THE "LICENSE AS TAX" FALLACY

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ABSTRACT

Intellectual property licenses are commonly portrayed as a "tax" that limits access to technology assets, which in turn stunts innovation by intermediate users and inflates prices for end-users. Renewed skepticism toward IP licensing, and associated judicial and regulatory interventions that apply per se-like liability rules under patent and antitrust law to IP licensing, overlook the fact that IP licenses typically play a "positive-sum" enabling function, rather than a "zero-sum" exclusionary function, by mitigating expropriation risks that would otherwise frustrate transactions between the holders of complementary specialized IP and non-IP assets. As illustrated by paradigm examples of licensing and other IP-dependent arrangements in content and technology markets, these transactional structures facilitate value-creating exchanges of knowledge assets, promote the division of labor among innovation and production specialists, and lower entry costs for firms that have strong innovation capacities but weak production and distribution capacities. An analytical framework that overlooks the enabling function of IP licensing is prone to recommend "false positive" policy actions that undermine the formation of markets in IP assets and, more generally, induce organizational distortions and reduce competitive intensity by disadvantaging R&D-specialist entities that rely on licensing-based monetization mechanisms while favoring integrated firms that maintain end-to-end commercialization structures.

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I. INTRODUCTION

Casual metaphors can have dangerous consequences. It has long been common in academic, judicial, and regulatory commentary to characterize intellectual property ("IP") rights as monopolies[1] and IP licenses as a "tax" that inflates the prices of consumer goods for end-users and impedes the flow

1. For a discussion of the historical characterization of patents as monopolies, see generally Giles S. Rich, *Are Letters Patent Grants of Monopoly?*, 15 W. NEW ENG. L. REV. 239 (1993); Frank H. Easterbrook, *Intellectual Property Is Still Property*, 13 HARV. J.L. & PUB. POL'Y 108, 108–09 (1990); Roger E. Meiners & Robert J. Staaf, *Patents, Copyrights, and Trademarks: Property or Monopoly?*, 13 HARV. J.L. & PUB. POL'Y 911, 915–16 (1990).

of informational assets for improvers and other intermediate users.[2] This long-running "license-as-tax" analogy has led many scholars, regulators, and courts to focus on the risk that a purportedly monopolistic IP owner can use contractual instruments to unilaterally expand the effective scope of their IP portfolio and as a result, upset the legislatively designed balance between promoting incentives for innovators and preserving access for users. Judicial rhetoric reflects the strong influence that this analogy has exerted on legal reasoning and outcomes.

In 1944, the Supreme Court dramatically characterized an antitrust case involving a "tying" clause in a patent license agreement as "a graphic illustration of the evils of an expansion of the patent monopoly."[3] In 1962, the "IP = monopoly" equation underpinned the Court's application of a rule of "per se" liability[4] to condemn a tying arrangement even without specific evidence of market power, stating that "[t]he requisite economic power is presumed when the tying product is patented or copyrighted."[5] In a motion filed in 2017 in an antitrust litigation against Qualcomm, the Federal Trade Commission ("FTC") used the words, "tax" and "taxpayer" or close derivatives, no less than 50 times in a 32-page document, to refer to the defendant's purportedly anticompetitive patent licensing practices.[6]

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2. For a discussion of the characterization of patent licenses as a "tax" in the software context (but without endorsing that characterization), see Colleen V. Chien, *Software Patents as a Currency, Not Tax, on Innovation*, 31 BERKELEY TECH. L.J. 1669 (2016). For examples of the "license as tax" analogy, see Frederick M. Abbott, *Rethinking Patents: From 'Intellectual Property' to 'Private Taxation Scheme'*, *in* 1 KRITIKA: ESSAYS ON INTELLECTUAL PROPERTY 1, 2–16 (Peter Drahos, Gustavo Ghindi & Hanns Ulrich eds., 2015) ("Patents are, in essence, a private right to tax . . . ."); Robin Feldman & Mark A. Lemley, *Do Patent Licensing Demands Mean Innovation?*, 101 IOWA L. REV. 137, 142 (2015) (contemplating that IP licensing intermediaries act as "tax collectors for small inventors"); Michele Boldrin & David K. Levine, *The Case Against Patents* 2 (Fed. Rsrv. Bank of St. Louis, Working Paper No. 2012-035A) (describing efforts by Microsoft to "impose a licensing fee" on the Android smartphone market); *id.* at 5 (describing patent litigation as an attempt to "tax consumers, new entrants and any potential competitor"); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, *in* 1 INNOVATION POLICY AND THE ECONOMY 119, 121, 125 (Adam B. Jaffe et al. eds., 2001) (analogizing a patent royalty to a "tax" that impedes further R&D).

3. Mercoid Corp. v. Mid-Continent Inv. Co., 320 U.S. 661, 666 (1944). A tying clause refers to a contractual clause that conditions the right to purchase a seller's primary product (for example, salt-processing machinery) upon purchase of a necessary complementary product (for example, salt) from the seller.

4. In antitrust law, a rule of "per se" liability requires only evidence that the defendant or defendants engaged in a particular business practice, even absent a showing of competitive harm. *See* FED. TRADE COMM'N & U.S. DEP'T OF JUST., ANTITRUST GUIDELINES FOR COLLABORATIONS AMONG COMPETITORS 3 (2000), https://www.ftc.gov/sites/default/files/documents/public_events/joint-venture-hearings-antitrust-guidelines-collaboration-among-competitors/ftcdojguidelines-2.pdf.

5. United States v. Loew's, Inc., 371 U.S. 38, 45 (1962).

6. FTC's Opposition to Qualcomm's Motion to Dismiss, Fed. Trade Comm'n v. Qualcomm Inc., 411 F. Supp. 3d 658 (N.D. Cal. 2017) (No. 5:17-cv-00220-LHK).

This is not simply a question of appropriate nomenclature. As a patent textbook published in 1890 observed, "[t]he question whether a patent privilege is a monopoly is not a mere question of words."[7] The FTC's antitrust litigation, which relied explicitly on a "license as tax" theory of harm, initially resulted in a district court order (later reversed on appeal[8]) that would have compelled the world's leading chip-design firm in wireless communications to rewrite hundreds of licensing contracts with device producers and share some of its most valuable technology with direct competitors in the chip market.[9] The extent to which patent and antitrust law should impose limitations on IP licenses remains unsettled as the global digital economy undergoes the transformational shift towards the 5G-enabled "Internet of Things."[10] Remarkably, the property-rights arrangements that underlie the generation and supply of technology inputs in the multi-billion-dollar market for wireless computing and communications devices—which, in the Internet of Things, will encompass not just computing and communications but also automotive, manufacturing, and other industries[11]—may turn to a great extent on whether courts and competition regulators[12] presumptively view IP licenses as a value-depleting "tax" on consumers and improvers or rather, as a value-enhancing mechanism for transferring and pricing informational assets among innovators, investors, and other participants in the innovation ecosystem. In the current policy climate among competition regulators and, to a more variable extent, among courts, it is the former approach that is ascendant.

Skepticism toward IP licensing has not always been the prevailing approach among regulators and courts. Starting in the late 1970s, courts relaxed or eliminated most rules of per se liability that had been routinely applied to IP licensing practices as a matter of antitrust law (or the closely related doctrine of patent misuse),[13] reflecting several decades of scholarly critique of the economic shortsightedness of antitrust jurisprudence in general, and the antitrust treatment of licensing practices in particular.[14] In 1995, the U.S. Department of Justice ("DOJ") and the FTC released the Antitrust Guidelines for the Licensing of Intellectual Property (the "1995 Guidelines"), which effectively codified this judicial shift. In its two most fundamental statements, the 1995 Guidelines rejected any presumptive attribution of market power to

7. 1 WILLIAM C. ROBINSON, THE LAW OF PATENTS FOR USEFUL INVENTIONS § 12 (1890).

8. Fed. Trade Comm'n v. Qualcomm, Inc., 969 F.3d. 974 (2020).

9. Fed. Trade Comm'n v. Qualcomm, Inc., 411 F. Supp. 3d 658, 783 (N.D. Cal. 2019).

10. For a review of 5G technology and its expected applications in a variety of markets, see GSMA, THE 5G GUIDE: A REFERENCE FOR OPERATORS (2019).

11. *Id.*

12. Throughout this Article, I use "competition law" and "antitrust law", including derivative terms, interchangeably, to reflect both U.S. and non-U.S. terminology that is customary in this field.

13. *See infra* notes 43–46 and accompanying text.

14. For further discussion, see *infra* note 42.

an IP owner and recognized that IP licenses generally promote efficient purposes in the commercialization of IP assets.[15] This appropriately cautious approach toward overriding privately negotiated IP licensing arrangements absent compelling evidence of actual or likely anticompetitive effects is now being contested, both in the United States and worldwide. Notwithstanding the nominal reaffirmation in 2017 by U.S. antitrust agencies of the 1995 Guidelines,[16] a sequence of Supreme Court decisions and regulatory actions by competition authorities in the United States and other countries, accompanied by support from some scholarly and policy commentators and advocacy efforts by some of the world's largest technology firms,[17] have restored an increasingly rigid view of IP licensing as posing an inherently high risk of anticompetitive effects, which therefore warrants a relaxed evidentiary burden to find that a particular licensing practice violates the antitrust laws.[18] This represents a return, at least in the context of IP licensing, to the once-defunct "inhospitality" tradition in antitrust, in which courts and regulators viewed business practices under a difficult-to-rebut presumption of anticompetitive effects.[19]

In the IP context, this revived version of the inhospitality tradition generally presumes that licensing inflates access costs for intermediate and end-users "excessively" (relative to what is typically an unspecified socially

15. U.S. DEP'T OF JUST. & FED. TRADE COMM'N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY § 2.2 (1995) [hereinafter 1995 GUIDELINES] ("The agencies will not presume that a patent, copyright, or trade secret necessarily confers market power upon its owner."); *id.* at § 3.1 ("[I]ntellectual property licensing arrangements are typically welfare-enhancing and procompetitive . . . ."). In 2017, the FTC and DOJ largely reaffirmed the substance of the 1995 Guidelines. U.S. DEP'T OF JUST. & FED. TRADE COMM'N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY (2017) [hereinafter 2017 GUIDELINES].

16. 2017 GUIDELINES, *supra* note 15.

17. For examples of advocacy by certain academics, technology companies, and technology industry trade associations for constraints on the licensing and enforcement of standard-essential patents, see APP ASS'N ET AL., STANDARDS, LICENSING, AND INNOVATION: A RESPONSE TO DOJ AAG'S COMMENTS ON ANTITRUST LAW AND STANDARD-SETTING (2018), https://www.ftc.gov/system/files/documents/public_comments/2018/08/ftc-2018-0055-d-0031-155033.pdf; COMPUT. AND COMMC'NS INDUS. ASS'N ET AL., INDUSTRY LETTER TO AAG DELRAHIM REGARDING STANDARDS, INNOVATION AND LICENSING (2018), https://www.ccianet.org/wp-content/uploads/2018/01/Industry-Letter-to-DOJ-AAG.pdf.

18. *See* David. J. Kappos, *The Antitrust Assault on Intellectual Property*, 31 HARV. J.L. & TECH. 665, 665–66, 672–73 (2018); Joshua D. Wright & Douglas H. Ginsburg, *Whither Symmetry? Antitrust Analysis of Intellectual Property Rights at the FTC & DOJ*, 9 COMPETITION POL'Y INT'L 41, 44–48 (2013).

