1293 (2d Cir. 1974) (rejecting tying claim for lack of anti-competitive effect even though defendant had 100% market share).

129 See *Kodak*, 504 U.S. at 482–83 (holding that section 2 liability depends on a showing that defendant made “use of monopoly power ‘to foreclose competition, to gain a competitive advantage, or to destroy a competitor’” (quoting *United States v. Griffith*, 334 U.S. 100, 107 (1948))).

130 See *Ohio v. Am. Express Co.*, 138 S. Ct. 2274, 2283–84 (2018).

131 *Microsoft*, 253 F.3d at 85.

132 Leslie, *supra* note 10, at 2149–52.

133 SECTION OF ANTITRUST L., AM. BAR ASS'N, *supra* note 9, ch. 2.E.9.

134 *Id.* ch. 2.E.4.

135 See, e.g., *In re Cox Enters., Inc.*, 871 F.3d 1093, 1104 (10th Cir. 2017); see also *Gonzalez v. St. Margaret's House Hous. Dev. Fund Corp.*, 880 F.2d 1514, 1517 (2d Cir. 1989) (interpreting *Jefferson Parish* majority approach as requiring plaintiff to prove impairment of competition in tied market).

cable boxes, the Tenth Circuit held the per se rule inapplicable to the plaintiff's claim since the plaintiff failed to establish harm to competition in the tied market as part of its "volume of commerce" requirement.¹³⁶ Suppose the plaintiff *had* proved harm to competition in the tied market, and thus proved its eligibility for the per se rule. It would also have satisfied the only unique element of a rule of reason claim, rendering superfluous the entire enterprise of searching for a per se trigger.

Other doctrinal inventions by the lower courts can also serve as holding places for importing the inquiries into effects in the tied market that the per se rule supposedly excludes. The Fourth, Sixth, Ninth, and Tenth Circuits have all held that the "product seller [must] have a direct economic interest in the sale of the tied product before an illegal tying arrangement will be found."¹³⁷ The economic interest test is justified as ensuring that tying liability is limited to cases where the defendant is "attempting to invade the alleged tied product or service market,"¹³⁸ and as "most effectively address[ing] what [courts] regard as the true danger of tying arrangements: that the tying seller will acquire market power in the tied-product market."¹³⁹ Other courts have expressed skepticism about adding this doctrinal requirement, but those courts also require proof of anticompetitive effects in the tied market even in per se cases.¹⁴⁰ Courts tend to find ways to consider the ultimate issue of concern in antitrust cases—whether the challenged practice harms competition or has an anticompetitive effect—even when paying lip service to the idea that this inquiry is not required in per se cases.

One might reasonably ask if there is any harm to the continued existence of a per se category if, by hook or by crook, courts tend to avoid the putative implication of actually applying such a rule. Although most courts eventually find their way to an inquiry into anticompetitive effects, not all courts do,¹⁴¹ creating adjudicatory inconsistency and the prospect of condemnation of some ties that do not injure competition. Further, at a minimum, the insistence on the per se rule's continuation creates adjudicatory confusion and doctrinal mischief.

136 *Cox*, 871 F.3d at 1104.

137 *Wholesale All., LLC v. Express Scripts, Inc.*, 366 F. Supp. 3d 1069, 1080 (E.D. Mo. 2019) (quoting *Abraham v. Intermountain Health Care Inc.*, 461 F.3d 1249, 1265–66 (10th Cir. 2006) (collecting cases)).

138 *Abraham*, 461 F.3d at 1266 (quoting *Sports Racing Servs., Inc. v. Sports Car Club of Am., Inc.*, 131 F.3d 874, 888 (10th Cir. 1997)).

139 *Gonzalez*, 880 F.2d at 1517 (citing *Carl Sandburg Vill. Condo. Ass'n No. 1 v. First Condo. Dev. Co.*, 758 F.2d 203, 208 (7th Cir. 1985)).

140 *Id.* at 1516–18.

141 *Supra* note 110 and accompanying text.

The lower courts and litigants struggle to reconcile flatly contradictory statements in their circuits' precedents. They create bizarre doctrinal glosses—like commingling substantive and jurisdictional elements in the volume-of-commerce requirement or the “economic interest” test.

If the issue were only doctrinal incoherence, there would be a straightforward solution. The Supreme Court could simply announce that tying arrangements, like all other vertical restraints, are subject to the rule of reason. Many commentators favor this approach,¹⁴² and it seems like what the Court most probably will do whenever the issue is squarely presented. Such a move would tidy up the doctrinal house, but it would not address the deeper path-dependency of tying law. Tying doctrine is not in shambles merely because the Supreme Court's economic learning and disposition toward tying changed but it never fully reconciled the doctrine to its new views. It is in shambles because the entire edifice of tying law was built for a set of problems and on a set of assumptions that are no longer characteristic of most tying claims.

II. TYING IN THE DIGITAL AGE

The previous section showed that industrial-age tying law developed—and then retrenched—under a narrow set of assumptions about what tying is and how it might harm or benefit competition and consumers. That story ended with tying doctrine in shambles. Rebuilding a coherent and fitting set of tying law principles requires beginning with an appreciation of the patterns of behavior to which contemporary tying claims are addressed. I refer to these as digital-age tying problems, not because all of the claims involve digital technologies (although many do), but to demarcate the set of problems with which the original doctrines were concerned from those that preoccupy courts today.

This Part begins by tracing the evolution of tying theories from the industrial age to the digital age with a case study from the evolution of computing technology. This case study shows that tying theories evolved as technological conditions evolved. This Part then provides a typology of contemporary tying cases, which tend to turn on questions of technological design, product integration, and information control. Finally, it shows that the doctrines created to address industrial-age tying problems are ill-suited to addressing digital-age tying questions.

142 *E.g.*, Hylton & Salinger, *supra* note 13, at 508 (arguing that tying should be considered under a rule of reason analysis).

A. Contractual Tying, Technological Tying, and Product Integration

The paradigmatic industrial-age tying arrangement involved the sale or lease of a patented machine subject to the contractual requirement that customers purchase all of their future requirements of some complementary equipment or supply from the patentee. The Justice Department's successful challenge to IBM's punch cards policy in the 1930s illustrates this form of tying.¹⁴³ IBM sold patented computing machines, with computing data stored on stiff pieces of paper called punch cards.¹⁴⁴ Users purchased punch cards separately from IBM's machines,¹⁴⁵ with more intensive users buying more cards, and less intensive users buying fewer cards. IBM's leases contained clauses requiring lessees to use only punch cards manufactured by IBM and providing that the lease agreement would terminate if the customer used a competitor's punch cards.¹⁴⁶ In 1936, the Supreme Court invalidated these restrictive lease provisions under section 3 of the Clayton Act.¹⁴⁷ Its decision was premised on the view that IBM was attempting to extend its patents over the machine onto the unpatented punch cards through a "tying clause" in its lease agreements.¹⁴⁸ Chicago School critics countered that IBM was not attempting to monopolize the punch cards market, but rather using tying as a price discrimination device.¹⁴⁹

As noted in Part I, IBM's strategy of requiring lessees to commit contractually to the purchase of a complementary product is what industrial-age courts meant by "tying." When Justice Stevens stated in *Jefferson Parish* that "[i]t is far too late in the history of our antitrust jurisprudence to question the proposition that certain tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable 'per se,'"¹⁵⁰ the cases on which he relied—

143 *Int'l Bus. Mchs. Corp. v. United States*, 298 U.S. 131 (1936).

144 See JAMES W. CORTADA, *BEFORE THE COMPUTER: IBM, NCR, BURROUGHS, AND REMINGTON RAND AND THE INDUSTRY THEY CREATED, 1865–1956*, at 54 (1993).

145 *IBM*, 298 U.S. at 133–34.

146 *Id.* at 134.

147 *Id.* at 134–35, 140.

148 *Id.* at 137–38 ("The only purpose or effect of the tying clause, so far as it could be effectively applied to patented articles, is either to prevent the use, by a lessee, of the product of a competitor of the lessor, where the lessor's patent, *prima facie*, embraces that product, and thus avoid judicial review of the patent, or else to compel its examination in every suit brought to set aside the tying clause, although the suit could usually result in no binding adjudication as to the validity of the patent, since infringement would not be in issue." *Id.* at 137.).

149 See, e.g., POSNER, *supra* note 63, at 171–74 (1st ed. 1976) ("By providing the computer at cost and selling each card at a monopoly price, the computer monopolist can vary the charge for computation according to the amount of each purchaser's use." *Id.* at 173.).

150 *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 9 (1984).

International Salt, *Motion Picture Patents*, and *A.B. Dick*—were of the same character. Tying claims fitting that mold would recede and be replaced by new tying theories as the computer age was born.

IBM faced renewed antitrust scrutiny with the commercialization of mainframe computers in the 1960s.¹⁵¹ At first, IBM's computers were just processors that housed "arithmetical and logical electronic circuits."¹⁵² Most of the functions that we now take for granted as being part of computers—disk drives, memory, speakers, etc.—were considered "peripherals" and had to be bought separately and externally plugged into the computer.¹⁵³ In its evolution from a processor with peripheral plug-ins to the integrated products with which we are familiar today, the computer ran the gauntlet of two distinct types of claim that would eventually become paradigmatic of tying challenges in the digital era.

One set of claims involved design changes that created incompatibility between IBM's computers and competitors' peripheral devices. For example, in 1973, Transamerica Computer Co. brought a monopolization case alleging that "IBM redesigned the interface between the CPU and the peripherals of three tape drive systems so that [competitors'] peripherals would no longer be compatible with IBM's CPUs."¹⁵⁴ The district court found that IBM deliberately "redesigned the models to operate just short of the speed that would have enabled peripherals manufactured by [competitors] to attach, and thus that the change unreasonably restricted competition," but that Transamerica failed to establish resulting injury, and the Ninth Circuit affirmed.¹⁵⁵

The other set of claims centered on the integration of peripherals into the computer. For example, in the late 1970s, California Computer Products (CalComp) brought a tying and monopolization case against IBM alleging that IBM's integration of magnetic disk drives into its computers prevented CalComp from competing for the sale of external disk drives.¹⁵⁶ The Ninth Circuit found that the disk drive integration allowed IBM to lower its prices and to improve the

151 See Randal C. Picker, *The Arc of Monopoly: A Case Study in Computing*, 87 U. CHI. L. REV. 523, 535–36 (2020).

152 *Transamerica Comput. Co. v. Int'l Bus. Machs. Corp.*, 698 F.2d 1377, 1380 (9th Cir. 1983).

153 *Id.* ("At the heart of a computer system is the central processing unit (CPU), which houses arithmetical and logical electronic circuits. Attached to the CPU are devices called 'peripherals,' which perform input, output, storage, and control functions.")

154 *Id.* at 1380–81.

155 *Id.* at 1383, 1382–83.

156 *E.g.*, *Cal. Comput. Prods., Inc. v. Int'l Bus. Machs. Corp.*, 613 F.2d 727, 731, 744 (9th Cir. 1979).

computer's performance, and therefore that the product integration was lawful despite its allegedly exclusionary effect on competitors.¹⁵⁷

In 1981, IBM introduced the personal desktop computer, which migrated computing from the office to the home. The following year, the Justice Department dismissed its decade-long antitrust case against IBM,¹⁵⁸ but IBM was already a fading power. The company made the fatal decisions to outsource the two components that would ultimately hold most of the value of a computer: the microprocessor to Intel and the operating system to Microsoft (both in the early 1980s).¹⁵⁹ IBM's tying issues that began with contractual requirements tying in the 1930s, and then migrated to technological tying and product integration in the 1970s and '80s, finally came to a head with IBM's successor, Microsoft, in the late 1990s and the early 2000s.

Among the Justice Department's many theories of antitrust liability in the landmark *Microsoft* case decided by the D.C. Circuit was the claim that Microsoft unlawfully tied its web browser, Internet Explorer (IE), to its Windows operating system.¹⁶⁰ The first two grounds for this claim were contractual—that “Microsoft required licensees of Windows 95 and 98 also to license IE as a bundle at a single price” and that it “refused to allow [Original Equipment Manufacturers (OEMs)] to uninstall or remove IE from the Windows desktop.”¹⁶¹ The second two grounds involved technological tying and product integration: Microsoft allegedly “designed Windows 98 in a way that withheld from consumers the ability to remove IE by use of the Add/Remove Programs utility” and “designed Windows 98 to override the user's choice of default web browser in certain circumstances.”¹⁶² The court of appeals recognized that “the sort of tying arrangement attacked here is unlike any the Supreme Court has considered.”¹⁶³ It observed that “[t]he early Supreme Court cases on tying dealt with arrangements whereby the sale or lease of a patented product was conditioned on the purchase of certain unpatented products from the patentee,” whereas Microsoft involved a “tied good physically and technologically integrated with the tying good.”¹⁶⁴ Surveying the earlier computer

157 *Id.* at 744 (“IBM, assuming it was a monopolist, had the right to redesign its products to make them more attractive to buyers—whether by reason of lower manufacturing cost and price or improved performance.”).

158 *In re Int'l Bus. Machs. Corp.*, 687 F.2d 591, 594 (2d Cir. 1982).

159 PAUL E. CERUZZI, *A HISTORY OF MODERN COMPUTING* 279 (2d ed. 2003); Clayton M. Christensen, Michael Raynor & Matt Verlinden, *Skate to Where the Money Will Be*, HARV. BUS. REV., Nov. 2001, at 72, 81.

160 *United States v. Microsoft Corp.*, 253 F.3d 34, 84–85 (D.C. Cir. 2001) (en banc).

161 *Id.* at 84.

162 *Id.* at 84–85.

163 *Id.* at 90.

164 *Id.*

tying cases, including *Transamerica Computer Co. v. IBM Corp.* and *California Computer Products v. IBM Corp.* (*CalComp*), the court detected a “high risk that per se analysis may produce inaccurate results” and thus required rule of reason analysis of the government’s tying claims.¹⁶⁵

Microsoft was an en banc decision carefully crafted to achieve unanimity, and after making sweeping claims about the inapplicability of the per se rule to technological integration and technological tying, the court purported to limit its holding to software bundling.¹⁶⁶ Nothing in the logic of the court’s analysis could be so confined, however, and other courts have applied its rejection of per se analysis more broadly.¹⁶⁷ More generally, *Microsoft* may read as an idiosyncratic decision about emerging technologies, but it reflects not only evolving judicial attitudes toward tying, but also evolving economic, commercial, and technological conditions that motivated the assertion of very different species of tying claims than those asserted during the industrial age. The evolution of computing technology and associated business practices—from punch card requirements contracts, to designed incompatibility of peripherals, to incorporation of previously peripheral devices into the computer itself, and finally to software architecture decisions—reflects an important set of changes in what tying claims are about. As discussed next, the punch card cases—on which tying law was built and then disputed—are not characteristic of digital-age tying claims. Tying has come to mean something quite different.

B. Characteristic Tying Cases in the Digital Age

Tying claims following the industrial-age pattern centered on requirements contracts leveraging intellectual property rights to metered complementary products still occur from time to time. As previously noted, the last Supreme Court tying case—*Independent Ink*—involved this pattern.¹⁶⁸ But such cases are no longer representative of tying disputes. Rather, contemporary tying cases tend to involve questions of product design, functionality, compatibility, integration,

165 *Id.* at 92.

166 *Id.* at 95 (limiting holding to circumstances “where the tying product is software whose major purpose is to serve as a platform for third-party applications and the tied product is complementary software functionality”).

167 *See, e.g., In re Cox Enters., Inc.*, 871 F.3d 1093, 1111–12 (10th Cir. 2017) (rejecting per se rule as to cable and set-top box tying); *Blix Inc. v. Apple, Inc.*, C.A. No. 19-1869, 2021 WL 2895654, at *4 (D. Del. July 9, 2021) (dismissing claim that Apple tied its iOS to consumer single sign-on by embedding Sign in with Apple into iOS), *aff’d mem.*, No. 2021-2203, 2022 WL 17421225 (Fed. Cir. Dec. 6, 2022); *Apple iPod iTunes Antitrust Litig.*, No. C. 05-00037, 2009 WL 10678940, at *4 (N.D. Cal. Oct. 30, 2009) (applying rule of reason to claims that Apple tied iPod to digital music purchased through Apple’s iTunes store).

168 *Supra* text accompanying notes 100–01.

information control, pricing and other economic incentivization, non-contractual coercion, professional accreditation, intellectual property licensing, and digital terms of use. For analytical purposes, it may be useful to group the tying cases characteristic of contemporary litigation into the following buckets.

1. Technological Tying

A sizeable share of contemporary tying claims involve an allegation that the tie consisted of some technological feature of the defendant's product that prevented competition for some complementary product. An early and well-known example of such "technological tying" was presented in the Ninth Circuit's decision in *Foremost Pro Color, Inc. v. Eastman Kodak Co.*, where the court rejected a photofinisher's complaint that Kodak tied the sale of cameras to film, chemicals, and photographic paper by developing new products that were incompatible with then-existing photographic products and photofinishing equipment.¹⁶⁹ The court held that these allegations did not constitute per se unlawful tying, since customers were not "required" to use any Kodak product and a "technological interrelationship among complementary products is [not] sufficient to establish the coercion essential to a per se unlawful tying arrangement."¹⁷⁰ *Foremost* notwithstanding, technological tying claims have grown in popularity in subsequent decades. The following are representative examples of technological tying cases brought in recent years:

Robotic-surgical-instrument repair: A company that provided refurbishment of robotic surgical instruments alleged that the instruments' manufacturer redesigned the instruments to thwart third-party repair.¹⁷¹

Online video games: A PC desktop game publisher claimed that Steam's PC desktop gaming platform forced game publishers to sell their games through Steam's store by technologically limiting users' ability to purchase games through a different store.¹⁷²

169 703 F.2d 534, 542 (9th Cir. 1983), *abrogated on other grounds by* *Hasbrouck v. Texaco, Inc.*, 842 F.2d 1034 (9th Cir. 1988), *aff'd*, 496 U.S. 543 (1990).

170 *Id.*

171 *Surgical Instrument Serv. Co. v. Intuitive Surgical, Inc.*, 571 F. Supp. 3d 1133, 1138–39 (N.D. Cal. 2021) (holding tying claim sufficiently alleged); *see also* *Rebotix Repair LLC v. Intuitive Surgical, Inc.*, No. 20-cv-2274, 2021 WL 1227593, at *1–2, *9 (M.D. Fla. Mar. 8, 2021) (dismissing claims that defendant technologically tied its da Vinci robots to EndoWrist replacement parts by establishing a usage counter which rendered the parts unrepairable, making plaintiff's repair business obsolete).

172 *Wolfire Games, LLC v. Valve Corp.*, Nos. C21-0563 & C21-0872, 2021 WL 4552447, at *1 (W.D. Wash. Oct. 5, 2021) (dismissing tying claim); *see also* *Datel Holdings Ltd. v. Microsoft Corp.*, 712 F. Supp. 2d 974, 979–80 (N.D. Cal. 2010) (denying motion to dismiss

Professional social networking: An employment analytics competitor alleged that LinkedIn tied its professional social networking platform to its “people analytics services” by preventing the plaintiff from scraping LinkedIn data.¹⁷³

Search advertising: A digital media advertising company alleged that Google/YouTube tied use of Google universal search to its own advertising services by transitioning from Flash to HTML5 for playing videos on websites.¹⁷⁴

Digital music: Class action plaintiffs alleged that Apple tied purchase of digital music to iPods through digital rights management design, making digital music files only compatible with iPods.¹⁷⁵

Coffee: A rival alleged that Keurig tied single-serve coffee brewers to single-serve coffee packs by designing the brewers to be incompatible with rivals’ packs.¹⁷⁶

Enterprise data analytics: A software company alleged that its competitor tied its enterprise-resource-planning software to software for enterprise data analytics and warehousing by designing new generations of its software to be incompatible with the plaintiff’s products.¹⁷⁷

Debit cards: A rival payment systems network alleged that Visa tied its debit cards to its debit network services by requiring users to enable Visa’s PIN authentication system on all Visa signature debit cards.¹⁷⁸

Dialysis machines: A competitor alleged that the manufacturer of a reprocessing agent for use with reprocessing equipment for multiple-use dialyzers engaged in tying through software incompatibility.¹⁷⁹

claim that a video game manufacturer’s software update to its gaming system that disabled the use of third-party memory cards, meaning that players could no longer use plaintiff’s larger cards, but had to switch to smaller, “authorized” cards made by defendant, amounted to anticompetitive technological tie).

173 *hiQ Labs, Inc. v. LinkedIn Corp.*, 485 F. Supp. 3d 1137, 1141, 1149, 1155 (N.D. Cal. 2020) (granting motion to dismiss tying claim).

174 *Inform Inc. v. Google LLC*, No. 21-13289, 2022 WL 3703958, at *2–3, *7 (11th Cir. Aug. 26, 2022) (reversing dismissal of tying claim).

175 *Apple iPod iTunes Antitrust Litig.*, No. C 05-00037, 2009 WL 10678940, at *1–3, *6 (N.D. Cal. Oct. 30, 2009) (granting judgment in favor of Apple).

176 *JBR, Inc. v. Keurig Green Mountain, Inc.*, No. 14-cv-00677, 2014 WL 1767701, at *1, *3 (E.D. Cal. May 2, 2014) (staying action alleging technological tying of single-serve coffee brewers and single-serve coffee packs).

177 *Teradata Corp. v. SAP SE*, 570 F. Supp. 3d 810, 849, 865 (N.D. Cal. 2021) (granting summary judgment in favor of software company where competitor alleged that defendant tied its enterprise-resource-planning software to software for enterprise data analytics and warehousing by designing new generations of its software to be incompatible with rivals’ products).

178 *Pulse Network, L.L.C. v. Visa, Inc.*, 30 F.4th 480, 489 (5th Cir. 2022) (rejecting tying claim).

179 *HDC Med., Inc. v. Minntech Corp.*, 411 F. Supp. 2d 1096, 1099, 1105 (D. Minn. 2006) (dismissing tying claim), *aff’d*, 474 F.3d 543 (8th Cir. 2007).

In most of these examples, a technological or design feature of the defendant's product was the entire alleged mechanism of coercion, but contemporary tying cases often involve multiple dimensions. As already discussed, the *Microsoft* case involved at least three distinct tying mechanisms: (1) licensing restrictions on users and OEMs; (2) technological features that made disentangling Windows and Internet Explorer difficult; and (3) the integration of IE into Windows.¹⁸⁰ A more recent example involves a different plaintiff's take on the tying of surgical robot systems and service for those systems, discussed above.¹⁸¹ This competitor alleged that the tie consisted of both a technological element—designing the robots with artificial usage limits—and then a contractual element—requiring customers to agree not to avoid those limits.¹⁸² In other cases, the tying mechanism may be contractual, but its justifications are bound up in the technological relationship between two components.¹⁸³

As discussed in the following Part, whether or not a tying claim involves alleged tying mechanisms additional to technological design choices, the inclusion of technological coercion as the tie fundamentally shifts the legal inquiry from the contractual tying analysis that dominated during the industrial era.