19. The "inhospitality" phrase is generally attributed to an often-quoted statement by Professor Donald Turner, author of a leading antitrust treatise and a former head of DOJ Antitrust: "I approach territorial and customer restrictions not hospitably in the common law tradition, but inhospitably in the tradition of antitrust law." Oliver E. Williamson, *Assessing Vertical Market Restrictions: Antitrust Ramifications of the Transaction Cost Approach*, 127 U. PA. L. REV. 953, 959 (1979) (citing Stanley Robinson, N.Y. State Bar Ass'n Antitrust Law Symposium 29 (1968)).

efficient rate). This presumption then drives actions by courts and regulators to "protect" the public interest by intervening to restrain the purportedly overreaching demands of IP owners. This view is reflected in the conventional rhetoric used in commentary on licensing among many academics and practitioners, such as statements that the IP owner "imposes" or "demands" a certain royalty.[20] Such statements imply that the IP owner sets prices at will, reflecting its purported position as a monopolist that faces no competition from other technologies. This view is similarly reflected in formal economic models of IP licensing, which posit that the IP owner assesses a "tax" against technology users, which in general may or may not be net-welfare-enhancing as a matter of dynamic efficiency.[21] Based on the "IP = monopoly" equation, some economists move beyond this agnostic position and largely dismiss the entire patent system as a preferred tool for incentivizing innovation.[22]

While this analytical framing of IP markets facilitates the application of standard monopoly pricing models,[23] it suffers from two errors of commission and omission: (i) it relies on the false assumption that IP licensors typically exert market power,[24] and (ii) it overlooks the circumstances in which IP licenses widely enable value-enhancing transactions in content and

20. *See, e.g.*, Dennis W. Carlton & Allan L. Shampine, *Patent Litigation, Standard-Setting Organizations, Antitrust, and FRAND*, 22 TEX. INTELL. PROP. L.J. 223, 231 (2014) ("Each firm with SEPs imposes a royalty that generates a negative externality on the other patent holders by reducing the output of the licensee."); George S. Cary et al., *The Case for Antitrust Law to Police the Patent Holdup Problem in Standard Setting*, 77 ANTITRUST L.J. 913, 917 (2011) (describing a scenario in which "each patent holder demands a royalty that exceeds the competitive value of its particular technology").

21. *See, e.g.*, Vincenzo Denicolo, *Do Patents Over-Compensate Innovators?*, 22 ECON. POL'Y 680, 683, 686 (2007) (describing a patent as a "legal monopoly" and formalizing the welfare "trade-off between innovation and monopoly distortions"); Michael R. Kremer, *Patent Buyouts: A Mechanism for Encouraging Innovation*, 113 Q.J. ECON. 1137, 1137 (1998) ("[P]atents and copyrights . . . provide inventors with monopolies over goods produced using their ideas."); Alan V. Deardorff, *Welfare Effects of Global Patent Protection*, 59 ECONOMICA 35, 35 (1992) ("The cost of providing patent protection . . . is that it permits the patent-holder to exercise monopoly power . . . . [P]atent protection [seeks] to achieve a desirable balance between incentives to invent and gains to consumers from products after they have been invented.").

22. For the most well-known example, see MICHELE BOLDRIN & DAVID LEVINE, AGAINST INTELLECTUAL MONOPOLY (2008), who argue for the abolition of intellectual property rights in all or most markets. For more attenuated versions of this type of argument, see Kremer, *supra* note 21 (arguing that prizes in the form of "patent buyouts" by the government should be used to supplement the patent system); Joseph E. Stiglitz, *Economic Foundations of Intellectual Property Rights*, 57 DUKE L.J. 1693, 1697 (2008), (arguing that innovation policy should more heavily favor using prizes and public funding over patents to incentivize innovation).

23. *See, e.g.*, Kremer, *supra* note 21, at 1137–38 (referring to the output distortions induced by "monopoly pricing" of patented technologies); Stiglitz, *supra* note 22, at 1714 (analogizing the patent system to a system of "[f]inancing research through 'monopoly power' . . . using a distortionary tax").

24. *See infra* Part IV.A.

technology markets.[25] Respectively, these analytical simplifications inherently lead to systematic overestimation of the social costs and underestimation of the social gains generated by the patent system. Most fundamentally, this stylized framework neglects the manner in which IP-dependent transactions expand the size of (rather than simply assessing a fee against) the economic "pie" by supplying the legal infrastructure for efficient transactions that might not otherwise have taken place. Much of the legal and economic literature's overreliance on theoretical models, reluctance to re-examine settled assumptions, and failure to examine the characteristics of "real-world" markets in generating, financing, and licensing IP assets are prone to yield erroneous policy conclusions in both IP and IP-related antitrust law.

Determining the appropriate presumption that should drive the antitrust treatment of IP licensing—that is, whether it is best understood as an extractive monopoly franchise or a value-enhancing transactional tool—is not merely a strategic exercise in burden-shifting or a cosmetic exercise in rhetoric. In the hands of courts and antitrust regulators, a one-sided focus on the exclusionary effects of IP licensing that pays little or no attention to its transaction-enabling effects can lead to limitations being imposed on innocuous or welfare-enhancing business practices. These false positive errors can then induce an organizational skew in innovation markets that distorts competitive conditions by favoring larger firms that mostly monetize R&D internally through vertically integrated structures while disfavoring smaller and other firms that mostly monetize R&D externally through vertically disintegrated structures predicated on licensing relationships with producers, distributors, and other participants in the innovation ecosystem. Counterintuitively, antitrust interventions to protect intermediate and end-users against the assumed pricing power of IP licensors can instead simply protect incumbents, discourage entry, and ultimately reduce competitive intensity.

The license-as-tax analogy may be so persistent in part because the everyday uses of IP licensing in technology and content markets are opaque at the retail point of sale and represent a relatively neglected corner of scholarship on antitrust and IP law among legal academics and economists, who have mostly focused on the use of patents in the adversarial context of infringement litigation.[26] This Article seeks to correct this skew in academic and policy

25. For extensive discussion of this point, see *infra* Part III.

26. For related observations, see Jonathan M. Barnett, *Why Is Everyone Afraid of IP Licensing?*, 30 HARV. J.L. & TECH. 123, 124–25 (2017) [hereinafter Barnett, *Why Is Everyone Afraid*] (arguing that judicial and academic enthusiasm for imposing limitations on licensing freedom ignores the efficiency-enhancing transactional functions of IP licenses); Chien, *supra* note 2, at 1676–78 (observing that academic scholarship on IP tends to focus on the use of patents as an enforcement tool in litigation, rather than the use of patents in sale and licensing transactions). Of course, there are exceptions. For contributions to the scholarly study of licensing in the economics literature, especially with respect to sequential innovation, see Jerry R. Green & Suzanne Scotchmer, *On the Division of Profit in Sequential Innovation*, 26 RAND J. ECON. 20 (1995); Ashish Arora, *Licensing Tacit Knowledge: Intellectual Property Rights and*

discussions with an "on the ground" perspective informed by the large pool of negotiated IP transactions that take place on a daily basis in the technology marketplace, rather than the much smaller pool of IP litigations that take place periodically in the courtroom. In particular, I use selected "paradigm" real-world transactions drawn from a variety of industries to illustrate how IP licensing supplies a value-creating mechanism that facilitates the assembly of complementary IP and non-IP inputs and the transformation of those inputs into goods and services for consumption by end-users. This "business-aware" understanding of IP licensing illustrates the substantial extent to which the license-as-tax analogy, whether deployed substantively or rhetorically, overlooks the constructive functions of IP transactions in innovation ecosystems.

This Article's contextualized approach to IP licensing provides the basis for constructing an analytical foundation for identifying and evaluating the value-enhancing functions played by IP rights in real-world transactional environments. At a general level, IP licensing enables two primary structures for efficiently commercializing IP assets and concurrently exploiting the specialization efficiencies that arise from the division of labor that characterizes a market-driven economy. First, licensing supports vertical relationships between upstream firms that excel in innovation and a downstream network of specialized entities that execute the production, distribution, and other functions that are necessary to embed a new technology in technically and commercially viable products and services. Second, licensing facilitates the exchange of informational assets in joint ventures, alliances, and other horizontal relationships that firms would otherwise decline to join given the risk of knowledge leakage to actual or potential competitors.

Achieving a fuller appreciation of the enabling functions of IP rights in transactional environments yields policy implications for the antitrust treatment of IP licensing and related business practices. With the important exception of horizontal arrangements involving IP assets that are substitutes, which warrant close scrutiny to guard against collusion risk, an understanding of IP licensing informed by real-world business practices supports the presumption that licensing transactions generally yield net welfare gains by enabling value-enhancing arrangements that would otherwise not be viable due to expropriation risks. Relatedly, IP licensing can facilitate entry by firms that have specialized expertise in discrete portions of the market supply chain but lack the capital or technical capacities required to embody that expertise in goods for the target intermediate or end-user market. Consistent with the approach reflected in the 1995 and 2017 Guidelines but contrary to recent trends in judicial decisions and regulatory policy, these considerations recommend

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the Market for Know-How, 4 ECON. INNOVATION & NEW TECH. 41, 42–43 (1995); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSPS. 29 (1991). For contributions relating to IP licensing in the legal academic literature, with a focus on commercialization activities, see *infra* note 158.

caution when courts or agencies contemplate making antitrust interventions that may place at risk the legal predicates for licensing and other forms of private ordering in content and technology markets.

This Article proceeds as follows. In Part II, I describe historical trends in the treatment of IP licensing under U.S. patent and antitrust law, which I then use to situate recent actions in the United States and other commercially significant jurisdictions that have limited the enforcement and licensing capacities of IP owners. In Part III, I describe the mechanisms by which IP rights support certain paradigm categories of vertical and horizontal licensing arrangements. In Part IV, I explore the normative implications of an enabling view of IP licensing for antitrust policy, including analysis of the extent to which antitrust interventions in IP licensing markets can induce organizational distortions that have adverse competitive effects. In Part V, I conclude.

II. LEGAL ENCROACHMENTS ON INTELLECTUAL PPROPERTY LICENSING

Recent years have witnessed a steady legal contraction of the transactional latitude that had been enjoyed by IP rights holders since approximately the onset of the shift in antitrust jurisprudence starting in the late 1970s. These limitations arose through a combination of decisions by the U.S. Supreme Court and statements and actions by competition agencies in the United States and other commercially significant jurisdictions, both starting approximately in the mid-2000s. Below I describe these recent developments, situated within historical trends in the legal treatment of IP licensing, as a matter of both antitrust and patent law.

A. *Historical Background*

At the most general level, the law can adopt two polar approaches to the regulation of IP licensing. On the one hand, the law can adopt a laissez-faire approach in which IP licenses are treated no differently than any other agreement under the common law of contract, which generally enforces contractual terms without any inquiry into the substance of those terms, so long as the standard formation requirements are met. On the other hand, the law can adopt an interventionist approach in which IP licenses are subject to a variety of mandatory provisions that may prohibit or require the use of certain terms, up to and including the most extreme form of intervention in which the IP licensor is required to license all interested parties at a judicially determined "reasonable" or even zero-dollar royalty. A rich variety of intermediate approaches occupy the range between these two poles on the regulatory continuum and any such approach necessarily reflects a balance between preserving freedom of contract, which favors the laissez-faire approach, and mitigating anticompetitive risks associated with certain types of IP licenses, which favors some of form of an interventionist approach.