2. Information Control

A type of claim similar to technological tying consists of the allegation that the defendant used its power over information to coerce customers to purchase a complementary product. These claims can overlap with technological tying when the plaintiff alleges that the tie consists of the interaction between the defendant's product design and its failure to disclose necessary information about the product.¹⁸⁴ Often, the claim centers on the defendant's refusal to make technical data available, or its disclosure of misleading technical information, which makes it difficult for rivals to provide complementary services, as seen in the following characteristic cases:

180 See *supra* notes 161–62 and accompanying text.

181 *Restore Robotics, LLC v. Intuitive Surgical, Inc.*, No. 19cv55, 2022 WL 1495005, at *2, *10 (N.D. Fla. Apr. 11, 2022) (denying summary judgment against claims by medical device service company claiming that manufacturer of surgical robot system tied service to sale of its surgical systems through licensing agreement where customers agreed that they would not avoid the usage limits built into robot's components).

182 *Id.* at *1, *3.

183 See, e.g., *Kaufman v. Time Warner*, 836 F.3d 137, 148 (2d Cir. 2016) (affirming dismissal of complaint that cable company tied premium cable television services to leasing of bidirectional cable boxes).

184 See, e.g., *Rapid Print, Inc. v. Minn. Mining & Mfg. Co.*, Civ. Action No. 78-3190, 1981 WL 2014, at *2, *4 (D. Mass. Jan. 30, 1981) (rejecting tying claim).

Jet engines: A jet engine parts manufacturer alleged the engine manufacturer tied engines to engine repairs by failing to provide complete instruction manuals for its engines, failing to provide training on its engines for mechanics, and issuing misleading service information about its engines.¹⁸⁵

Auxiliary power units: An independent service organization claimed that Honeywell's parts delays, pricing decisions, and removal of technical data acted as an effective, or "de facto," condition on sale to airlines of auxiliary power units for aircraft.¹⁸⁶

Graphics workstations: A graphics workstation producer sued Intel for allegedly tying a continued supply of central processing units and technical information with its demand for plaintiff's relinquishment of certain of its technology patents.¹⁸⁷

Computer storage: An independent service organization asserted that a computer manufacturer failed to provide the ISO with information regarding changes to direct-access storage devices (DASDs) that the manufacturer sold and serviced.¹⁸⁸

3. Product Integration

Many contemporary tying cases concern product bundling or the integration of components into a single product. Although there may be considerable overlap between technological tying and product integration theories in some instances, the core theories raise distinctive economic issues. In a product integration case, the ratio between the allegedly tying and tied products is fixed at the point of sale since the products are embedded together. There is therefore no question of the tying arrangement being a metering device to accomplish price discrimination.¹⁸⁹ By contrast, in technological tying cases, consumption of the tied product may vary with intensity of usage, and therefore serve as a price discrimination device. Product integration cases will often involve production cost savings, as was true in *CalComp*, whereas technological ties are less likely to be explicable on these grounds. Technological tying cases turn on issues of compatibility and product functionality, which may or may not also be at issue in product

185 *Dodson Int'l Parts, Inc. v. Williams Int'l Co.*, 12 F.4th 1212, 1217, 1222 (10th Cir. 2021) (rejecting tying claim).

186 *Aerotec Int'l, Inc. v. Honeywell Int'l, Inc.*, 836 F.3d 1171, 1178 (9th Cir. 2016) (rejecting independent service organization claims).

187 *Intergraph Corp. v. Intel Corp.*, 195 F.3d 1346, 1361–62 (Fed. Cir. 1999) (rejecting per se tying liability).

188 *Bell Atl. Bus. Sys. Servs., Inc. v. Hitachi Data Sys. Corp.*, 856 F. Supp. 524, 525–26 (N.D. Cal. 1993) (denying preliminary injunction).

189 See *supra* text accompanying notes 67–68.

integration cases. The following cases illustrate the sorts of technological tying claims that have been asserted in recent years:

Video game payments: Epic Games' highly publicized lawsuit against Apple involved the claim that Apple tied digital payment processing to its software application distribution system by integrating the payment system into the distribution system.¹⁹⁰

Single sign-on: A competitor alleged that Apple tied its iOS to consumer single sign-on by embedding Sign in with Apple into iOS.¹⁹¹

Mobile apps: In yet another case against the tech giant, a group of app developers alleged that Apple tied its App Store, notary stamps, and software onboarding to its iOS.¹⁹²

Catheters: A manufacturer of peripherally inserted central catheters alleged that its competitor tied its tip location systems to its catheters by embedding the tip location stylets into the catheters during the manufacturing process and selling them as a single unit.¹⁹³

College applications: A college application service alleged that its competitor tied college application services to data integration services by embedding data integration in its application service.¹⁹⁴

Cargo transfer facilitation: A business that coordinated the release of shipping cargo at storage facilities to consignees via "check-in" kiosks and mobile apps alleged that the defendant required customers to make electronic payments through its proprietary payment system.¹⁹⁵

Legal search tools: A competitor of Westlaw alleged that Westlaw unlawfully tied legal search tools and public law databases by offering them jointly in a single subscription package.¹⁹⁶

190 Epic Games, Inc. v. Apple Inc., 493 F. Supp. 3d 817, 842, 853 (N.D. Cal. 2020) (denying preliminary injunction); *see also* Kickflip, Inc. v. Facebook, Inc., 999 F. Supp. 2d 677, 689 (D. Del. 2013) (denying motion to dismiss claim that Facebook tied "virtual-currency services to the distinct product of social-game networks").

191 Blix Inc. v. Apple, Inc., C.A. No. 19-1869, 2021 WL 2895654, at *4, *6 (D. Del. July 9, 2021) (dismissing tying claim), *aff'd mem.*, No. 2021-2203, 2022 WL 17421225 (Fed. Cir. Dec. 6, 2022).

192 Coronavirus Rep. v. Apple Inc., No. 21-cv-05567, 2021 WL 5936910, at *4, *20 (N.D. Cal. Nov. 30, 2021) (dismissing claim that Apple tied App Store, notary stamps, and software onboarding to the iOS device market), *aff'd*, 85 F.4th 948 (9th Cir. 2023), *application for injunction denied mem.*, No. 23A718, 2024 WL 421280 (U.S. Feb. 5, 2024) (Kagan, J., in chambers).

193 AngioDynamics, Inc. v. C.R. Bard, Inc., 537 F. Supp. 3d 273, 283, 344 (N.D.N.Y. 2021) (denying summary judgment cross-motions).

194 CollegeNet, Inc. v. Common Application, Inc., 355 F. Supp. 3d 926, 952, 963 (D. Or. 2018) (denying motion to dismiss tying claim).

195 PayCargo, LLC v. CargoSprint, LLC, 576 F. Supp. 3d 1306, 1309, 1311, 1314 (N.D. Ga. 2021) (granting summary judgment in favor of defendant).

196 Thomson Reuters Enter. Ctr. GmbH v. ROSS Intel. Inc., C.A. No. 20-613, 2022 WL 1224903, at *3-4, *7 (D. Del. Apr. 26, 2022) (denying dismissal of tying counterclaim).

Graphic user interfaces: A designer of graphic user interfaces alleged that Microsoft tied interfaces to operating systems by embedding the interfaces in Windows.¹⁹⁷

4. Software Licenses and Terms of Use

Digital-age tying claims frequently center on software licenses, including customer terms of use or terms of service embedded in click-through internet licenses. As seen in the following examples, these alleged tying licenses may be directed at consumers, in which case they may be offered nominally free of charge,¹⁹⁸ or to business customers.

Internet search: A media company alleged that Google's terms of service created a tying arrangement because they prohibited customers from using any component of Google's digital-mapping API services with mapping services provided by non-Google firms.¹⁹⁹

Enterprise resource planning software: A provider of software support alleged that Oracle tied software upgrade licenses for its enterprise resource planning software to its own tax and regulatory support services by offering the two products exclusively to licensees as a "Software Upgrade License and Support" package.²⁰⁰

Digital maps: A digital map producer alleged that a competitor refused to license its patented navigation display technology unless a licensee also agreed to license map data for use with the licensed technology.²⁰¹

Cloud hosting services: A provider of vertical cloud hosting services alleged that its competitor tied cloud services to accounting software through license agreements.²⁰²

5. Intellectual Property Licensing

Bundled licensing of intellectual property has long been an antitrust concern. The Supreme Court has decided several antitrust cases involving bundled IP licensing, but in none of them was the plaintiff's

197 See *Caldera, Inc. v. Microsoft Corp.*, 72 F. Supp. 2d 1295, 1303, 1328 (D. Utah 1999) (denying dismissal of tying claims).

198 See Michal S. Gal & Daniel L. Rubinfeld, *The Hidden Costs of Free Goods: Implications for Antitrust Enforcement*, 80 ANTITRUST L.J. 521 (2016) (chronicling dissemination of nominally free customer products on the internet).

199 *Dream Big Media Inc. v. Alphabet Inc.*, No. 22-cv-02314, 2022 WL 16579322, at *3, *6 (N.D. Cal. Nov. 1, 2022) (dismissing complaint).

200 *Oracle Am., Inc. v. CedarCrestone, Inc.*, 938 F. Supp. 2d 895, 898, 908 (N.D. Cal. 2013) (dismissing tying claim).

201 *Tele Atlas N.V. v. NAVTEQ Corp.*, 397 F. Supp. 2d 1184, 1991–92 (N.D. Cal. 2005) (dismissing tying claim).

202 *RealPage, Inc. v. Yardi Sys., Inc.*, 852 F. Supp. 2d 1215, 1227 (C.D. Cal. 2012) (declining to dismiss tying claim).

case styled as a tying theory.²⁰³ However, in recent years the bundled licensing of IP rights, particularly by patent pools adjacent to standard-setting organizations, has been presented as a tying issue.²⁰⁴ The following cases are illustrative of contemporary tying claims relating to intellectual property licensing:

Compression and encoding of audio files: Dell alleged that a licensee of standardized technologies tied the license of technology that was essential to the practice of MP2 decoding technology and MP3 decoding technology with patents that were not essential to the practice.²⁰⁵

Digital television: A licensee of patented technologies related to implementation of an advanced television systems standard alleged that a patent pool tied patents essential to practicing the standard to non-essential patents.²⁰⁶

Compact discs: The U.S. International Trade Commission determined that six patents were unenforceable because of patent misuse through per se illegal tying, which consisted of licensing patents essential to manufacturing CD-Rs or CD-RWs according to Orange Book standards only together with patents that were not essential to that activity, but the Federal Circuit reversed.²⁰⁷

Sports apparel: A company that handled the licensing and protection of trademarks and commercial identifications of the NFL's Seattle Seahawks allegedly tied the Seahawks' trademark to another trademark through a licensing agreement.²⁰⁸

203 See *Broad. Music, Inc. v. Columbia Broad. Sys., Inc.*, 441 U.S. 1, 24–25, 24 n.43 (1979) (upholding blanket licensing of copyrighted music); *Zenith Radio Corp. v. Hazeltine Rsch., Inc.*, 395 U.S. 100, 139 (1969) (invalidating a blanket license of 500 patents subject to condition that licensee pay royalties even on radios not practicing the patent); *Automatic Radio Mfg. Co. v. Hazeltine Rsch., Inc.*, 339 U.S. 827, 834 (1950) (rejecting an antitrust challenge to patent license where royalty payments were premised on licensee's sales regardless of whether the apparatus sold used the patents in question), *overruled in part by Lear, Inc. v. Adkins*, 395 U.S. 653 (1969).