In the late nineteenth and early twentieth centuries, U.S. courts operated close to the laissez-faire pole of this continuum, imposing few, if any, constraints on the terms of IP licenses, other than any existing constraints under the common law of contract, both before and after enactment of the Sherman Act in 1890. This approach is exemplified by the Supreme Court's 1902 decision in *E. Bennett & Sons v. National Harrow Co.,* in which the Court promulgated the "general rule" of "absolute freedom in the use or sale of rights under the patent laws."[27] As part of a general shift toward a skeptical view of patents starting in the late 1930s, the Roosevelt administration in the later years of the New Deal adopted a highly interventionist approach toward patent licensing.[28] During 1938-1941, the Temporary National Economic Committee, a committee organized by Congress to examine economic concentration, undertook hearings on the patent system, with a focus on cross-licenses that purportedly implemented cartels between large U.S. and German firms in various industries.[29] Concurrently, the Antitrust Division of the Department of Justice ("DOJ Antitrust"), under the leadership of Thurman Arnold, embarked on a campaign of vigorous antitrust enforcement, which encompassed multiple suits that targeted various IP licensing practices.[30]

The investment paid off, resulting in a sequence of Supreme Court precedents that considerably increased the antitrust risk exposure of firms engaged in IP licensing. This occurred through three key doctrinal shifts during the 1940s. First, the Court issued a sequence of decisions finding antitrust violations in the case of patent licenses that were issued by a single licensor to multiple licensees and imposed resale price maintenance requirements, treating this practice as a *de facto* horizontal price-fixing cartel coordinated by the licensor.[31] Second, the Court specifically treated tying and resale price maintenance clauses in IP licenses as per se violations under the antitrust laws.[32] Third, the Supreme Court bolstered the doctrine of patent misuse

27. E. Bement & Sons v. Nat'l Harrow Co., 186 U.S. 70, 91 (1902).

28. For a detailed account, see Jonathan M. Barnett, *The Great Patent Grab*, *in* THE BATTLE OVER PATENTS: HISTORY AND POLITICS OF INNOVATION 208, 210 (Haber & Lamoureaux eds., 2021) [hereinafter Barnett, *Patent Grab*].

29. *Id.* at 212.

30. *Id.*

31. United States v. Line Material Co., 333 U.S. 287, 307 (1948); United States v. U.S. Gypsum Co., 333 U.S. 364 (1948); United States v. New Wrinkle, Inc., 342 U.S. 371, 379 (1952).

32. United States v. Univis Lens Co., 316 U.S. 241, 254 (1942) (holding that a resale price maintenance clause in a patent license is per se illegal under the Sherman Act); Int'l Salt Co. v. United States, 332 U.S. 392, 396 (1947) (finding a per se violation under the antitrust laws with respect to a tying clause in the lease of a patented machine). The earliest indications of this judicial shift can be found in the Court's decisions in United Shoe Machinery Corp. v. United States, 258 U.S. 451 (1922), in which it found an antitrust violation with respect to a contractual clause conditioning the lease of patented shoe machinery equipment on the exclusive purchase of certain required supplies from the lessor. Until the Court's decisions in the 1940s, however, the ability of patentees to enforce use restrictions in IP licenses remained

under which plaintiffs can block enforcement of a patent on the ground that the patentee has used it in a manner that exceeds the scope of the patent franchise. Specifically, in the *Morton Salt* decision, the Court held that a tying provision in a license agreement can constitute patent misuse even if it would not violate the antitrust laws, which in turn precludes the patent owner from pursuing an infringement claim against the licensee.[33] This ruling was significant because it effectively enabled licensees to block the enforcement of a patent license as well as the underlying patent, even if the terms of the license would otherwise be immune to challenge under an antitrust cause of action. The *Morton Salt* case illustrates the efficacy of this litigation strategy. The appellate court had found that the contested tying clause, requiring that lessees of a salt tablet depositing machine only use salt tablets sold by the lessor, could not have any plausible foreclosure effect on the tied product market (salt), given that it was far larger than the tying product market (equipment for depositing salt tablets).[34] The Supreme Court nonetheless found patent misuse, which precluded the patent owner from bringing a breach of contract or patent infringement cause of action against the licensee.[35]

In the ensuing decades, the judiciary largely maintained this IP-skeptical approach, regularly declining to enforce tying, exclusivity, and other clauses in IP licenses under either per se or quasi-per se applications of the antitrust laws or the similarly relaxed standards of the patent misuse doctrine, which generally relieved plaintiffs from showing competitive harm.[36] Courts were

unclear in light of other decisions by the Court upholding these restrictions. *See* United States v. Gen. Elec. Co., 272 U.S. 476 (1926) (upholding resale price maintenance clause in patent license); Gen. Talking Pictures Corp. v. W. Elec. Co., 304 U.S. 175 (1938) (upholding field-of-use limitation in patent license).

33. Morton Salt Co. v. G.S. Suppiger Co., 314 U.S. 488, 490 (1942).

34. *Id.* at 490.

35. *Id.* at 494. In a companion case, the Court adopted a similar principle concerning the effect of patent misuse on the patentee's ability to pursue an infringement cause of action. *See* B.B. Chem. Co. v. Ellis, 314 U.S. 495 (1942).

36. *See, e.g.*, McCullough v. Kammerer Corp., 166 F.2d 759, 761 (9th Cir. 1948), *cert. denied* 335 U.S. 813 (1948) (finding patent misuse due to exclusive distributorship clause that unreasonably extended "monopoly of the patent"); Berlenbach v. Anderson & Thompson Ski Co., 329 F.2d 782, 784 (9th Cir. 1964) (upholding dismissal of patent infringement suit on the ground that the patentee had entered into a licensing agreement that contained an exclusivity clause, which constituted patent misuse even absent evidence of competitive harm); Zenith Radio Corp. v. Hazeltine Rsch., Inc., 395 U.S. 100, 140 (1969) (holding that it is patent misuse if a patentee uses its "statutory monopoly . . . to coerce an agreement to pay a percentage royalty on" goods not using the patent); Key Pharms., Inc. v. Lowey, 373 F. Supp. 1190, 1193 (S.D.N.Y. 1974) (relying on rule of per se illegality against tying clause in patent license that applied to nonpatented articles and holding that "no proof of substantial lessening of competition" is required); Dubuit v. Harwell Enters., 336 F. Supp. 1184, 1187 (W.D.N.C. 1971) (finding antitrust violation and patent misuse due to tying clause in patent license that required licensees to purchase only fabrics and accessories bearing licensor's trademark); Sonobond Corp. v. Uthe Tech., Inc., 314 F. Supp. 878, 880 (N.D. Cal. 1970) (reiterating principle that tying clause requiring or inducing licensee to purchase unpatented components from licensor can constitute

particularly vigilant toward tying practices involving IP-protected products, which were effectively subject to a per se prohibition given the presumption of market power then attributed to an IP right. *United States v. Loew's*, decided in 1962, illustrates the force of this presumption. The Court stated: "[T]he existence of a valid patent on the tying product, *without more*, establishes a distinctiveness sufficient to conclude that any tying arrangement involving the patented product would have anticompetitive consequences."[37]

Judicial zeal toward purportedly anticompetitive licensing practices was matched by regulatory zeal. In a now largely forgotten enforcement campaign, the antitrust agencies undertook over 100 enforcement actions that resulted in compulsory licensing orders, principally during the 1950s and 1960s, and in many cases directed at the patent portfolios of some of the largest U.S. corporations.[38] In 1968, a White House Task Force on Antitrust Policy issued a report stating that "[p]atents are one of the principal sources of monopoly power" and recommended legislation providing that, with limited exceptions, any patentee who chooses to license a patent must do so on a nonexclusive basis and on the same terms to all interested parties.[39] The antitrust climate of the postwar decades was perhaps best illustrated by a now-infamous 1970 speech by a Department of Justice official, who identified a medley of vertical licensing practices—the so-called "Nine No-Nos"—that stood at high risk of legal condemnation under per se liability standards.[40] Unsurprisingly the market took heed. Writing in 1980, Douglas Ginsburg observed that, as a result of these enforcement policies, the use of resale price maintenance, field-of-use limitations, and exclusive grant-back clauses in patent licenses "appears effectively to have come to a halt."[41]

It was approximately at this point that the legal cloud of antitrust liability over IP licensing began to dissipate substantially, largely as a result of the Court's remaking of antitrust law with respect to vertical restraints generally. These changes substantially tracked arguments that had been made by scholars who had critiqued the per se treatment of certain IP licensing practices as well as the broad application of the patent misuse doctrine.[42] Starting in 1977

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patent misuse); Columbus Auto. Corp. v. Oldberg Mfg. Co., 264 F. Supp. 779, 785–86 (D. Colo. 1967) (finding patent misuse due to exclusive manufacture and distribution provision).

37. United States v. Loew's Inc., 371 U.S. 38, 46 (1962) (emphasis added).

38. For a comprehensive account, see Barnett, *Patent Grab*, *supra* note 28.

39. REPORT OF THE WHITE HOUSE TASK FORCE ON ANTITRUST POLICY (1968), *reprinted in* 91 CONG. REC. 13,891, 13,903 (1969).

40. Bruce P. Wilson, Special Assistant to Assistant Att'y Gen., Antitrust Div., U.S. Dept. of Just., Patent and Know-How License Arrangements: Field of Use, Territorial, Price and Quantity Restrictions, Remarks at the Fourth New England Antitrust Conference (Nov. 6, 1970) (on file with U.S. Dep't of Just.).

41. DOUGLAS H. GINSBURG, ANTITRUST, UNCERTAINTY, AND TECHNOLOGICAL INNOVATION 31 (1980).

42. For leading contributions, see WARD S. BOWMAN, JR., PATENT AND ANTITRUST LAW: A LEGAL AND ECONOMIC APPRAISAL (1973) (providing a critique of court decisions applying antitrust law and patent misuse doctrine to patent licensing since passage of the Clayton

with the so-called *Fortner II* decision, which rejected a tying claim for lack of proof of market power,[43] and the landmark decision, *Continental T.V., Inc. v. GTE Sylvania*, which rejected the per se treatment of all non-price vertical restraints,[44] the Court issued a sequence of decisions that removed or substantially qualified the per se, or quasi per se, rules of antitrust liability that had applied to vertical restraints. The Court's 1984 decision in *Jefferson Parish Hospital District No. 2 v. Hyde*[45] illustrates this nuanced approach. In distinct contrast to the formalist approach illustrated by the *Morton Salt* decision in 1942, in which the Court had dispensed with the necessity of showing anticompetitive effect, the *Jefferson Parish* decision adopted a "modified" per se rule, which requires that plaintiffs demonstrate both market power in the tying product market and an unreasonable restraint on competition in the tied product market.[46] In 2006, the Court summed up this intellectual turnaround, stating that "tying arrangements involving patented products should be evaluated under the standards applied in cases like *Fortner II* and *Jefferson Parish* rather than under the *per se* rule applied in *Morton Salt* and *Loew's*."[47] In 2001, the D.C. Circuit went further in *United States v. Microsoft*, holding that *Jefferson Parish* implied that only "certain" restraints were subject to even this modified per se rule.[48] This meant that all other tying practices were subject to a more demanding rule-of-reason analysis that, even if anticompetitive effects were shown, would consider offsetting efficiency justifications and then determine whether the contested practice was anticompetitive "on net." As of 2006, a leading treatise appropriately observed that "the per se rule against tying was 'per se' in name only."[49]

Within less than a decade, scholarly doubts about the wisdom of per se liability rules in antitrust law's treatment of IP licensing had moved from the periphery to the mainstream of legal thinking and, more importantly, had been embraced by the federal courts and enforcement agencies. If antitrust law is viewed in conjunction with patent law, this change in trajectory most likely reflected not only the shift in the Supreme Court's approach toward antitrust law's treatment of vertical restraints generally but also a concurrent

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Act in 1917 and concluding that the courts have repeatedly overlooked the welfare-enhancing efficiencies that generally arise from licensing transactions); William F. Baxter, *Legal Restrictions on Exploitation of the Patent Monopoly: An Economic Analysis*, 76 YALE L.J. 267 (1966); Ward S. Bowman, Jr., *Tying Arrangements and the Leverage Problem*, 67 YALE L.J. 19 (1957).

43. U.S. Steel Corp. v. Fortner Enters., Inc., 429 U.S. 610, 613 (1977).

44. Cont'l T.V., Inc. v. GTE Sylvania Inc., 433 U.S. 36, 58 (1977).

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

46. *Id.* at 29 (stating that plaintiff has burden of proving that the alleged tie "unreasonably restrained competition").

47. Ill. Tool Works, Inc. v. Indep. Ink, Inc., 547 U.S. 28, 42 (2006).

48. United States v. Microsoft, 253 F.3d 34, 89 (D.C. Cir. 2001).

49. HERBERT HOVENKAMP ET AL., IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW 4–56 (3d ed. Supp. 2019).

shift in the Court's approach toward patents specifically. This shift was reflected by the Court's 1980 decision in *Diamond v. Chakrabarty*, in which the Court famously held that patentable subject matter includes "anything under the sun that is made by man."[50] This two-pronged move in both antitrust and patent law away from the IP skepticism of the postwar period simultaneously instituted a broad definition of patentable subject matter and a narrow definition of anticompetitive licensing practices. In 1983, William Baxter, the head of the Antitrust Division, and formerly one of the leading scholarly critics of antitrust law's formalist treatment of IP licensing,[51] endorsed this deferential approach toward IP licensors, stating: "To enable intellectual property owners to obtain the maximum legitimate rewards possible for their efforts, it is crucial that the courts carefully consider procompetitive benefits when evaluating the lawfulness of intellectual property licensing under the antitrust laws."[52] In 1986, the Court of Appeals for the Federal Circuit (the "Federal Circuit") raised the bar for showing patent misuse by referring to economic scholarship that IP licensing was generally pro-competitive and adopting the view that licensing practices should generally not be subject to per se liability.[53] In 1988, Congress partially codified this new approach by requiring a showing of market power for patent misuse claims directed at tying restraints.[54] This largely rendered moot the Court's 1942 decision in *Morton Salt*, which had eliminated the requirement of showing anticompetitive effect when asserting patent misuse.[55]

The shift in the legal treatment of IP licensing culminated, and was most explicitly set forth, in the 1995 Guidelines issued by the antitrust agencies. The 1995 Guidelines endorsed three key principles, in some cases going beyond contemporary case law, which then sometimes followed the lead of the 1995 Guidelines on those points. First, the Guidelines discarded the "IP = monopoly" equation by lifting the presumption that IP rights necessarily imply market power without supporting evidence.[56] This statement anticipated the Court's 2006 decision in *Illinois Tool Works, Inc. v. Independent Ink, Inc.*, which adopted the same principle.[57] Second, the Guidelines recognized that

50. Diamond v. Chakrabarty, 447 U.S. 303, 308 (1980).

51. *See* Baxter, *supra* note 42.

52. WILLIAM F. BAXTER, ANTITRUST LAW AND THE STIMULATION OF TECHNOLOGICAL INVENTION AND INNOVATION (1983), https://www.justice.gov/atr/speech/file/1237501/download.

53. Windsurfing Int'l, Inc. v. AMF, Inc., 782 F.2d 995, 1001–02, 1001 n.9 (Fed. Cir. 1986) (observing that "economic analysis questions the rationale behind holding any licensing practice per se anticompetitive"); Princo Corp. v. Int'l Trade Comm'n, 616 F.3d 1318, 1329 (Fed. Cir. 2010) (reaffirming the "narrow scope of the [patent misuse] doctrine").

54. Patent Misuse Reform Act of 1988, 35 U.S.C. § 271(d)(5). In 2005, the Federal Circuit relied on this statute in holding that a patent misuse claim concerning tying required a showing of market power. *See* U.S. Phillips Corp. v. Int'l Trade Comm'n, 424 F.3d 1179, 1185–86 (Fed. Cir. 2005).

55. *See supra* note 33 and accompanying text.

56. 1995 GUIDELINES, *supra* note 15, § 2.2.

57. Ill. Tool Works Inc. v. Indep. Ink, Inc.,547 U.S. 28, 45–46 (2006).

IP licensing generally yields efficiency gains and therefore concluded that antitrust challenges to licensing transactions must provide evidence of competitive harm under some form of the rule-of-reason standard.[58] On this point, the 1995 Guidelines were sometimes even less interventionist than federal case law, stating for example that the agencies would take into account offsetting "efficiency justifications"[59] for tying practices, which goes somewhat beyond the modified per se rule the Supreme Court had adopted in *Jefferson Parish*.[60] In this respect, the agencies anticipated subsequent decisions in this direction by some lower courts, which, as described above,[61] contemplate that tying analysis may in some cases consider efficiency justifications as in a full-blown rule-of-reason analysis.[62] Third, the 1995 Guidelines reaffirmed that IP licensing arrangements can give rise to net anti-competitive effects in certain circumstances, especially in horizontal arrangements involving competitors; however, even in that case and especially with respect to IP pooling arrangements, the 1995 Guidelines cautioned against reflexive application of per se liability rules.[63] During this period, beginning with the landmark *Sylvania* decision in 1977,[64] and culminating in the issuance of the 1995 Guidelines, all three branches of government were moving towards a grand rationalization of the legal treatment of IP licensing—both under antitrust law and the doctrine of patent misuse—under the conceptual umbrella of economic efficiency.

B. *Judicial Dogmatism Revived*

In this Section, I show how federal case law addressing IP licensing, especially case law that is grounded in patent and copyright law rather than antitrust law, has increasingly reverted to a formalist mode of analysis that applies certain limitations on licensing practices with little substantive

58. 1995 GUIDELINES, *supra* note 15, § 3.4 ("In the vast majority of cases, restraints in intellectual property licensing arrangements are evaluated under the rule of reason."). In antitrust law, a rule-of-reason analysis requires that courts balance the competitive harms against the competitive gains reasonably attributable to a particular contested practice. For a summary of the case law relating to this concept, see Herbert J. Hovenkamp, *The Rule of Reason*, 70 FLA. L. REV. 81 (2018).

59. 1995 GUIDELINES, *supra* note 15, § 5.3.

60. For further discussion, see *supra* note 46 and accompanying text.

61. *See supra* note 48 and accompanying text.

62. Antitrust law provides courts with discretion in determining the appropriate level of inquiry required in balancing pro- and anti-competitive effects of a contested business practice within the rule-of-reason framework, which generally depends on a preliminary evaluation of the likelihood that a particular practice would ultimately be deemed anti-competitive on net. For the leading precedent on this point, see California Dental Ass'n v. Fed. Trade Comm'n, 526 U.S. 756, 779–81 (1999) (stating that there is a "sliding scale" of the level of inquiry necessitated by the rule of reason, which will depend on the likelihood that a particular type of restraint is anticompetitive on net).

63. 1995 GUIDELINES, *supra* note 15, §§ 3.4, 5.1, 5.5.

64. *See supra* note 44.

consideration of whether any particular practice is likely to give rise to anti-competitive effects. This stands in contrast to steps taken by Congress, the Federal Circuit, and the antitrust agencies during the 1980s and 1990s to align outcomes under patent misuse doctrine with outcomes under applicable antitrust law. Placed in a historical perspective, the Court's formalist turn represents a reversion in part to the reflexive IP-skepticism that characterized New Deal and postwar antitrust thinking, although it has been largely operationalized through patent and copyright law rather than antitrust law. To illustrate this development, I focus on the reasoning behind the Court's 2017 decision in *Impression Products, Inc. v. Lexmark International, Inc.*,[65] which broadly applied the judge-made doctrine of patent exhaustion in a manner akin to a per se-style of antitrust reasoning.

1. General Tendencies

It is widely observed that the Supreme Court has adopted a highly skeptical view of patents since approximately the mid-2000s, regularly striking down decisions by the Federal Circuit that had bolstered protections for patent holders.[66] Much of the scholarly and policy discussion concerning the Supreme Court's patent jurisprudence has focused on headline decisions that have either limited patent holders' remedies, most notably the Court's 2006 decision in *eBay, Inc. v. MercExchange LLC* restricting the availability of injunctive relief,[67] or cast doubt on the validity of broad categories of patents relating to software-related inventions, certain genetic material, and certain medical diagnostic methods.[68] Comparatively, little attention has been paid to lower-profile decisions that have cast doubt on certain types of IP licensing, sales, and other transactions. Since 2006, the Supreme Court has issued six precedential decisions relating to IP transactions, of which five upheld or bolstered constraints on IP owners' freedom of action.[69] These decisions are summarized in the Table below.

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65. Impression Prods., Inc. v. Lexmark Int'l, Inc., 137 S. Ct. 1523 (2017).

66. For discussion of these tendencies, see Maureen K. Ohlhausen, *Patent Rights in a Climate of Intellectual Property Rights Skepticism*, 30 HARV. J.L. & TECH. 103, 107–08 (2016).

67. eBay Inc. v. MercExchange, LLC, 547 U.S. 388, 394 (2006).

68. Respectively, these decisions are: Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208 (2014) (software); Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576 (2013) (genetic material); Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc. 566 U.S. 66 (2012) (medical diagnostic products).

69. The qualifier, "precedential," excludes Costco Wholesale Corp. v. Omega S.A., 562 U.S. 40 (2010), which was a split 4-4 decision and therefore did not have precedential impact. In 2019, the Court issued an opinion in a case involving the treatment of a trademark license in bankruptcy, Mission Prod. Holdings, Inc. v. Tempnology, LLC, 139 S. Ct. 1652 (2019). I omit this case since it principally concerns bankruptcy, rather than IP-related, issues.

TABLE 1. SUPREME COURT DECISIONS RELATING TO IP LICENSING (2006-PRESENT)

Year	Decision	Key Holding	Limits Transactional Freedom?
2006	*Medimmune, Inc. v. Genentech, Inc.*[70]	Licensee in good standing may challenge the validity of a licensed patent. Casts substantial doubt on enforceability of covenants not to sue.	Yes
2008	*Quanta Computer, Inc. v. LG Electronics, Inc.*[71]	Reaffirms that patent exhaustion bars enforcement of use restrictions against subsequent purchasers (in case where restrictions were set forth in a document ancillary to the license agreement).	Yes
2013	*Kirtsaeng v. John Wiley & Sons, Inc.*[72]	First sale doctrine (copyright exhaustion) applies to sales outside the United States.	Yes
2013	*Bowman v. Monsanto Co.*[73]	Patent exhaustion does not permit subsequent purchaser to make unauthorized copies of patented product.	No
2015	*Kimble v. Marvel Entertainment, LLC*[74]	Patent license is unenforceable beyond statutory term.	Yes
2017	*Impression Products, Inc. v. Lexmark Int'l, Inc.*[75]	Patent exhaustion applies to conditional sales and applies outside the United States.	Yes

These decisions generally adopt a formalist approach that favors literalist applications of patent and copyright law doctrines designed to limit over-reaching by IP licensors, as distinguished from a functionalist approach that relies principally on the policy rationales behind these doctrines and requires case-specific evidence of adverse net welfare effects. In antitrust terms, these decisions tend to exhibit reasoning that is closer to per se rules than rule-of-reason standards for determining liability, which inherently raises the risk of suppressing innocuous or pro-competitive practices. This may derive from the Court's skeptical approach toward patents as reflected in its decisions since the mid-2000s, as noted above.[76] As a practical matter, the application

70. MedImmune, Inc. v. Genentech, Inc. 549 U.S. 118, 137 (2007).
71. Quanta Comput., Inc. v. LG Elecs., Inc., 553 U.S. 617, 621 (2008).
72. Kirtsaeng v. John Wiley & Sons, Inc., 568 U.S. 519, 525 (2013).
73. Bowman v. Monsanto Co., 569 U.S. 278, 280 (2013).
74. Kimble v. Marvel Ent., LLC, 576 U.S. 446, 449 (2015).
75. Impression Prods., Inc. v. Lexmark Int'l, Inc., 137 S. Ct. 1523 (2017).
76. *See supra* notes 67–68 and accompanying text.

of per se-style reasoning through patent and copyright law doctrines supplies a strategic device that effectively enables any patent-skeptical coalition of Supreme Court Justices to detour around the more demanding rule-of-reason standard that governing antitrust law precedents would apply to the same practice.