204 U.S. DOJ & FTC, *ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION* 105 (2007) (analyzing various patent licensing practices as tying arrangements).

205 *Audio MPEG, Inc. v. Dell Inc.*, 254 F. Supp. 3d 798, 808–09 (E.D. Va. 2017) (bifurcating patent misuse defense to be heard with antitrust counterclaim).

206 *Zenith Elecs., LLC v. Sceptre, Inc.*, No. LA CV14-05150, 2015 WL 12765633, at *8–9 (C.D. Cal. Feb. 5, 2015) (declining to dismiss claims that members of patent pool tied essential and nonessential patents).

207 *U.S. Philips Corp. v. Int'l Trade Comm'n*, 424 F.3d 1179, 1183, 1199 (Fed. Cir. 2005), *rev'g In re Certain Recordable Compact Discs and Rewritable Compact Discs*, Inv. No. 337-TA-474, USITC Pub. 3686 (Mar. 11, 2004) (Final).

208 *PBTM LLC v. Football Nw., LLC*, 511 F. Supp. 3d 1158, 1167, 1184–85 (W.D. Wash. 2021) (dismissing tying claim).

6. Pricing or Economic Policies

One of the most contested issues of monopolization law in recent decades has been bundled or otherwise contingent discounting, where the customer's prices, discounts, or rebates depend on the customer purchasing separate products from the seller.²⁰⁹ Often, these kinds of cases are asserted as tying violations, on the theory that the discount coerces the purchaser to purchase a second and potentially unwanted product from the seller in order to receive a favorable price on the tying product, as shown in the following representative cases:

Printer ink: An ink manufacturer alleged that Kodak tied print-heads to ink by increasing the price of printheads for customers who did not also purchase Kodak's ink.²¹⁰

Carbon steel press fittings: A maker of carbon steel press fittings allegedly made discounts contingent on customers' agreement not to purchase copper press fittings.²¹¹

Medical and surgical supplies: A distributor of sutures and endomechanical surgical supplies alleged that a competing distributor tied medical and surgical supplies through bundled discounts.²¹²

Online movies: A film producer alleged that YouTube would only agree to a revenue-sharing agreement for the plaintiff's movies if the producer also used YouTube's Content ID service.²¹³

7. Professional Accreditation

A final bucket of contemporary tying cases involves professional accreditation, usually in medicine. In many cases, the claims involve initial medical specialty certification allegedly tied to ongoing professional education requirements. In others, the claims are resonant with those the Supreme Court rejected in *Jefferson Parish* and involve hospital privileges. Here are some examples:

209 See Daniel A. Crane, *Mixed Bundling, Profit Sacrifice, and Consumer Welfare*, 55 EMORY L.J. 423 (2006).

210 *Collins Inkjet Corp. v. Eastman Kodak Co.*, 781 F.3d 264, 269, 280 (6th Cir. 2015) (affirming grant of preliminary injunction against Kodak based on allegedly tying pricing policy).

211 *NIBCO Inc. v. Viega LLC*, 354 F. Supp. 3d 566, 574, 584 (M.D. Pa. 2018) (denying motion to dismiss tying claim).

212 *Suture Express, Inc. v. Owens & Minor Distrib., Inc.*, 851 F.3d 1029, 1038, 1046 (10th Cir. 2017) (affirming summary judgment in favor of medical device company).

213 *Athos Overseas, Ltd. v. YouTube, Inc.*, No. 21-cv-21698, 2022 WL 910272, at *2-3, *5 (S.D. Fla. Mar. 29, 2022) (dismissing tying claim).

Radiology: A radiologist alleged that the American Board of Radiology tied initial certification to maintenance certification by limiting the radiologist's continuing medical education choices.²¹⁴

Orthopaedic surgery: A California surgeon alleged that the American Board of Orthopaedic Surgery refused to allow the surgeon to complete its certification examination that was needed for the surgeon to obtain medical staff privileges and employment at certain hospitals in New Jersey.²¹⁵

Internal medicine: Physicians who specialized in internal medicine alleged that the American Board of Internal Medicine tied initial certification and its maintenance of certification.²¹⁶

Psychiatry and neurology: Psychiatrists and neurologists claimed that the medical board tied continuing medical education products to initial certification.²¹⁷

Anesthesiology: An anesthesiologist claimed that a hospital tied hospital surgery to anesthesiology by denying him hospital privileges.²¹⁸

* * *

Not all digital-age tying cases fit into one of these buckets. A few cases still turn primarily on contractual commitments for the customer to purchase a complementary product from the seller.²¹⁹ Other cases involve softer forms of economic coercion to buy the tied product.²²⁰

214 *Siva v. Am. Bd. of Radiology*, 38 F.4th 569, 574, 581 (7th Cir. 2022) (affirming dismissal of tying claims).

215 *Ellison v. Am. Bd. of Orthopaedic Surgery*, 11 F.4th 200, 202–03 (3d Cir. 2021) (dismissing for lack of jurisdiction).

216 *Kenney v. Am. Bd. of Internal Med.*, 847 F. App'x 137, 139 (3d Cir. 2021) (affirming dismissal of tying claim).

217 *Lazarou v. Am. Bd. of Psychiatry & Neurology*, No. 19-cv-01614, 2020 WL 5518476, at *1, *4 (N.D. Ill. Sept. 11, 2020) (dismissing tying claims).

218 *Shah v. VHS San Antonio Partners, L.L.C.*, 985 F.3d 450, 452 (5th Cir. 2021) (affirming grant of summary judgment against plaintiff).

219 *See, e.g., Viamedia, Inc. v. Comcast Corp.*, 951 F.3d 429, 434, 436 (7th Cir. 2020) (reversing grant of summary judgment in favor of cable company that allegedly tied cooperative selling arrangements for cable advertisers to advertising representation services); *Cates v. Crystal Clear Techs., LLC*, 874 F.3d 530, 534–36 (6th Cir. 2017) (holding that homeowners stated tying claim based on allegations that neighborhood developers tied home sales and telecommunications services through exclusionary agreements that forced homeowners to pay \$1,500 infrastructure fee and monthly service fee); *Edge Sys. LLC v. Ageless Serums LLC*, No. 20-cv-09669, 2021 WL 7286036, at *1 (C.D. Cal. Oct. 24, 2021) (reporting that plaintiff alleged that counterdefendant tied its HydraFacial equipment to its serums by requiring customers to agree that they will use counterdefendant's serum if they use its equipment).

220 *See, e.g., Host Int'l, Inc. v. Marketplace, PHL, LLC*, 32 F.4th 242, 247, 253 (3d Cir. 2022) (affirming dismissal of tying claim where airport concession manager allegedly tied leases of concessions spaces to purchases of beverages from a particular soft drink company); *It's My Party, Inc. v. Live Nation, Inc.*, 811 F.3d 676, 684, 691 (4th Cir. 2016) (affirming dismissal of claims that concert promoter tied concert promotion services to concert

Tying cases come in a much greater variety of forms than in the industrial age, but the industrial-age paradigm no longer characterizes the vast majority of them. Tying claims have evolved with the technological, economic, and legal changes that marked the transition from the industrial age to the digital age. Most contemporary tying claims are bound up in questions of technological design, product engineering, information, compatibility, licensing, and pricing. Tying has changed, but the law has not kept up.

C. Why the Industrial-Age Rules Don't Make Sense for Digital-Age Cases

The legal elements through which courts run tying claims, and the way that they process the elements, continue to reflect the industrial-age tying paradigm and often makes little sense as to the claims actually before the court. Whether denominated as per se or rule of reason, the substantive elements in play include (1) evidence that there are two separate products, from the perspective of customer demand; (2) market power in the tying market; (3) coercion to buy the tied product; (4) anticompetitive effects; and (5) efficiencies. In parallel, courts and the antitrust agencies consider the prevailing alternative economic explanation for tying arrangements—that they accomplish price discrimination through metering rather than the leveraging of monopoly power.²²¹ None of these questions is well calibrated for most digital-age tying claims.

venue owned by promoter); *Chase Mfg., Inc. v. Johns Manville Corp.*, 601 F. Supp. 3d 911, 924, 935 (D. Colo. 2022) (granting summary judgment in favor of defendant manufacturer that allegedly threatened not to sell customers tying product if they purchased tied product from a competitor), *aff'd in part, rev'd in part*, 84 F.4th 1157 (10th Cir. 2023); *Packaging Sys., Inc. v. PRC-Desoto Int'l, Inc.*, 268 F. Supp. 3d 1071, 1084, 1086 (C.D. Cal. 2017) (dismissing claims alleging that sealant manufacturer impaired competition in retail distribution market by prohibiting nonaffiliated resellers from repackaging its sealant).

²²¹ See, e.g., *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 43–44 (2006) (discussing price discrimination as explanation for tying); *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 14–15 (1984) (observing that tying may “increase the social costs of market power by facilitating price discrimination”); *id.* at 28 n.47 (discounting the possibility that tying arrangement at issue was effectuating price discrimination, but observing that “[w]here variable-quantity purchasing is unavailable as a means to enable price discrimination, commentators have seen less justification for condemning tying”); *Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451, 487 (1992) (Scalia, J., dissenting) (stating that tying may be used to effectuate price discrimination); *Fortner I*, 394 U.S. 495, 513 (White, J., dissenting) (stating that tying “may be used as a counting device to effect price discrimination”); *Sheridan v. Marathon Petroleum Co.*, 530 F.3d 590, 593 (7th Cir. 2008) (“Tying agreements can also be a method of price discrimination—the more ink the buyer of a mimeograph machine uses, and hence the more he uses the machine, the more valuable in all likelihood the machine is to him.”); *Roy B. Taylor Sales, Inc. v. Hollymatic Corp.*, 28 F.3d 1379, 1383 (5th Cir. 1994) (acknowledging that tying may be used to effectuate price discrimination); *Mozart Co. v. Mercedes-Benz of N. Am., Inc.*, 833 F.2d 1342, 1345 n.3 (9th

1. Two Products and Efficiencies

A threshold requirement for a tying claim is that there be two separate products from the perspective of consumer demand.²²² In *Jefferson Parish*, the majority and concurring Justices disagreed about whether anesthesiology and surgery were two products or one, with Justice Stevens believing that the fact that patients and surgeons frequently requested a specific anesthesiologist pointed to two products,²²³ and Justice O'Connor believing that there was "no sound economic reason for treating surgery and anesthesia as separate services" and "[p]atients are interested in purchasing anesthesia only in conjunction with hospital services."²²⁴

Gauging whether there are two separate products from the perspective of consumer demand may have worked well enough as to industrial-age tying patterns involving static markets and "intuitively distinct items,"²²⁵ but it is ill fitting with respect to many of the digital-age patterns, which involve dynamic technologies, information flows, and business methods. In dynamic markets, ascertaining whether there are separate products from the perspective of past or existing consumer demand applies a backward-looking inquiry to a forward-looking problem. For example, suppose that customers had always been able to purchase disk drives separately from computers until a computer manufacturer decided to integrate the drive into the computer. The backward-looking consumer-demand inquiry would determine that disk drives and computers are separate products because customers have previously expressed a preference to buy them unbundled. But suppose that integrating the drive into the computer enhances the performance of both the computer and the drive and lowers the manufacturer's production cost and hence the consumer's price. In that case, consumers would likely prefer the bundled product, and the backward-looking inquiring into their past preferences would produce a legal answer contrary to the consumer's present interests. Such an approach could stultify innovation by deterring producers from redesigning products in ways that benefited consumers but could give rise to tying liability.

Cir. 1987) ("Tying arrangements are also viewed with disfavor because they can be used to facilitate price discrimination.").

222 See *Kodak*, 504 U.S. at 462 ("For service and parts to be considered two distinct products, there must be sufficient consumer demand so that it is efficient for a firm to provide service separately from parts."); *Jefferson Par.*, 466 U.S. at 19 (holding that "the answer to the question whether one or two products are involved turns not on the functional relation between them, but rather on the character of the demand for the two items").

223 *Jefferson Par.*, 466 U.S. at 22–24.

224 *Id.* at 43 (O'Connor, J., concurring in judgment).

225 *United States v. Microsoft Corp.*, 253 F.3d 34, 85 (D.C. Cir. 2001).

One could try to qualify the separate-products question by asking not whether consumers previously preferred to purchase the components separately, but whether they still do so in light of the challenged innovation. But the techniques typically applied to answer the separate-products question will not likely be available. If the manufacturer has integrated the two components and is no longer offering them separately, there will be no sales data available to determine consumer preferences. One could look instead to whether competitors are continuing to offer the products unbundled, as courts sometimes do,²²⁶ but basing the separate-products inquiry on the practices of competitors is not optimal. Competitors may be continuing to sell components separately because they have not yet innovated in the ways the defendant has, in which case basing the separate products inquiry on competitors' practices could penalize innovation.

Further, the proper inquiry should be focused on the particular product and business arrangements of the defendant, not other sellers. In a dynamic market characterized by differentiated products, different sellers may offer different component combinations and options appealing to different customer preferences. For example, consider two gaming platforms. One structures its technology so that only games created by that platform or its authorized affiliates function on its platform. The platform's walled-garden approach enhances users' data security and game functionality. The second platform allows use of games created by third parties. This enhances product variety and consumer choice, but at the expense of security and functionality. Consumers make trade-off decisions about which platform ecosystem optimizes their preferences. In the parlance of tying law, consumers who choose the first platform are revealing their preference that platforms and games be a single product, whereas consumers who choose the second platform consider the platform and games separate. Both of these choices can coexist in competitive markets. Determining that gaming platforms and games are separate products for all platforms because of consumers' demand functions as to the second platform would miss the fact that sellers and consumers in differentiated markets can have different preferences as to different firms.

Another problem with the way the separate-products question is currently asked is that it fails to take into account the possibility of intraproduct bundling. As noted above, many digital-age tying claims concern pricing policies intended to induce customer loyalty.²²⁷ These

226 See, e.g., *Kodak*, 504 U.S. at 462 ("Evidence in the record indicates that service and parts have been sold separately in the past and still are sold separately to self-service equipment owners.").

227 See *supra* notes 209–13 and accompanying text.

claims typically involve the assertion that a seller with market power gives a discount on the tying product in exchange for the customer's agreement to buy the tied product. But a similar result may obtain when a seller who faces no competition for some share of its sales—the incontestable segment—grants discounts on that segment in exchange for purchases in a contestable segment in which it faces competition.²²⁸ Such claims are functionally much the same as tying claims,²²⁹ even though they do not involve separate products from the perspective of consumers. There is no good reason for analyzing such claims differently from tying claims, which adherence to a rigid customer-demand approach to the separate-products inquiry would require.

2. Market Power

Independent Ink settled that market power in the tying market must be proved in all tying cases,²³⁰ but it offered no guidance on how market power should be proved. Lower courts—typically staffed by judges who are not antitrust experts and understandably find tying law mysterious for many of the reasons observed in this Article—tend to grab at the simplest proxy for market power that is readily available and has some passing support in Supreme Court precedent: market share.²³¹ Since the Supreme Court seemed to hold in *Jefferson Parish* that the defendant's 30% market share was not sufficient to establish market power, courts “have tended to enshrine [that] number” as the minimum threshold for market power.²³² The 30% threshold tends to serve as a de facto floor for establishing market power in the tying market. Market shares below 30% are insufficient to establish market power,

228 See *In re Remicade Antitrust Litig.*, 345 F. Supp. 3d 566, 578 (E.D. Pa. 2018) (denying motion to dismiss claims that manufacturer of biologic infliximab products anticompetitively bundled contestable and incontestable market segments through loyalty rebates); *Pfizer Inc. v. Johnson & Johnson*, 333 F. Supp. 3d 494, 504 (E.D. Pa. 2018) (holding that bundling contestable and incontestable market segments may in some circumstances constitute an antitrust violation); Nicholas Economides, *Tying, Bundling, and Loyalty/Requirement Rebates*, in RESEARCH HANDBOOK ON THE ECONOMICS OF ANTITRUST LAW 121, 135 (Einer Elhauge ed., 2012) (“Loyalty/Requirement Pricing Can Be Equivalent to Bundling ‘Incontestable’ and ‘Contestable’ Units of a Single Good”); Fiona M. Scott Morton & Zachary Abrahamson, *A Unifying Analytical Framework for Loyalty Rebates*, 81 ANTITRUST L.J. 777, 810–11 (2017) (discussing tying of contestable and incontestable goods).

229 Scott Morton & Abrahamson, *supra* note 228, at 810 n.181 (discussing how bundling of contestable and incontestable products is akin to tying).

230 *Supra* note 120 and accompanying text.

231 See 10 AREEDA & HOVENKAMP, *supra* note 11, ¶ 1736e1.

232 *Id.*; see also *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 27 (1984).

those not too much above 30% are likely to be held insufficient,²³³ and those well above 30% are treated as establishing market power.²³⁴

Determining market power through randomly established market-share cutoffs was already arbitrary in the industrial age,²³⁵ but it is entirely ill fitting as to the digital age. Foundationally, the entire enterprise of market definition has been criticized as “incoherent as a matter of basic economic principles.”²³⁶ While some courts have suggested that rigorous market definition as to the tying market need not be undertaken in all tying cases,²³⁷ it is impossible to measure market shares without first defining a market, as that would be calculating a fraction without knowing the denominator. Allowing for imprecise relevant-market estimations as to the tying market and then applying formulaic market-share estimations of market power based on numerical cutoffs that are the product of caselaw rather than economic theory or evidence has the effect of layering arbitrariness upon arbitrariness.

Further, market share as a measure of power is an inherently backward-looking inquiry and is misapplied as to cases involving

233 *E.g.*, *W. Power Sports, Inc. v. Polaris Indus. Partners L.P.*, 744 F. Supp. 226, 229 (D. Idaho 1990) (holding 31% market share insufficient), *rev'd on other grounds*, 951 F.2d 365 (9th Cir. 1991).

234 *See, e.g.*, *Lawter & Assocs., PLLC v. Sw. Bell Advert. L.P.*, No. CIV-07-0393, 2009 WL 10673103, at *3 (W.D. Okla. Jan. 16, 2009) (holding sufficient allegations of market share of 50–75% in tying market); *Tucker v. Apple Comput., Inc.*, 493 F. Supp. 2d 1090, 1097–98 (N.D. Cal. 2006) (holding sufficient market shares of 83%, 75%, and 90%), *abrogated on other grounds by Apple iPod iTunes Antitrust Litig.*, 796 F. Supp. 2d 1137 (N.D. Cal. 2011). *But see Kaufman v. Time Warner*, 836 F.3d 137, 143 (2d Cir. 2016) (“A high market share alone, however, is insufficient to infer a seller’s market power if other characteristics of the product market, such as low barriers to entry, high cross elasticity of demand, or technological developments in the industry, interfere with the seller’s control of prices.”).

235 Marshall Steinbaum & Maurice E. Stucke, *The Effective Competition Standard: A New Standard for Antitrust*, 86 U. CHI. L. REV. 595, 614 (2019) (“Depending on the elasticity of demand of the fringe buyers and overall supply, firms with relatively low market shares can enjoy as much, if not greater, buyer power as firms with higher market shares.”).

236 Louis Kaplow, *Why (Ever) Define Markets?*, 124 HARV. L. REV. 437, 438 (2010).

237 *See, e.g.*, *United States v. Loew’s Inc.*, 371 U.S. 38, 45 n.4 (1962) (“Since the requisite economic power may be found on the basis of either uniqueness or consumer appeal, and since market dominance in the present context does not necessitate a demonstration of market power in the sense of § 2 of the Sherman Act, it should seldom be necessary in a tie-in sale case to embark upon a full-scale factual inquiry into the scope of the relevant market for the tying product and into the corollary problem of the seller’s percentage share in that market.”); *Digidyne Corp. v. Data Gen. Corp.*, 734 F.2d 1336, 1340–41 (9th Cir. 1984) (holding that tying plaintiff does not have obligation to define relevant market as to tying product using ordinary relevant market techniques); *Datel Holdings Ltd. v. Microsoft Corp.*, 712 F. Supp. 2d 974, 998–99 (N.D. Cal. 2010) (accepting plaintiff’s contention that “it is not necessary to rigorously define a market for the product” in per se tying case, *id.* at 998).

dynamic markets, which is true of the majority of digital-age tying cases. Take, for example, the futility of gauging Apple's power in the smartphone market based on Apple's market share. Apple launched the first mass-market modern smartphone—a device without a stylus, keyboard, or keypad—in 2007. By definition, its market share at the time of the iPhone's introduction was 100% since at that moment it was the only one on the market, but competitors like Samsung and Lenovo soon entered the market with their own competitive products. Since 2007, Apple's share of smartphone sales never has exceeded 30% globally,²³⁸ and only recently topped 50% in the United States.²³⁹ Apple's alleged “walled garden” tying strategy, in which Apple purportedly designs its products to keep customers locked into the Apple ecosystem,²⁴⁰ has been the company's strategy since the introduction of the iPhone. Apple did not leverage preexisting market power to tie customers to its iPhones. Its market share in smartphones is arguably a product rather than the source of its walled-garden approach. This is not to cast judgment on whether Apple's walled-garden strategies are pro- or anticompetitive, but simply to point out that the market-share techniques of industrial-age tying law fail to capture the dynamics of fast-moving technology markets characterized by the introduction and transformative development of new products and services.

3. Forcing or Coercion

Black-letter tying law requires “forcing” or “coercion” of customers for a tie to be illegal.²⁴¹ Most compendia of the *prima facie* case to

238 Federica Laricchia, *iPhone Unit Shipments as Share of Global Smartphone Shipments from 3rd Quarter 2007 to 4th Quarter 2023*, STATISTA (Jan. 23, 2024), <https://www.statista.com/statistics/216459/global-market-share-of-apple-iphone/> [<https://perma.cc/SU66-KDAD>].

239 Federica Laricchia, *Share of Smartphone Users That Use an Apple iPhone in the United States from 2014 to 2022*, STATISTA (Oct. 30, 2023), <https://www.statista.com/statistics/236550/percentage-of-us-population-that-own-a-iphone-smartphone/> [<https://perma.cc/WH7K-J72W>] (reporting that Apple's share of U.S. smartphone users hit 48.7% in 2022); Patrick McGee, *Apple Overtakes Android to Pass 50% Share of US Smartphones*, FIN. TIMES (Sept. 2, 2022), <https://www.ft.com/content/75891d95-4432-4571-83df-b4cdf82d5da5> [<https://perma.cc/QK2G-DPSK>] (reporting that Apple's share of U.S. smartphone sales passed 50% for first time in 2022).