2. Illustration: Impression Products, Inc. v. Lexmark International, Inc.

These formalist tendencies and associated false positive error risks are illustrated by the Court's 2017 decision in *Impression Products, Inc. v. Lexmark International, Inc.*,[77] which addressed the scope of the "patent exhaustion" doctrine. The plaintiff Lexmark, a leading manufacturer of printer cartridges, sold two types of cartridges: (i) a higher-priced cartridge that could be refilled and reused without restriction; and (ii) a lower-priced cartridge that was sold with contractual restrictions that barred reuse or transfer to another party.[78] The price differential naturally reflected the extent of any limitations on the buyer's use of the purchased cartridge. Despite being aware of those contractual restrictions, the defendant Impression Products purchased the lower-priced cartridges from other buyers, refilled them and resold them—a classic arbitrage strategy that threatened Lexmark's two-tier price discrimination strategy.[79]

The Court refused to uphold enforcement of the contractual restrictions on re-use of the lower-priced cartridges, on the ground that the initial sale of the cartridges had triggered exhaustion of the underlying patents and therefore, as a matter of patent law, those restrictions had no legal force against subsequent users like the defendant.[80] Given the lack of privity between the patent owner and the defendant, who had not purchased cartridges directly from Lexmark, no cause of action for breach of contract was available. Consistent with a per se-style analysis, the Court did not engage in any inquiry to ascertain whether the patent owner exercised market power, whether the use restrictions were made sufficiently clear to subsequent purchasers (in which case the pricing would have presumably reflected those restrictions), or whether the use restrictions resulted in net negative welfare effects.[81] As

77. *See Impression Prods.*, 137 S. Ct. Some of the discussion that follows draws on more extended arguments in an amicus brief on which I was a co-lead author. *See* Brief for 44 Law, Econ. and Bus. Professors as Amici Curiae Supporting Respondent, *Impression Prods.*, 137 S. Ct. (No. 15-1189).

78. *Impression Prods.*, 137 S. Ct. at 1529–30.

79. *Id.* at 1530.

80. *Id.* at 1531–33.

81. See Herbert J. Hovenkamp, *Reasonable Patent Exhaustion*, 35 YALE J. REGUL. 513 (2018) [hereinafter Hovenkamp, *Reasonable Patent Exhaustion*], for a similar view of the *Impression Products* decision as having promulgated the equivalent of a per se approach to use restrictions in the sale of patented assets. See Herbert J. Hovenkamp, *Post-Sale Restraints and Competitive Harm: The First Sale Doctrine in Perspective*, 66 N.Y.U. ANN. SURV. AM. L. 487

Herbert Hovenkamp has observed, Lexmark's market share was too small to support any plausible assertion of market power, in which case the use restrictions could not plausibly have caused competitive harm, for the simple reason that any customer who did not like Lexmark's terms could have moved to one of its competitors in search of a better deal.[82]

The Court's decision overturned a long-standing Federal Circuit interpretation of patent exhaustion doctrine, *Mallinckrodt, Inc. v. Medipart, Inc.*[83] That decision had adopted a more complex but nuanced standard that distinguished between unconditional and conditional sales. Under that standard, patent exhaustion was only triggered in the case of unconditional sales, a principle that effectively enabled patentees to "waive" the exhaustion doctrine by entering into a conditional sale subject to use restrictions, provided sufficient notice was given of any such restrictions.[84] The Federal Circuit's interpretation of the exhaustion doctrine as a waivable presumption provided patent licensors and licensees with the freedom to negotiate a wide range of transactional structures in technology markets without the risk of triggering exhaustion. More generally, this deferential approach reflected the fact that, as an economic matter, there is nothing intrinsically objectionable about placing a restriction on the use of an IP asset, so long as the restriction is made known to the purchaser and therefore reflected in the market pricing. Additionally, the IP holder's ability to specify enforceable use restrictions enables it to offer users a menu of differently priced consumption bundles, which can yield both efficient and progressive welfare effects by expanding access for lower-valuation and lower-income consumers.[85] As illustrated by the *Impression Products* case, it could be perfectly rational for a buyer to accept restrictions on use in exchange for a commensurate discount—just as a car lessee may accept a stricter limit on mileage in exchange for a lower monthly payment.

The Court's interpretation of the exhaustion doctrine relied heavily on the common-law rule against "restraints on the alienation of chattels," as

(2011), for similar views concerning the Court's application of the patent exhaustion doctrine in the earlier *Quanta v. LG* decision.

82. Hovenkamp, *Reasonable Patent Exhaustion*, *supra* note 81, at 518–19.

83. Mallinckrodt, Inc. v. Medipart, Inc., 976 F.2d 700 (Fed. Cir. 1992). The *Mallinckrodt* decision had already been placed in some doubt by the Court's ruling in Quanta Computer, Inc. v. LG Electronics, Inc., 553 U.S. 617 (2008), which had affirmed that the patent exhaustion doctrine applies to method patents and combination products of which the patented component is only a part. However, the Court's decision in *Quanta* left open the possibility that a conditional sale might not trigger exhaustion if the patentee provided sufficient notice of applicable use restrictions to the initial purchaser.

84. *Mallinckrodt*, 976 F.2d at 706–09. For a similar subsequent decision, see B. Braun Med., Inc. v. Abbott Lab'ys, 124 F.3d 1419, 1426–27 (Fed. Cir. 1997) (holding that only an unconditional sale triggers patent exhaustion).

85. See Olena Ivus, Edwin L.-C. Lai & Ted Sichelman, *An Economic Model of Patent Exhaustion*, 29 J. ECON. & MGMT. STRATEGY 816 (2020), for a formal model showing that the ability to waive patent exhaustion enables the IP holder to engage in welfare-enhancing price discrimination.

reflected by its assertion that "Congress . . . has repeatedly revised the Patent Act against the backdrop of this hostility toward restraints on alienation."[86] Several commentators, as well as the Federal Circuit in its opinion in *Impression Products* case,[87] have rejected the assertion that this common-law principle has ever been adopted by U.S. patent law or have provided evidence that the common-law principle was applied subject to various exceptions.[88] Notwithstanding these open historical and doctrinal questions, the practical consequence of the Court's unqualified interpretation of the exhaustion doctrine is clear. Barring contractual workarounds[89] or technological means by which to regulate and meter usage, the Court's rejection of the distinction between conditional and unconditional sales compels manufacturers such as Lexmark to offer a single uniform price to all buyers at the point of first sale. While this may lower the price that would have been paid by higher-intensity users who had typically purchased the full-use version, it most likely increases prices for lower-intensity users, who can no longer purchase the discounted restricted-use product. The effects of this distortion may be both inefficient, reducing innovation incentives by reducing total expected returns under a compelled uniform-pricing regime, and regressive, shifting wealth from lower-income to higher-income consumers.

The Court's decision in *Impression Products* represented a significant departure from well-established legal understandings and market practice, in place at least since the *Mallinckrodt* decision in 1992.[90] In 2010, the Federal

86. Impression Prods., Inc. v. Lexmark Int'l, Inc., 137 S. Ct. 1523, 1526 (2017).

87. Lexmark Int'l, Inc. v. Impression Prods., Inc., 816 F.3d 721, 750–52 (Fed. Cir. 2016).

88. For a review of these arguments, and extensive additional evidence further supporting this position, see Sean M. O'Connor, *The Damaging Myth of Patent Exhaustion*, 28 TEX. INTELL. PROP. L.J. 443 (2020); *see also* John F. Duffy and Richard Hynes, *Statutory Domain and the Commercial Law of Intellectual Property*, 102 VA. L. REV. 1, 52 (2016) (arguing that Coke's articulation of the common law rule against restraints on the alienation of chattels only applied to unconditional transfers).

89. It is possible that patentees could circumvent the exhaustion obstacle to some extent by requiring that any subsequent purchaser enter into a contractual relationship with the patentee or restructure the initial sale relationship as a license or lease. For discussion, see SULLIVAN & CROMWELL LLP, SUPREME COURT SETS NEW RULES FOR PATENT EXHAUSTION DOCTRINE (2017), https://www.sullcrom.com/siteFiles/Publications/SC_Publication_Supreme_Court_Sets_New_Rules_for_Patent_Exhaustion_Doctrine.pdf. Both strategies, however, suffer from significant limitations. In the first case, the patentee relies as a practical matter on the willingness of the initial purchaser to enforce contractual conditions against subsequent purchasers, which may be difficult to enforce. In the second case, lease or license arrangements may not be practically feasible in the case of certain (especially, physical) goods or may be less efficient as compared to a sale arrangement.

90. The line of argument pursued in *Mallinckrodt* could be dated substantially earlier. In *Gen. Talking Pictures v. W. Elec. Co.*, 304 U.S. 175 (1938), *aff'd on reh'g*, 305 U.S. 124 (1938), the Court upheld enforcement against a downstream purchaser of use restrictions set forth in the agreement with the initial licensee, on the ground that the restrictions were notified to the licensee and the subsequent purchaser was aware of those restrictions. Even earlier, the Court had held that patent exhaustion applied to cases where "the sale is absolute, and without any

Circuit had succinctly described this understanding: "[E]xpress conditions accompanying the sale or license of a patented product . . . are generally upheld."[91] Taking exception to this deferential approach, some legal scholars have argued that a non-waivable interpretation of the exhaustion doctrine is vital to protect IP markets from an impenetrable web of use restrictions that would generate uncertainty and unduly burden end-users and intermediate users.[92] At least in theory, this is a legitimate concern: sufficiently high transaction costs could, in some circumstances, overwhelm the efficiency gains and distributive effects secured through the broader menu of pricing strategies available under a free-contracting regime. However, this concern remains largely theoretical given the absence of any empirical evidence that IT markets were harmed by judicial deference to private contracting during the over two-decade period that had elapsed since the *Mallinckrodt* decision, and the even longer pre-*Mallinckrodt* period during which courts inconsistently applied the exhaustion doctrine in determining whether to uphold use restrictions in the case of conditional sales, subject generally to a notice requirement.[93] If anything, available evidence points in the opposite direction: the period during which the *Mallinckrodt* decision held sway coincides with the disaggregation of supply chains, output expansion, high rates of consumer adoption, and a decline in quality-adjusted prices in consumer electronics markets.[94] This increased transactional complexity, and the cost-efficiencies arising from the specialization of labor across global technology markets, relied in part on the ability of IP asset holders to use licenses and other contractual instruments to finely regulate the use of informational assets at each step of the supply chain.

In the world after *Impression Products*, these intricate structures operate under considerable uncertainty. Even use restrictions that are made explicit to a sophisticated intermediate user at the point of sale, and then again made

conditions." Mitchell v. Hawley, 83 U.S. 544, 548 (1872) (suggesting that it does not apply in the case of a conditional sale).