240 See *Epic Games, Inc. v. Apple Inc.*, 559 F. Supp. 3d 898, 1024–26 (N.D. Cal. 2021), *aff'd in part, rev'd in part*, 67 F.4th 946 (9th Cir. 2023), *cert. denied*, 144 S. Ct. 681 (2024) (mem.) and 144 S. Ct. 682 (2024) (mem.).

241 *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 12 (1984) (“Our cases have concluded that the essential characteristic of an invalid tying arrangement lies in the seller's exploitation of its control over the tying product to force the buyer into the purchase of a tied product that the buyer either did not want at all, or might have preferred to purchase elsewhere on different terms.”); *Times-Picayune Publ'g Co. v. United States*, 345 U.S. 594, 605 (1953) (“By conditioning his sale of one commodity on the purchase of another, a

prove tying list coercion as a separate and distinct legal element.²⁴² Indeed, since the Supreme Court has at times spoken of “forcing” and at other times of “coercion,” some lower courts have gilded the lily and insisted on evidence that “the seller uses *actual coercion to force* buyers to purchase the tied product,”²⁴³ a standard that invokes mafioso tactics thankfully not observed in run-of-the-mill tying cases.

The coercion standard is another aspect of tying doctrine that is badly muddled and in need of not just repair but de novo reconceptualization or even abandonment. As the Areeda and Hovenkamp treatise observes, the coercion standard often induces courts to engage in “abstract, extraneous, and metaphysical questions about whether the buyer acted ‘willingly’ or ‘voluntarily.’”²⁴⁴ Some courts reduce the coercion element to little more than a repetition of the requirement that the defendant have market power in the tying market,²⁴⁵ others look for evidence that the defendant has “conditioned” the sale of one product on the other,²⁴⁶ others accept that the bundle was the buyer’s “only viable economic option,”²⁴⁷ and yet others look for evidence of voluntariness based on notice and understanding of the tie.²⁴⁸ Without a clear understanding of what question they are even supposed to ask,

seller coerces the abdication of buyers’ independent judgment as to the ‘tied’ product’s merits . . .”).

242 *E.g.*, SECTION OF ANTITRUST L., AM. BAR ASS’N, *supra* note 9, ch. 2.E.3; *Host Int’l, Inc. v. Marketplace, PHL, LLC*, 32 F.4th 242, 253 (3d Cir. 2022) (finding no tying because the “essential element” of coercion was not present (quoting *Aquatherm Indus., Inc. v. Fla. Power & Light Co.*, 145 F.3d 1258, 1263 (11th Cir. 1998))); *Kaufman v. Time Warner*, 836 F.3d 137, 141 (2d Cir. 2016) (listing as second element of tying claim that “the seller uses actual coercion to force buyers to purchase the tied product”).

243 *Kaufman*, 836 F.3d at 141 (emphasis added).

244 10 AREEDA & HOVENKAMP, *supra* note 11, ¶ 1752e.

245 *See Tic-X-Press, Inc. v. Omni Promotions Co. of Ga.*, 815 F.2d 1407, 1415 n.15, 1420 (11th Cir. 1987) (citing *Amey, Inc. v. Gulf Abstract & Title, Inc.*, 758 F.2d 1486, 1502–03 (11th Cir. 1985); then citing *Bob Maxfield, Inc. v. Am. Motors Corp.*, 637 F.2d 1033, 1037 (5th Cir. Unit A Feb. 1981); and then citing *Ky. Fried Chicken Corp. v. Diversified Packaging Corp.*, 549 F.2d 368, 377–78 (5th Cir. 1977)) (holding that coercion is not a distinct element but evidence that two products are “‘tied’ as a matter of antitrust law” and that defendant has market power).

246 *Bogosian v. Gulf Oil Corp.*, 561 F.2d 434, 450 (3d Cir. 1977) (holding that “leverage or coercion is implicit when plaintiff proves the conditioning of sales of one product upon purchase of another”), *abrogated on other grounds by In re Ins. Brokerage Antitrust Litig.*, 618 F.3d 300 (3d Cir. 2010).

247 *Amerinet, Inc. v. Xerox Corp.*, 972 F.2d 1483, 1500 (8th Cir. 1992) (quoting *Nobel Sci. Indus., Inc. v. Beckman Instruments, Inc.*, 670 F. Supp. 1313, 1324 (D. Md. 1986), *aff’d*, 831 F.2d 537 (4th Cir. 1987)).

248 *Suburban Propane v. Proctor Gas, Inc.*, 953 F.2d 780, 788 (2d Cir. 1992) (finding no coercion where plaintiff entered into tying arrangement willingly and with “full knowledge and acceptance of its provisions”).

“courts often find coercion or volition on vague intuitive or metaphysical grounds.”²⁴⁹

Coercion is a singularly unhelpful analytical category for digital-age tying claims. To be anticompetitive in the sense that it reduces consumer welfare, a tying arrangement does not have to “force” or “coerce” buyers to do anything. Individual buyers may be oblivious or even willing participants in anticompetitive schemes that reduce their welfare. Take, for example, digital architectures that “nudge” a consumer to buy or use the tied product, for example, by setting a default, even though using a different complementary product might better serve the customer’s needs.²⁵⁰ Given limited customer understanding, sophistication, or attention, such technological nudges can be just as effective at reducing competition as a categorical requirements contract.²⁵¹ That customers have a nominally free choice to change the default does not mean that a sufficient number will do so to render the tying strategy ineffective.

Tying can work to reduce competition even when the customer is fully aware that her acceptance of the tie will reduce competition to her disadvantage. Consider bundled discounting, where the customer agrees to purchase two products from the seller in exchange for a discount or rebate. The customer may be fully aware that accepting the discount will reduce competition by excluding rivals who are unable to compete by selling both products, but she still accepts the tie for the same reason that customers may accept predatory pricing: collective action problems.²⁵² Since other customers are likely to accept the predatory price or tie, the customer’s rejection of the predator’s offer would only result in her paying a higher price both today and in the future.

One could describe the customer’s failure to overcome a technological nudge or bundled discount as coerced or forced since the customer should not be assumed to consent voluntarily to the reduction of her welfare, but at that point forcing and coercion would collapse into analysis of anticompetitive effects and lose all independent usefulness. It would be preferable to abandon the language of forcing and coercion altogether.

249 10 AREEDA & HOVENKAMP, *supra* note 11, ¶ 1752e.

250 See RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* 6 (2008).

251 See Market Structure & Antitrust Subcomm., *Report*, in STIGLER COMM. ON DIGIT. PLATFORMS, UNIV. OF CHI. BOOTH SCH. OF BUS., FINAL REPORT 23, 30–31 (2019).

252 John Vickers, *Market Power and Inefficiency: A Contracts Perspective*, 12 OXFORD REV. ECON. POL’Y 11, 24 (1996) (explaining that consumers overall would be better off if no consumer patronized a company engaged in predatory pricing but that each individual consumer is best off by patronizing that company).

4. Anticompetitive Effects

As noted, an inquiry into the anticompetitive effects of a tying arrangement was—and to some courts, remains—an unnecessary element of proof in tying cases denominated “per se” illegal.²⁵³ But while excision of other elements like forcing or coercion may be appropriate, anticompetitive effects should be one of the essential elements of a tying case. After all, preventing anticompetitive effects is the whole point of antitrust law. The reason the Supreme Court excused individualized proof of anticompetitive effects was that it believed that tying’s “pernicious effect on competition and lack of any redeeming virtue” could be “conclusively presumed . . . without elaborate inquiry as to the precise harm they have caused or the business excuse for their use.”²⁵⁴ Anticompetitive effects were never superfluous to tying law, only considered so obvious that they could be conclusively presumed. Now that the Court’s foundational assumption that tying arrangements are inherently likely to produce anticompetitive effects has eroded, individualized proof of anticompetitive effects should naturally be required in all tying cases.

And then courts would need to figure out what they mean by anticompetitive effects. Because industrial-age tying law often excused proof of anticompetitive effects, it never grappled deeply with what would count as an anticompetitive effect. Here too, the courts are all over the map about what suffices. Some courts hold that forcing a customer to buy something she doesn’t want is a sufficient anticompetitive effect,²⁵⁵ others that “foreclosure” of rivals suffices,²⁵⁶ and yet others that an increase in price or reduction in quality or innovation is necessary.²⁵⁷ These are very different conceptions of harm to competition, and none has an authoritative or coherent explanation in current caselaw.

253 See *supra* note 110 and accompanying text.

254 *N. Pac. Ry. Co. v. United States*, 356 U.S. 1, 5 (1958). The Court also believed that the per se rule would avoid “incredibly complicated and prolonged economic investigation into the entire history of the industry involved, as well as related industries, in an effort to determine at large whether a particular restraint has been unreasonable—an inquiry so often wholly fruitless when undertaken.” *Id.*

255 *E.g.*, *A.I. Root Co. v. Comput./Dynamics, Inc.*, 806 F.2d 673, 676 (6th Cir. 1986) (observing that “the evil of tie-ins exists only when the tying product can force consumers to buy an unwanted tied product”).

256 *E.g.*, *In re Cox Enters., Inc.*, 871 F.3d 1093, 1098 (10th Cir. 2017) (“[T]his element requires a showing that the tie actually foreclosed some amount of commerce, or some current or potential competitor . . .”).

257 *E.g.*, *Town Sound & Custom Tops, Inc. v. Chrysler Motors Corp.*, 959 F.2d 468, 484 (3d Cir. 1992) (citing *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 29–31, 30 n.49 (1984)) (interpreting *Jefferson Parish* as requiring empirical demonstration of effect of tying arrangement on price or quality in a rule of reason case).

The idea that forcing a customer to buy a product she doesn't want counts as harm to competition has little staying power in antitrust cases. The Ninth Circuit rightly rejected such a claim in *Brantley v. NBC Universal, Inc.*²⁵⁸ A class of retail cable and satellite television subscribers alleged that cable and satellite TV providers had unlawfully tied separate cable channels together by offering only packages of channels rather than options to subscribe to individual channels.²⁵⁹ As a result, the plaintiffs alleged that the TV providers could force them to pay for unwanted channels.²⁶⁰ In economic terms, the plaintiffs were wrong about one thing but right about another. The bundling of cable channels was not forcing them to pay for channels they didn't want, but it was possibly forcing them to pay more for channels that they did want.²⁶¹ Either way, the Ninth Circuit rejected their claim, finding that an anticompetitive effect for tying purposes required not only the charging of a supracompetitive price, but conduct that restricts competition.²⁶² This holding is consistent with the broader sweep of U.S. antitrust law, which sanctions conduct that creates, preserves, or extends market power, but not conduct that merely involves its exploitation.²⁶³

If forcing a customer to buy an unwanted product is not an anti-competitive effect, then what is? The other two dominant strains in the caselaw—foreclosure and direct evidence of consumer harm—gesture in the right direction, but have not to date provided a complete or satisfactory matrix for analysis.

If a tying arrangement “forecloses” rivals from being able to sell the tied product, that diminution in tied-market competition may predictably lead to consumer harm in the form of higher prices or reduced output, quality, or innovation. Hence, foreclosure serves as a structural or predictive means of demonstrating likely consumer harm. So far, so good. The problem is that courts have provided no robust conceptualization of what foreclosure means. Following *Fortner I*, some courts conflate foreclosure analysis with the jurisdictional requirement of a “not insubstantial” effect on interstate commerce, at which point the “foreclosure” analysis has nothing to do with an

258 675 F.3d 1192, 1195 (9th Cir. 2012).

259 *Id.* at 1195–96.

260 *Id.*

261 See Daniel Crane, *Tying and Consumer Harm*, 8 COMPETITION POL'Y INT'L 27, 31–32 (2012).

262 *Brantley*, 675 F.3d at 1199–1200.

263 *Verizon Commc'ns Inc. v. Law Offs. of Curtis V. Trinko, LLP*, 540 U.S. 398, 407 (2004) (“The mere possession of monopoly power, and the concomitant charging of monopoly prices, is not only not unlawful; it is an important element of the free-market system.”).

anticompetitive effect in the tied market.²⁶⁴ Other courts attempt to import a more substantive scope into foreclosure analysis, but do so by falling back on the same arbitrary industrial-age techniques as they use to demonstrate market power—shares of the market.²⁶⁵ Just as the defendant's market share in the tying market is only a rough predictor of its market power, so too the share of the tied market foreclosed is only a rough predictor of anticompetitive effects.²⁶⁶

The third way of proving anticompetitive effects is through direct evidence that the tie harmed consumers by increasing prices or reducing output, quality, or innovation. As already noted, showing that the tie resulted in higher prices is not sufficient to establish an anticompetitive effect, but showing that a tie caused price increases by excluding competitors in the tied market would suffice. Such direct proof of harm to competition may be difficult to establish in many cases, adding further urgency to the need for robust analytical tools for establishing probabilistic harm to competition through foreclosure of the tied market.

5. Metering and Price Discrimination

To the extent that courts have read the Chicago School memo on tying, they tend to come away with the perception that the argument in favor of tying rests on the perception that tying serves as a metering device that effectuates price discrimination, and that price discrimination may be efficiency enhancing.²⁶⁷ In response, leading scholars like Einer Elhauge have pushed back on the assumptions that price

264 See, e.g., *Cates v. Crystal Clear Techs., LLC*, 874 F.3d 530, 534 (6th Cir. 2017) (noting that foreclosure analysis “makes no reference to the scope of any particular market or to the share of that market foreclosed by the tie” (quoting *Fortner I*, 394 U.S. 495, 501 (1969))); *Gumwood HP Shopping Partners, L.P. v. Simon Prop. Grp., Inc.*, No. 11-CV-268, 2013 WL 3214983, at *12 (N.D. Ind. Mar. 13, 2013) (“The requirement that a ‘substantial volume’ of commerce in the tied product market be affected by the tie does not look to the percentage or share of the tied market affected. Rather, ‘the controlling consideration is simply whether a total amount of business, substantial enough in terms of dollar volume so as not to be merely *de minimis*, is foreclosed to competitors by the tie.” (quoting *Illinois ex rel. Hartigan v. Panhandle E. Pipe Line Co.*, 730 F. Supp. 826, 931 (C.D. Ill. 1990))).

265 E.g., *Town Sound & Custom Tops, Inc. v. Chrysler Motors Corp.*, 959 F.2d 468, 494 (3d Cir. 1992) (finding that foreclosure of 10% of the tied market would not amount to substantial foreclosure sufficient to create an anticompetitive effect).

266 Daniel A. Crane & Graciela Miralles, *Toward a Unified Theory of Exclusionary Vertical Restraints*, 84 S. CAL. L. REV. 605, 639 (2011) (“Whether foreclosure is substantial in an economic sense depends on whether the foreclosure prevents rivals from functioning efficiently in the market. Ten percent foreclosure might be enough to drive competitors out of one market whereas foreclosure of 70 percent might be perfectly consistent with vibrant competition in another.”).

267 See *supra* note 63 and accompanying text.

discrimination is efficiency enhancing or that it should legitimate anti-competitive tying schemes.²⁶⁸ The ongoing contestation over tying arrangements in judicial opinions and academic literature often makes it seem that the key issue concerns the welfare consequences of price discrimination.

While arguments over metering and price discrimination continue to be relevant as to some digital-age tying cases, they miss the boat as to most. Tying can serve as a price discrimination device when buyers of the tied product implicitly reveal their intensity of use and hence their demand elasticity by buying different quantities of the tied product.²⁶⁹ By placing a portion of the monopoly markup onto the tied product, the seller can effectively allocate a higher share of the monopoly markup to less price-sensitive customers. For this scheme to work, buyers must purchase the tied product in variable quantities.²⁷⁰ But that does not describe most of the digital-age tying patterns. In product integration cases, the tied product is integrated into the tying product, and hence the quantity of the tied product purchased by the customer is fixed at the point of sale and uniform across all customers. Software licensing cases often involve the bundling of multiple components at a single price, and hence do not involve separate metered sale of a complementary product. Digital platforms often do not charge any nominal price to users of their services,²⁷¹ and therefore are unlikely to be engaged in price discrimination through metering. Tying of standard-essential patents to those that are not standard-essential is also unlikely to result in metering, since all of the patents are being used to practice a standard, which will generally require all users to make standardized uses of patented technologies. Finally, accreditation licensing likely does not involve variable consumption of the tied product, since professional continuing education requirements are typically uniform across all licensed entities.

The likely efficiency justifications for digital-age tying claims are broader and more varied than price discrimination. They tend to concern technological compatibility and functionality, product performance, production or distribution cost, consumer security and experience, and mechanisms of price competition between rival producers. Understanding digital-age tying claims and the underlying tying practices to which they relate requires moving beyond the static conception of tying that undergirded industrial-age tying law.

268 Elhauge, *supra* note 13, at 426–30.

269 *Id.* at 404.

270 See Erik Hovenkamp & Herbert Hovenkamp, *Tying Arrangements and Antitrust Harm*, 52 ARIZ. L. REV. 925, 939 (2010).

271 See Gal & Rubinfeld, *supra* note 198 (chronicling phenomenon of “free goods” in digital economy and implications for antitrust enforcement).

III. WORKABLE TYING RULES

Tying law is incoherent and badly in need of an overhaul. Its current doctrinal structure reflects not only the vestiges of long-superseded economic assumptions, but also historical path-dependent appendages. Substantive, textual, and jurisdictional requirements are carelessly commingled, as with the requirement that the tying arrangement affect a “non-insubstantial” volume of interstate commerce or the “economic interest” test.²⁷² The doctrine needs to be rebuilt on a streamlined basis, with an eye to including elements that reflect the matters sensibly in dispute in digital-age tying litigation.²⁷³

The concern that should animate tying law may be stated succinctly as follows: a seller uses its market power over one product to induce customers to purchase or consume a second product without a sufficient efficiency justification and with anticompetitive effect. That formulation suggests the following elements: (1) market power; (2) inducement; (3) separate products; (4) lack of justificatory efficiencies; and (5) anticompetitive effects. As discussed below, the separate-products and efficiencies elements collapse analytically into a single set of questions, although courts might wish to keep them separate for purposes of allocating burdens of pleading, proof, or persuasion.

A. Market Power

Post-*Independent Ink* tying doctrine treats the market-power inquiry in the formal buckets of market definition and market-share analysis, with the defendant’s market share in the tied market often conclusive on whether or not market power is found.²⁷⁴ The tying-market-power question is usually treated as unconnected to the question of anticompetitive effects in the tied market. A tying plaintiff must first adequately check the box of market power in the tying market and, if subsequently required to prove anticompetitive effects in the tied market, start over again as to the economic attributes of the tied market. This approach ignores two important principles. First, the ultimate concern in tying cases is not the seller’s status in the tying market, but whether the challenged behavior threatens competition in the tied market. Second, and relatedly, the amount of tying-market power necessary to harm competition in the tied market depends on the economic characteristics of the tied market, such that the question

272 See *supra* notes 137–40 and 264 and accompanying text.

273 For example, there is simply no need for a tying-specific jurisdictional requirement. The general jurisdictional requirement applicable to any federal antitrust claim should suffice. See, e.g., SECTION OF ANTITRUST L., AM. BAR ASS’N, *supra* note 9, ch. 1.D.

274 See *supra* notes 230–34 and accompanying text.

of tying-market power cannot be analyzed in a vacuum without regard to the question of anticompetitive effects in the tied market.

A tying arrangement harms competition when it results in foreclosure of rivals in the tied market. As discussed further below, foreclosure should be understood economically as the result of an unjustified tying arrangement preventing a rival firm from operating at a competitively optimal or sufficient scale. The proper question as to the tying market is whether the seller possesses sufficient power to achieve that foreclosure in the tied market by linking tied-market sales to tying-market sales. The tying-market-power and tied-market-foreclosure inquiries are therefore inextricably linked. And, since the amount of foreclosure necessary to achieve foreclosure in the tied market varies by market, so should the required amount of power in the tying market.

To illustrate, consider a gaming platform that designs its hardware only to work with games created by the platform or its licensed partners. Under conventional tying law, whether or not the platform has market power in the gaming hardware market would be determined based on the platform's market share in the hardware market, with a share above 30% necessary for market power to be found.²⁷⁵ But an arbitrarily ascertained minimum-market-share number provides little useful information on the subject of interest—whether the tying arrangement forecloses competition in the games software market. Answering that question first requires articulating a viable theory of what share of foreclosure in the gaming market is sufficient to threaten competition. Suppose that foreclosure of 50% of the gaming market is the threshold at which competition would be harmed. Knowing that information makes sensible the task of asking about the sufficiency of the defendant's market power in the tying market: How much market share in the hardware market is necessary to foreclose half of the games market? In some cases, the defendant's tying-market share and tied-market foreclosure share may be identical, in which case determining the foreclosure share necessary to harm competition also answers the tying-market-share question. In other cases—for example, one gaming platform is more intensively utilized than another such that a platform's hardware and games market shares are less strictly correlated—knowing the necessary foreclosure share in the tied market will be just the beginning point for tying-market-power analysis. Either way, the market-power inquiry should begin with analysis of the necessary degree of tying-market foreclosure.

Beyond market share, the other principal market-power inquiry should relate to entry barriers. Particularly in dynamic markets of the

275 See *supra* note 234 and accompanying text.

kind at issue in many of the digital-age tying cases, market shares are volatile, contingent, and susceptible to rapid flux as firms leapfrog each other through innovation and repositioning.²⁷⁶ Absent high entry barriers in the tying market, even a firm able to foreclose a substantial portion of the tied market today may find such a strategy backfiring if it induces entry into the tying market.

B. *Inducement*

Current doctrine requires “force” or “coercion” by the seller.²⁷⁷ As shown in Part II, that form of words is metaphysically confusing and neglects the reality that noncoercive seller strategies can induce buyers to purchase or consume separate products in ways that harm competition and reduce consumer welfare. At the same time, tying law needs to preserve some criterion requiring proof that there actually was a tie. If a supermarket offers hot dogs and hot dog buns for sale and customers invariably buy them together in the same store, that simply demonstrates that hot dogs and buns are strict complements and that customers minimize their transaction costs by buying them at the same time. Something far more than that should be necessary to demonstrate a tie.