91. Princo Corp. v. Int'l Trade Comm'n, 616 F.3d 1318, 1328 (Fed. Cir. 2010).

92. *See, e.g.*, Molly Shaffer Van Houweling, *The New Servitudes*, 96 GEO. L.J. 885, 932–46 (2008). For a somewhat more attenuated position, see Ariel Katz, *The First Sale Doctrine and the Economics of Post-Sale Restraints*, 2014 B.Y.U. L. REV. 55, 63 (2014) (arguing that contractual waivers of the exhaustion doctrine should generally be held invalid "in the absence of a compelling case-specific explanation as to why the work around should be upheld"). For a more aggressive position, see Aaron Perzanowski & Jason Schultz, *Digital Exhaustion*, 58 UCLA L. REV. 889, 892 (2011) (recognizing that the first sale doctrine is motivated by concerns about transaction-cost obstacles to commerce in copyright-protected goods but arguing that the doctrine should be extended to encompass the derivative right).

93. For discussion of this case law, see Hovenkamp, *Reasonable Patent Exhaustion*, *supra* note 81, at 521.

94. Jason Dedrick & Kenneth L. Kraemer, *Personal Computing*, *in* INNOVATION IN GLOBAL INDUSTRIES: U.S. FIRMS COMPETING IN A NEW WORLD 19, 23, 41–42 (Jeffrey T. Macher & David C. Mowery eds., 2008). For pricing data, see Alexander Galetovic et al., *An Empirical Examination of Patent Holdup*, 11 J. COMPETITION L. & ECON. 549, 564–65 (2015).

explicit to subsequent users in the relevant supply chain (and therefore priced into each transaction), will no longer be upheld as a matter of patent law, and, given the absence of privity, could not be enforced as a matter of contract law against subsequent users.[95] A non-waivable application of patent exhaustion inherently truncates the range of feasible pricing and distribution strategies available to IP holders, which may in turn have adverse effects from a competition policy perspective. If licensing is not feasible, then IP holders must select from two remaining monetization strategies: (i) extract all available economic surplus at a single point of sale on the supply chain, potentially exacerbating the deadweight losses inherent to IP protection, or, to the extent an IP holder has the requisite capital and technical expertise, (ii) vertically integrate forward and extract economic surplus by embedding the technology in a product or service for the target market. In a post-*Impression Products* legal environment, an IP owner faces a limited range of transactional options and may be compelled to select a less than optimal monetization strategy, which in turn may increase input costs for intermediate users and raise prices for at least some end-users. As I will discuss subsequently,[96] this risk of transactional distortion, and associated efficiency losses, necessarily arises under any legal regime that places limits on the licensing freedom of IP owners.

C. *Regulatory Anti-Empiricism*

Since approximately the mid-2000s, competition law enforcers around the world (with the exception of the DOJ from November 2017 through January 2021[97]), have ambitiously sought to rewrite the rules that govern the

95. It might be objected that, in circumstances in which an IP holder enjoys market power (which is far from the universal case, see *infra* Part IV.A), it may impose use restrictions that raise entry barriers and obstruct competition on the merits (for example, resale restrictions that impede the development of secondary markets), which would represent a negative externality for the market as a whole that would not be reflected in individual sale/purchase transactions. In that case, however, the tools of antitrust law would be available to address this type of practice (which may in some cases have offsetting efficiency justifications) in a more surgical manner than a wholesale ban on use restrictions through nonwaivable application of the exhaustion doctrine.

96. *See infra* Part IV.C.

97. In November 2017, DOJ Antitrust announced a shift in policy relating to the antitrust treatment of standard-essential patents. Makan Delrahim, Assistant Att'y Gen., Antitrust Div., U.S. Dep't of Just., Remarks at the USC School of Law's Center for Transnational Law and Business Conference (Nov. 10, 2017) (on file with U.S. Dep't of Just.). This position was reiterated by DOJ Antitrust in December 2019 in a joint statement with the U.S. Patent & Trademark Office and the National Institute of Standards & Technology. *See* U.S. DEP'T OF JUST., U.S. PAT. & TRADEMARK OFF. & NAT'L INST. OF STANDARDS & TECH., POLICY STATEMENT ON REMEDIES FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS (2019), https://www.justice.gov/atr/page/file/1228016/download. It now appears that DOJ Antitrust is likely to retract or modify the views expressed in the 2019 joint statement. The executive order issued in July 2021 by President Biden asks the DOJ and Department of Commerce to consider "whether to revise their position on the intersection of the intellectual property and antitrust laws, including by considering whether to revise the" 2019

licensing infrastructure of the global smartphone market. Such a far-reaching policy objective inherently carries the risk of significant error costs. Remarkably, this regulatory campaign has been premised on almost entirely theoretical propositions, rather than empirical evidence. Anchored in a handful of papers published by scholars in the early and mid-2000s,[98] competition regulators have expressed concern that the high numbers and dispersed ownership of "standard-essential" patents ("SEPs") in the smartphone and related IT markets may give rise to two forms of opportunistic behavior: (i) "patent holdup," in which SEP owners demand exorbitant royalties from producers that have made "relationship-specific" investments in the relevant technology standard, and (ii) "royalty stacking," a variant of the double marginalization problem[99] in which uncoordinated rate-setting by monopolist patentees imposes an aggregate royalty burden that inflates device prices above collectively revenue-maximizing levels.[100] Making reference to the "license-as-tax" analogy, some of these scholarly contributions suggested that these risks had already been realized, stating that SEP licensors impose a "tax on new products incorporating the patented technology, thereby impeding rather than promoting innovation."[101]

These theoretical assertions have had significant practical impact, translating into regulatory and judicial actions that have limited, or seek to limit, significantly the enforcement and licensing capacities of SEP owners that are the principal sources of technology inputs for the smartphone market. Remarkably, as I discuss below, all subsequently published empirical studies have found that these models do not accurately predict the actual performance

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joint statement. *See* Executive Order No. 14036, Promoting Competition in the American Economy, 86 Fed. Reg. 36987 (July 9, 2021), https://www.govinfo.gov/content/pkg/FR-2021-07-14/pdf/2021-15069.pdf.

98. *See, e.g.*, Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2013–16 (2007); Mark A. Lemley, *Ten Things to Do About Patent Holdup of Standards (and One* Not *To)*, 48 B.C. L. REV. 149, 152 (2007); Joseph Farrell, John Hayes, Carl Shapiro & Theresa Sullivan, *Standard Setting, Patents, and Hold-Up*, 74 ANTITRUST L.J. 603, 607–08 (2007); Daniel G. Swanson & William J. Baumol, *Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power*, 73 ANTITRUST L.J. 1, 19–21 (2005); Shapiro, *supra* note 2, at 125–26. For a detailed account of the genealogy of scholarly publications that have provided the intellectual underpinnings behind regulatory interventions in SEP markets, see Jonathan M. Barnett, *Has the Academy Led Patent Law Astray?*, 32 BERKELEY TECH. L.J. 1313, 1316, 1324–28, 1345–46 (2017) [hereinafter Barnett, *Has the Academy*]. There is also a follow-on theoretical literature that refines or critiques the models set forth in these initial contributions. For a helpful review, see Norman V. Siebrasse, *Holdup, Holdout, and Royalty Stacking: A Review of the Literature*, *in* PATENT REMEDIES AND COMPLEX PRODUCTS: TOWARD A GLOBAL CONSENSUS 239 (C. Bradford Biddle et al. eds., 2019).

99. For the standard source, see AUGUSTE COURNOT, RESEARCHES INTO THE MATHEMATICAL PRINCIPLES OF THE THEORY OF WEALTH 99–116 (Nathaniel. T. Bacon, trans., The Macmillan Company 1897) (1838).

100. *See supra* note 98.

101. Lemley & Shapiro, *supra* note 98, at 1993.

of the real-world smartphone market. Even more remarkably, competition regulators, with the recent exception of DOJ Antitrust, have not reversed or deviated significantly from the existing policy trajectory.

1. "Standard-Essential" Patent Antitrust: Policy Objectives

Antitrust agencies in the United States and other commercially significant jurisdictions have devoted significant resources to scrutinizing and, in some cases, taking action against the long-standing licensing practices of lead SEP holders, which are among the lead innovators,[102] in the smartphone industry. In particular, these agencies have advocated, and some courts in these jurisdictions have implemented, to varying degrees, three key principles that significantly limit SEP holders' enforcement and licensing capacities. As explained below,[103] the last principle has principally been pursued by one of China's competition regulators. Given limitations of space, the discussion below is representative rather than exhaustive.[104]

Principle I: SEP owners are not entitled to injunctive relief against infringers.

U.S. courts have effectively adopted this principle, holding that SEP owners generally are not entitled to injunctive relief, unless an infringing user is unwilling to enter into a license on terms that comply with the SEP owner's commitment to offer "fair, reasonable and nondiscriminatory" ("FRAND") terms.[105] In at least two cases, courts have awarded attorneys' fees to the infringer because the SEP owner was found to have pursued injunctive relief in circumstances inconsistent with its FRAND commitment.[106] Additionally, the FTC conditioned approval of a major acquisition involving a large SEP portfolio—Google's 2012 acquisition of Motorola Mobility—on a commitment by the acquiring firm not to pursue injunctive relief against infringers of the target's SEP portfolio.[107] Similarly, DOJ Antitrust encouraged

102. For discussion of the innovation activities of lead SEP owners in the smartphone industry, see Jonathan M. Barnett, *Antitrust Overreach: Undoing Cooperative Standardization in the Digital Economy*, 25 MICH. TECH. L. REV. 163, 197 (2019) [hereinafter Barnett, *Antitrust Overreach*] (showing that leading owners of 5G-related SEPs also lead in R&D intensities and percentage of submissions to the 5G SSO process).

103. *See infra* notes 130–135.

104. For a fuller discussion, see Barnett, *Antitrust Overreach*, *supra* note 102.

105. *See, e.g.*, Apple, Inc. v. Motorola, Inc., 757 F.3d 1286, 1332 (Fed. Cir. 2014) (rejecting no-injunction principle but holding that a SEP owner is only entitled to seek injunctive relief if the infringer exhibited unwillingness to enter into a FRAND-compliant license).

106. Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024, 1049–52 (9th Cir. 2015); Apple, Inc. v. Motorola, Inc., 869 F. Supp. 2d 901, 913–15 (N.D. Ill. 2012), *modified on other grounds*, 757 F.3d 1286 (Fed. Cir. 2014).

107. *Google Agrees to Change Its Business Practices to Resolve FTC Competition Concerns in the Markets for Devices Like Smart Phones, Games and Tablets, and in Online Search*,

standard-setting organizations ("SSOs") to bar contributors from pursuing injunctions as part of the FRAND commitment that is typically undertaken by firms that contribute technology to a standard.[108] Following this invitation, a leading SSO, the IEEE, largely adopted this principle with respect to the 802.11 WiFi standard,[109] after having received a favorable "business review letter" on this point from DOJ Antitrust.[110]

U.S. antitrust agencies' efforts on this point have been mirrored, with some differences, by courts and regulators in other major jurisdictions. In the UK, the European Union, and Germany, courts have adopted somewhat more attenuated forms of the "almost-no-injunction" rule, placing more emphasis on the infringing user's obligation to negotiate in good faith in order to enjoy effective immunity from the threat of injunctive relief.[111] While these decisions theoretically entitle a SEP owner to seek injunctive relief in a greater range of qualifying circumstances, in which the infringer does not negotiate in good faith and is therefore deemed to be an "unwilling licensee," the practical importance of the UK, European, and German courts' approach may be somewhat limited to the extent a well-advised infringing user can easily comply with this good-faith standard even in a drawn-out negotiation process. In China, similar principles have been adopted and SEP holders that have sought injunctive relief have generally been unsuccessful in doing so and, in some cases, have even triggered antitrust counterclaims by the infringing party.[112]

FED. TRADE COMM'N (Jan. 3, 2013), https://www.ftc.gov/news-events/press-releases/2013/01/google-agrees-change-its-business-practices-resolve-ftc.