Rather than coercion, the relevant criterion should require proof that the seller induced buyers to select the tied product in some way that reflects the influence of the seller’s market power rather than competition on the merits. That the seller induces joint purchasing cannot be enough. A supermarket that places hot dogs next to hot dog buns induces a joint purchase, but by appealing to customer convenience rather than leveraging market power. By contrast, when Microsoft coded its operating system software to override a user’s decision to remove Internet Explorer as the default browser, it was inducing customers to use IE rather than a competitive browser in a way that reflected its market power in Windows.²⁷⁸ This was not coercive in any strict sense—persistent users could still choose to override Microsoft’s overrides and install Netscape Navigator, and some did—but it did reflect the market power–based inducement, a necessary condition for a tie.

276 See Howard A. Shelanski, *Information, Innovation, and Competition Policy for the Internet*, 161 U. PA. L. REV. 1663, 1692–93 (2013) (discussing competition by “sequential monopolies that leapfrog each other” through technological innovation, *id.* at 1693).

277 See *supra* note 241 and accompanying text.

278 See *United States v. Microsoft Corp.*, 253 F.3d 34, 65–66 (D.C. Cir. 2001).

C. *Separate Products and Efficiencies*

As noted in the previous Part, determining whether there are two separate products by assessing past consumer demand or the ongoing practices of competitors is ill fitting as to the set of commercial practices characteristic of digital-age tying challenges and threatens to stultify innovation.²⁷⁹ While some separate-products inquiry is necessary for a tying claim to make sense, that inquiry should be based on the presence or absence of sufficient justifications for the seller's bundling or linking of the components rather than a backward-looking inquiry into customer demand or competitors' practices. In other words, the separate-products question is inseparable from the efficiencies question. The proper question is whether consumers are better off with the integrated product than with the option for unbundled sales. That question, in turn, requires analyzing two kinds of possible efficiencies resulting from the alleged tying: (1) production- or distribution-cost savings passed on to consumers; and (2) enhanced product functionality.

Exactly whether or how to draw lines between the separate-products and efficiencies questions has proved challenging. As the Areeda and Hovenkamp treatise acknowledges,

[d]efining the screen provided by the separate-products test poses a dilemma. For such a screen to have value it must embody criteria that courts can apply without repeating the very sort of full-blown inquiry intended to be screened out. But for such a screen to be desirable, the choice of screening criteria must reflect the underlying legal policy.²⁸⁰

Nonetheless, the treatise argues against combining the separate-products and efficiencies questions on five grounds.²⁸¹ First, it believes that this approach is foreclosed by the caselaw; second, that it is "likely to obfuscate or confuse matters, especially if such consideration is implicit or sub rosa"; third, that "considering justifications in deciding the single-product issue tends to marginalize them"; fourth, that "considering justifications as part of the single-product inquiry, rather than as a defense, rigidifies the inquiry"; and fifth, that combining the separate-products and efficiencies inquiries would deprive the separate-products test of its value as a screen.²⁸²

None of those arguments provides a sufficient reason to hermetically separate the separate-products and efficiencies arguments. As to the first objection based on existing doctrine, this Article has shown

279 See *supra* notes 222–24 and accompanying text.

280 10 AREEDA & HOVENKAMP, *supra* note 11, ¶ 1741c.

281 *Id.* ¶ 1741b.

282 *Id.*

that tying caselaw is an incoherent mess based on dated assumptions, and that a near wholesale reconsideration of its doctrinal architecture is required. The other four objections go to the potential confusion that would arise in litigation from combining the two questions, and the potential to undercut the efficiencies defense by combining it with the separate-products question. But those arguments assume that the separate-products and efficiencies issues have some normatively appealing analytical difference—that they in fact are and should be different questions. In my view, they are not, or should not be. Instead, the ultimate question should be whether consumers *would want* to purchase the two products separately if they understood the ostensible benefits of the tie, a question that turns on the tie's efficiencies.

To see how this unified test would work in practice, consider the example of the sale of left and right shoes only in pairs. Suppose a person with only one foot, or who had lost one of their shoes, tried to purchase only a left or right shoe, and when denied that option, brought a tying case. The conventional “single product” question would dismiss that person's claim on the grounds that almost all shoe customers wish to buy shoes in pairs, and almost all shoe sellers sell them only in pairs. That majoritarian answer would be of little comfort to our hypothetical one-footed customer. Under the test I am proposing, the inquiry would go further (although reach the same result). The reason that right and left shoes are a single product—pairs—for purposes of tying law is not just because, conventionally, most customers and sellers have thought of them that way, but because most customers have two feet and wish to have symmetrical shoes *and* the costs of selling shoes individually would increase the costs of shoes to all customers, which the majority of customers would not want.²⁸³

The reason for not answering the single-products question from backward-looking evidence is not only to avoid false positives, but also to avoid false negatives. For example, consider a dominant online platform that seeks to retain its monopoly over a particular ecosystem as the ecosystem expands and adds new functionalities. As the platform creates new features for the ecosystem, it does so in ways that require platform users to use only the platform's proprietary features and excludes competitors' ability to offer competitive ones. A separate-products test that operated under the current consumer-demand norms would screen out a tying claim. Since the new feature was never offered separately, there would be no market evidence of consumer

283 See, e.g., David S. Evans & Michael Salinger, *Why Do Firms Bundle and Tie? Evidence from Competitive Markets and Implications for Tying Law*, 22 YALE J. ON REGUL. 37 (2005) (explaining tying in various competitive markets, including pain relievers and cold medicines, foreign electrical plug adapters, and midsized automobile sedans, as induced by cost savings from tying that are passed on to consumers).

demand for it separately. And since the feature was inexorably tied to the platform at the moment of its commercialization, competitors never had a chance to offer a substitute. Perversely, the separate-products screen would screen out a tying claim based on the platform's success in preventing consumers or competitors from ever having a choice of buying or offering a competitive feature.

The alternative is to allow the plaintiff to make a *prima facie* case of the presence of two separate products by showing that the defendant has intertwined the new feature into the platform without any sufficient justification. While that inquiry might place a burden on the plaintiff to prove a negative consisting of facts within the defendant's knowledge or control, there are available judicial techniques sensibly to allocate burdens of proof, persuasion, and production, as courts typically do in rule of reason litigation.²⁸⁴ For instance, the plaintiff could be tasked with the *prima facie* burden of showing that the defendant's design decision prevented consumers from exercising a choice that would have been technologically feasible and beneficial to consumer interests. The defendant could then respond by showing that the alternative design proposed by the plaintiff would have been unduly costly or impaired the product's functionality. The plaintiff could then rebut by showing that the efficiencies claimed by the defendant could have been achieved in a manner less restrictive of competition. And, ultimately, the finder of fact might be called upon to determine whether any anticompetitive consequences of the defendant's tying arrangement outweighed any benefits.²⁸⁵

How questions of this kind might be structured by courts would depend to a large degree on procedural context. What a plaintiff must allege to survive a motion to dismiss, what it must show is a genuine issue of material fact at summary judgment, and what it must ultimately prove to prevail at trial are all very different questions. My goal here is not to sketch a comprehensive plan for judicial management of tying litigation, but rather to advocate a substantive approach to the separate-products question that ultimately asks about the justifications for the alleged tie. That would mark a considerable improvement over the status quo.

D. Anticompetitive Effects

The ultimate issue in a tying case is the very one that the *per se* rule purported to excise from tying analysis: whether the tying

²⁸⁴ See, e.g., *McWane, Inc. v. FTC*, 783 F.3d 814, 833 (11th Cir. 2015) (discussing structured rule of reason).

²⁸⁵ *United States v. Microsoft Corp.*, 253 F.3d 34, 96 (D.C. Cir. 2001) (discussing need to show that harms outweighed benefits in the tied market).

arrangement harms competition. The presence or absence of anti-competitive effects should be the focal point of tying analysis. Plaintiffs could seek to prove that element through direct or structural evidence, and usually should be required to demonstrate some degree of both.

Direct evidence of anticompetitive effects would tend to demonstrate that the tie led to price increases or reductions in output, quality, or innovation.²⁸⁶ Importantly, such evidence need not be shown as to the tied market, if it can be shown as to the tying market. Firms may engage in defensive leveraging through tying, a strategy in which a firm forecloses competition in the tied market not in order to extract a monopoly profit from the tied market but rather to erect entry barriers in the tying market.²⁸⁷ In such cases, the monopolist may never raise its price or otherwise diminish consumer value in the tied market. Indeed, in many digital-age cases, it may give away a high-quality tied product for free, with consumers paying the price in the tying market.

Although a tying plaintiff should not have to prove a price increase (actual or probable) in the tied market, it should be required to demonstrate structural harm to competition through foreclosure of the tied market, without which a tying arrangement could not erect entry barriers in the tying market. Here, foreclosure should be given a substantive economic meaning, and not merely the thin version associated with the jurisdictional requirement of proving a “not-insubstantial” effect on interstate commerce. The foreclosure should be “substantial” in the sense of exclusive-dealing law—of a sufficient degree to impair the ability of rivals to compete effectively in the tied market.²⁸⁸ Typically, this analysis should have reference to whether the amount of tied-market foreclosure deprives rivals of a reasonable opportunity to achieve minimum viable scale or minimum efficient scale in the tied market.²⁸⁹ As noted above, the relationship between scale

286 Some plaintiffs have argued that the mere inability of customers to freely mix and match the tied and tying products as they prefer amounts to a loss of consumer choice that is itself an anticompetitive effect. The Supreme Court rejected such a theory in *Jefferson Parish*, in which it acknowledged that some customers would prefer to match surgery services at East Jefferson Hospital with an anesthesiologist different from the ones made available by the hospital, but that the deprivation of that choice did not amount to an actionable anticompetitive effect. *Jefferson Par. Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 28–30 (1984). Every tying arrangement prevents customers from freely mixing and matching the tied and tying product, but that has never been sufficient to constitute an anticompetitive effect, nor could it without doing severe damage to the economy.

287 See Elhauge, *supra* note 13, at 417–18; Robin Cooper Feldman, *Defensive Leveraging in Antitrust*, 87 GEO. L.J. 2079 (1999) (explaining some monopoly-leveraging behavior as effort to prevent erosion of market power in tying market).

288 Crane & Miralles, *supra* note 266, at 638–46.

289 *Id.*; see also Joshua D. Wright, *Moving Beyond Naïve Foreclosure Analysis*, 19 GEO. MASON L. REV. 1163, 1167–69 (2012).

and foreclosure will vary considerably by market, and generic, a priori market-share or foreclosure-share numbers do not provide useful markers. The burden should be on the plaintiff to develop a plausible economic theory about how much nonforeclosed space in the tied market is required for a sufficient number of rivals to function at a fully competitive level with respect to such indicia as price or innovation, and then demonstrate how the tying arrangement closes down the space in the tied market below the necessary level.

CONCLUSION

Tying law is a mess, not only for the often-assumed reason that industrial-age courts wrongly presumed that tying arrangements are invariably anticompetitive. It is a mess because its doctrines were founded on assumptions about what tying is that no longer have much bearing on the kinds of tying arrangements that give rise to antitrust claims. Reforming tying law for the digital age requires understanding what tying has come to mean and structuring workable legal rules that match the reality of digital-age tying.

This Article has proposed some guidance on how such rules might be broadly structured. It has not argued for the consonance of those proposals with the text of the Sherman, FTC, or Clayton Acts, for three reasons. First, at least the Sherman and FTC Acts, and to a large degree the Clayton Act, are sufficiently open textured to admit a broad range of interpretations as to tying. Second, the mess that is tying law may be a Gordian knot requiring the sword of legislation. Third, questions about how to structure tying law are not unique to the United States, but arise also in the other 120 competition-law regimes around the world. Any jurisdiction writing rules on tying should begin with an appreciation of what tying actually looks like in the digital age.