108. Renata Hesse, Deputy Assistant Att'y Gen., Antitrust Div., U.S. Dep't of Just., Remarks as Prepared for the ITU-T Patent Roundtable: Six "Small" Proposals for SSOs Before Lunch 9 (Oct. 10, 2012).

109. IEEE-SA STANDARDS BOARD BYLAWS §§ 6.1–6.2 (INST. ELECTRICAL & ELECTRONIC ENG'RS, INC. 2017).

110. Business Review Letter from Renata B. Hesse, Acting Assistant Att'y General, Antitrust Div., U.S. Dept. of Just., to Michael A. Lindsay, Esq., Dorsey & Whitney LLP (Feb. 2, 2015), https://www.justice.gov/atr/response-institute-electrical-and-electronics-engineers-incorporated. Note that the business review letter procedure enables a party to seek a statement by DOJ Antitrust concerning whether a proposed transaction is or is not likely to violate the antitrust laws. A favorable letter effectively operates as the equivalent of regulatory "pre-clearance" of the proposed transaction. For further explanation, see *What is a Business Review*, U.S. DEP'T OF JUST., https://www.justice.gov/atr/what-business-review (last updated June 25, 2015).

111. For the UK decisions, see Unwired Planet Int'l Ltd. v. Huawei Techs. Co. [2017] EWHC (Pat) 711 and Huawei Techs. Co. v. Conversant Wireless Licensing S.A.R.L. [2019] EWCA (Civ) 38. These cases were upheld in Unwired Planet Int'l Ltd. v. Huawei Techs. Co. and Conversant v. Huawei [2020] UKSC 37. For the EU decision, see Case C-170/13, Huawei Techs. Co. v. ZTE Corp., 2014 E.C.R. 477, ¶¶ 61–67. On the German decision, see Mathieu Klos, *Sisvel v. Haier: Federal Court Raises Bar for Implementers in SEP Disputes*, JUVE PATENT (Mar. 2, 2021), https://www.juve-patent.com/news-and-stories/cases/sisvel-vs-haier-federal-court-raises-bar-for-implementers-in-sep-disputes.

112. For a review of leading cases, see Jyh-An Lee, *Implementing the FRAND Standard in China*, 19 VAND. J. ENT. & TECH. L. 37, 62 (2016); D. Daniel Sokol & Wentong Zheng, *FRAND in China,* 22 TEX. INTELL. PROP. L.J. 71, 85–91 (2013).

Principle II: SEP owners must license at the component level, rather than the device level.

In the wireless communications industry, it has been long-standing practice for IP licensors to use the sale price of the device in the consumer market as the "base" on which the royalty rate is determined.[113] Starting in 2011, the FTC sought to overturn this practice, recommending that, in the case of multi-component technologies, courts determining reasonable royalties should select the "appropriate [royalty] base that . . . the parties would have chosen in the hypothetical negotiation . . . [which] may often be the smallest priceable [*sic*] component containing the invention."[114] In 2019, the district court in the *FTC v. Qualcomm* litigation adopted this view and stated that device-level, distinguished from component-level, licensing is "inconsistent with . . . Federal Circuit law on the smallest salable patent practicing unit"[115] (or "SSPPU"), implying that U.S. patent law had adopted Principle II. This is not accurate. In rejecting the district court's ruling on this point, the Ninth Circuit observed that "[n]o court has held that the SSPPU concept is a per se rule for 'reasonable royalty' calculations"[116] and that the Federal Circuit had rejected the proposition that "the SSPPU concept is *required* when calculating patent damages."[117] The Ninth Circuit further noted that the Federal Circuit had observed that firms "routinely" enter into license agreements based on the device's sale price and hence "there is nothing inherently wrong with using the market value of the entire product" in calculating infringement damages.[118] The court's observations are consistent with more systematic studies of applicable case law. Based on an exhaustive survey of district court litigation by David Kappos and Paul Michel through 2018,[119] it appears that courts have generally only mandated a component-level approach for the limited and prudential purpose of determining a "reasonable royalty" in patent infringement

113. *See* J. Gregory Sidak, *The Proper Royalty Base for Patent Damages*, 10 J. COMPETITION L. & ECON. 989, 993, 996 (2014).

114. FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 25 (2011).

115. *See* Fed. Trade Comm'n v. Qualcomm Inc., 411 F. Supp. 3d 658, 783 (N.D. Cal. 2019).

116. Fed. Trade Comm'n v. Qualcomm Inc., 969 F.3d 974, 998 (2020).

117. *Id.* at 999 (emphasis in original) (citing Commonwealth Sci. and Indus. Rsch. Org. v. Cisco Sys., Inc., 809 F.3d 1295, 1303 (Fed. Cir. 2015)); *see also* Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1226 (Fed. Cir. 2014). I note that the district court's ruling is also in tension with Supreme Court precedent holding that using the sale price as the royalty base in a patent license agreement is not patent misuse, so long as it reflects the "convenience of the parties rather than patent power." *See* Zenith Radio Corp. v. Hazeltine Rsch., Inc., 395 U.S. 100, 138 (1969).

118. *See Qualcomm Inc.*, 969 F.3d. at 999.

119. *See* David Kappos & Paul R. Michel, *The Smallest Salable Patent-Practicing Unit: Observations on Its Origins, Development, and Future*, 32 BERKELEY TECH. L.J. 1433 (2018).

litigation adjudicated by a jury,[120] which therefore does not encompass bench trials in which a judge determines damages or any other point of patent law.

While *Principle II* has not been adopted by courts as a mandatory rule of patent licensing, this does not preclude private entities from adopting it voluntarily. In 2016, the IEEE, the SSO that administers the 802.11 Wi-Fi standard, modified its definition of FRAND in a manner that arguably mandates or at least strongly encourages component-level licensing.[121] This rule change was undertaken following the same business review letter in which, as noted previously, DOJ Antitrust had endorsed the IEEE's adoption of a bar on SEP owners' seeking injunctions against infringers.[122] Specifically, the DOJ's business review letter had concluded that recommending the use of the SSPPU as the royalty base for setting a FRAND-compliant royalty is "not out of step with the direction of current U.S. law."[123] DOJ Antitrust's efforts to push the SEP licensing market towards component-level licensing appear to have had some effect outside the United States. In 2017, South Korea's competition regulator referenced the DOJ's business review letter in taking enforcement action concerning Qualcomm's allegedly anticompetitive licensing practices.[124] In its antitrust investigation and enforcement actions against Qualcomm, NDRC, one of China's competition regulators, had initially sought to compel Qualcomm to rewrite its licensing agreements with local device producers using the SSPPU, rather than the device price, as the royalty base. While the NDRC ultimately permitted Qualcomm to continue using the device price as the royalty base, the NDRC did ultimately achieve a significant reduction for local device producers on the royalty rate assessed against that base.[125]

Hence, even without formal action, the U.S. antitrust agencies achieved some limited success in rewriting the licensing "rules of the game" in the wireless device industry. In this case, this success was short-lived. The IEEE's revised patent policy elicited strong resistance from leading technology contributors, some of which either declined to submit the customary

120. The "prudential" reason is a concern that, in the case of a patent covering a component of a multi-component product, using the total price of the product as the royalty base in determining reasonable royalty damages in patent infringement litigation may lead an unsophisticated jury to award excessively high damages in absolute terms under the mistaken impression that the selected rate appears to be appropriate on a percentage basis. On this point, see Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d at 1227.

121. Specifically, the IEEE amended the FRAND commitment to provide that: (i) patentees are barred from assessing a royalty rate that reflects any value attributable to the inclusion of the relevant technology in the standard, and (ii) patentees "may" assess a reasonable royalty based upon the "smallest saleable" practicing unit. *See* IEEE-SA STANDARDS BOARD BYLAWS § 6.1 (INST. ELECTRICAL & ELECTRONIC ENG'RS, INC. ASS'N 2016).

122. *See supra* note 110.

123. Hesse, *supra* note 110.

124. Korea Fair Trade Comm'n, Decision No. 2017-0-025, In re Alleged Abuse of Market Dominance of Qualcomm Inc., ¶ 393 (Jan. 20, 2017).

125. ANGELA HUYUE ZHANG, CHINESE ANTITRUST EXCEPTIONALISM 29–31 (2021).

"letter of assurance" ("LOA"), undertaking a FRAND licensing commitment to IEEE in connection with declaring a patent essential to the standard, or submitting a "negative assurance" LOA explicitly rejecting any such commitment.[126] Specifically, between January 2016 and June 2019, seventy-seven percent of the LOAs submitted to IEEE in connection with the Wi-Fi standard were negative, marking a sharp deviation from historical practice in which such negative LOAs were rarely submitted.[127] Subsequently, in 2020, DOJ Antitrust took the exceptional step of "updating" its previously issued business review letter to clarify that the letter should not be interpreted to constitute an endorsement of IEEE's patent policies concerning the bar on seeking injunctions and the recommended use of SSPPU as the appropriate base in determining a FRAND-compliant royalty rate.[128] Finally, in early 2021, there appeared to be yet another policy shift under the new presidential administration: without formally retracting the 2020 "update," the DOJ moved the link to the update from the online archive of issued business review letters to a portion of the DOJ website dedicated to other matters, where the update is described merely as "comments to state and other organizations."[129]

Principle III: "Excessive" "Standard-Essential" Patent royalty rates can constitute an independent competition law violation.

This principle, which envisions the most aggressive intervention in SEP licensing markets, is not compatible with U.S. antitrust law and, while it is recognized under European Union competition law, is rarely applied.[130] By contrast, this principle is explicitly reflected in China's Anti-Monopoly Law, which recognizes "excessive pricing" as an independent basis for a competition law violation in the case of firms that hold a "dominant" market

126. Richard Lloyd, *Huawei Joins the IEEE Patent Refuseniks Four Years Since Controversial Policy Change*, IAM MEDIA (May 17, 2019), https://www.iam-media.com/frandseps/huawei-joins-ieee-patent-refuseniks-four-years-controversial-policy-change; David L. Cohen, *The IEEE 2015 Patent Policy–A Natural Experiment in Devaluing Technology*, KIDON IP (Aug. 12, 2019), https://www.kidonip.com/standard-essential-patents/the-ieee-2015-patent-policy-a-natural-experiment-in-devaluing-technology.

127. Cohen, *supra* note 126; David L. Cohen, *Wi-Fi Negative Letters of Assurance Contaminate and Compromise ISO 8802 Standards*, KIDON IP (Nov. 3, 2020), https://www.kidonip.com/standard-essential-patents/wi-fi-negative-letters-of-assurance-contaminate-and-compromise-iso-8802-standards.

128. Supplemental Letter from Makan Delrahim, Assistant Att'y Gen., U.S. Dep't of Just., to Sophia A. Muirhead, Gen. Couns. and Chief Compliance Officer, IEEE (Sept. 10, 2020), https://www.justice.gov/atr/page/file/1315291/download.

129. *DOJ Downgrades Delrahim Letter to IEEE on Standard-Essential Patents: Inter-Agency Rapprochement with FTC on SEP Enforcement*, FOSS PATENTS (Apr. 16, 2021), https://www.fosspatents.com/2021/04/doj-downgrades-delrahim-letter-to-ieee.html.

130. Koren W. Wong-Ervin et al., *Tying and Bundling Involving Standard-Essential Patents*, 24 GEO. MASON L. REV. 1091, 1093–94, 1104 (2017).

position.[131] On this basis, a Chinese court found in 2013 that a SEP owner, InterDigital Corporation, which had brought an infringement litigation against a local device producer, Huawei, was liable for assessing "excessive" royalties, which the court's order reset substantially downward for future licensing purposes.[132] In 2015, as noted previously, the NDRC, one of China's competition regulators, applied this principle in imposing a $975 million fine against Qualcomm and entered into a settlement that substantially reduced the royalty rates in its licensing relationships with local device producers.[133] In an idiosyncratic development, portions of the district court's opinion in the *FTC v. Qualcomm* litigation appeared to find an antitrust violation on the basis that the defendant's royalty rates were deemed to be "unreasonably high."[134] This is idiosyncratic since it seems to be a tacit endorsement of *Principle III,* which would be inconsistent with U.S. antitrust law's fundamental commitment to safeguarding the competitive conditions under which asset prices are determined through competitive market forces, as distinguished from making expert determinations as to whether any particular price is "too high." The Ninth Circuit appropriately rejected this portion of the district court's opinion, observing that the Supreme Court had specifically held that "the opportunity to charge monopoly prices 'is an important element of the free-market system' and 'is what attracts "business acumen" in the first place; it induces risk taking that produces innovation and economic growth.'"[135]

2. "Standard-Essential" Patent Antitrust: Policy Actions

The Table below sets forth a selected but representative set of actions or statements by leading regulators or courts that advance, or seek to advance, one or more of the three principles set forth above. These actions represent significant interventions in patent enforcement and licensing activities, including prohibitions on seeking injunctive relief against infringers, fines in the hundreds of millions of dollars, and, in a case brought by one of China's competition regulators, an explicit determination of the royalty rate that may be charged by the IP licensor.

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131. Anti-Monopoly Law of the People's Republic of China, art. 17(1) (prohibiting firms from "selling commodities at unfairly high prices").

132. Lee, *supra* note 112, at 50 (citing Huawei Tech. Co. v. InterDigital Commc'ns, 2013 Yue Gao Fa Min San Zhong Zi No. 306 (Guangdong High People's Ct. 2013) (China)).

133. *See* ZHANG, *supra* note 125; Noel Randewich & Matthew Miller, *Qualcomm to Pay $975 Million to Resolve China Antitrust Dispute*, REUTERS (Feb. 9, 2015), https://www.reuters.com/article/us-china-qualcomm/qualcomm-to-pay-975-million-to-resolve-china-antitrust-dispute-idUSKBN0LD2EL20150210.

134. Findings of Fact and Conclusions of Law at 157, Fed. Trade Comm. v. Qualcomm Inc., 411 F. Supp. 3d 658 (N. D. Cal. 2019) (No. 17-CV-00220-LHK) ("Qualcomm's royalty rates are unreasonably high . . . .").

135. Fed. Trade Comm'n v. Qualcomm Inc., 969 F.3d 974, 1003 (2020).

TABLE 2. THE INTERNATIONAL REGULATORY CAMPAIGN AGAINST SEP LICENSORS (SELECTED ACTIONS)

Year	*Regulator/ Court*	*Jurisdiction*	*Action*
2012	9th Cir., N.D. Ill.[136]	U.S.	Holds that seeking injunction is inconsistent with SEP owner's FRAND commitment.
2012	DOJ	U.S.	Approves acquisition by Google of Motorola Mobility, on condition that acquiror agrees not to seek injunctions against SEP infringers.[137]
2014	Fed. Cir.	U.S.	Holds that SEPs not entitled to injunction if licensee is willing to enter into license on FRAND terms.[138]
2014	MOFCOM	China	Approves Microsoft's acquisition of Nokia's device business provided Microsoft will not seek injunctions against SEP infringers.
2015	DOJ	U.S.	Business review letter approving SSO bylaw change to encourage or mandate component-level SEP licensing.[139]
2015	NDRC	China	Antitrust action against certain Qualcomm licensing practices.[140] Order requires Qualcomm to reduce royalty.
2016	KFTC	South Korea	Antitrust action against certain Qualcomm licensing practices. Assesses $854M fine.[141]

136. Microsoft Corp. v. Motorola, Inc., 696 F.3d 872, 877, 884 (9th Cir. 2012); Apple Inc. v. Motorola, Inc., 869 F. Supp. 2d 901, 914–15 (N.D. Ill. 2012).

137. *Google Agrees to Change Its Business Practices to Resolve FTC Competition Concerns in the Markets for Devices Like Smart Phones, Games and Tablets, and in Online Search*, *supra* note 107.

138. Apple Inc. v. Motorola Inc., 757 F.3d 1286, 1332 (Fed. Cir. 2014).

139. *See* Hesse *supra* note 110. The letter was "updated" (and effectively retracted) in 2020 by DOJ Antitrust and the update was then "demoted" on the DOJ website in early 2021. Hence, the original 2015 letter appears to have been reinstated. For discussion, see *supra* notes 128–129.

140. *See supra* note 133.

141. Kelcee Griffis, *Korea Fines Qualcomm $854M for Strings-Attached Licensing*, LAW360 (Jan. 3, 2017, 1:48 PM), https://www.law360.com/articles/876724/korea-fines-qualcomm-854m-for-strings-attached-licensing.

2017	TFTC	Taiwan	Antitrust action against certain Qualcomm licensing practices. Assesses $773M fine (reduced upon settlement).[142]
2018, 2019	EC	EU	Antitrust actions against certain Qualcomm licensing practices. In 2018, $1.2B fine for exclusivity incentives granted to Apple. In 2019, $272 million fine for predatory pricing.[143]
2019	N.D. Cal. (FTC litigation)	U.S.	Antitrust action against certain Qualcomm licensing practices. Order requires Qualcomm to renegotiate licenses with device producers and offer licenses to other chipmakers.[144] Order reversed on appeal.[145]

Note: Unless otherwise noted, some fines indicated above may be under appeal.

Legend: DOJ = Dept. of Justice; EC = European Commission; FTC = Federal Trade Commission; KFTC = Korea Fair Trade Commission; MOFCOM = China Ministry of Commerce; NDRC = National Development and Reform Commission; TFTC = Taiwan Fair Trade Commission; USPTO = U.S. Patent & Trademark Office

3. "Standard-Essential" Patent Antitrust: The Intellectual Tyranny of a Dominant Paradigm

This ambitious campaign by competition regulators to reengineer SEP licensing markets is predicated on theoretical models of patent holdup and royalty stacking.[146] These models of market failure yield empirically testable predictions and can therefore be assessed against the actual performance of real-world markets. If these theories are correct, then we should expect to observe that consumer prices would rise, output would fall, and, over time, SEP-intensive markets would attract less entry and R&D investment as private capital rationally shifted to more profitable opportunities. The wireless device market should be especially susceptible to this outcome since it is characterized by large numbers and fairly dispersed ownership of the SEP portfolio that is necessary to implement the relevant technology standard.[147]

142. Ian King & Debby Wu, *Qualcomm Wins Taiwan Reprieve Amid Global Antitrust Battle*, BLOOMBERG (Aug. 9, 2018, 10:23 PM), https://www.bloomberg.com/news/articles/2018-08-10/qualcomm-reaches-settlement-with-taiwan-to-slash-antitrust-fines.

143. Chad Bray, *E.U. Fines Qualcomm $1.2 Billion Over Apple Deal*, N.Y. TIMES (Jan. 24, 2018), https://www.nytimes.com/2018/01/24/business/eu-qualcomm-fine-antitrust.html; Laurence Norman, *Qualcomm Hit by Second Antitrust Fine in Europe*, WALL ST. J. (July 18, 2019, 7:06 AM), https://www.wsj.com/articles/qualcomm-receives-second-antitrust-fine-in-europe-11563443152.

144. Fed. Trade Comm'n v. Qualcomm, Inc., 411 F. Supp. 3d 658, 819–21 (N.D. Cal 2019).

145. Fed. Trade Comm'n v. Qualcomm, Inc., 969 F.3d 974, 1005 (2020).

146. *See* Barnett, *Has the Academy*, *supra* note 98, at 1316, and accompanying text.

147. It is estimated that the top 20 patentees held 85.5% of all declared SEP families relating to the 4G/LTE standard and, as of July 2018, held 65.2% relating to the 5G standard.

Almost three decades of market performance have not supported these predictions. To the contrary: the wireless communications market appears to provide an almost textbook case of market efficiency, whether understood in static or dynamic terms. The market has exhibited continuous innovation in the upstream R&D and chip design market, robust entry into the downstream production market,[148] and consistent declines in quality-adjusted prices in SEP-intensive industries (both absolutely and relatively when compared to non-SEP-intensive industries).[149] Contrary to holdup and stacking models that had mentioned anecdotal reports of double-digit SEP royalties,[150] subsequent empirical studies using different methodologies have found that patent licensors collectively impose an estimated aggregate royalty burden in a range of three to five percent of global handset revenues.[151] That relatively modest royalty rate, which has remained largely constant over the lifetime of the industry, plausibly explains why the wireless device market has achieved broad and rapid adoption by intermediate and end-users, contrary to theoretical models that anticipate that the market would stall or shrink under high patent intensity and dispersed patent ownership.

The mismatch between empirical evidence and the regulatory consensus is striking and difficult to ignore. Even some scholars who argue that patent

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Author's calculations, based on: for 4G, WORLD INTELL. PROP. ORG., INTANGIBLE CAPITAL IN GLOBAL VALUE CHAINS 111 fig.4.9 (2017) ("Latest assignee company shares of worldwide SEPs for the LTE standard based on patent family count") (based on IPlytics database); and for 5G, Tim Pohlmann, *Who Will be Technology Leader for 5G? Part Two*, IAM MEDIA (July 18, 2018) ("Table 1: SEP declarations for 5G") (based on IPlytics database), https://www.iam-media.com/who-will-be-technology-leader-5g-part-two.

148. Keith Mallinson, *Don't Fix What Isn't Broken: The Extraordinary Record of Innovation and Success in the Cellular Industry Under Existing Licensing Practices*, 23 GEO. MASON L. REV. 967, 993–94 (2016); Kirti Gupta, *Technology Standards and Competition in the Mobile Wireless Industry*, 22 GEO. MASON L. REV. 865, 893–94 (2015).

149. Galetovic at al., *supra* note 94, at 551–54.

150. *See, e.g.*, Lemley & Shapiro, *supra* note 98, at 2025–27.

151. *See* Alexander Galetovic, Stephen H. Haber & Lew Zaretski, *An Estimate of the Average Cumulative Royalty Yield in the World Mobile Phone Industry: Theory, Measurement and Results*, 42 TELECOMMS. POL'Y 263, 266 (2018) (concluding that the average estimated cumulative royalty is equal to 3.4% at device level); Alexander Galetovic, Stephen Haber & Lew Zaretski, *Is There an Anticommons Tragedy in the World Smartphone Industry?*, 32 BERKELEY TECH. L.J. 1527, 1532–33 (2017) [hereinafter Galetovic, Haber & Zaretski, *Anticommons Tragedy*] (finding that the total royalty burden represents 3.4% of average selling price of device at retail level); J. Gregory Sidak, *What Aggregate Royalty Do Manufacturers of Mobile Phones Pay to License Standard-Essential Patents*, 1 CRITERION J. ON INNOVATION 701, 718–19 (2016) (showing that the total SEP royalty represents 4 to 5% of global handset revenues in the 3G and 4G markets); Keith Mallinson, *Cumulative Mobile-SEP Royalty Payments No More Than Around 5% of Mobile Handset Revenues*, WISEHARBOR (Aug. 19, 2015), www.wiseharbor.com/pdfs/Mallinson%20on%20cumulative%20mobile%20SEP%20royalties%20for%20IP%20Finance%202015Aug19.pdf (finding that the total royalties paid by smartphone producers equal to approximately 5% of mobile handset revenues in the 2G, 3G and 4G markets). Relatedly, a recent empirical study finds that wireless device markets exhibit price and output characteristics that are inconsistent with the predictions of royalty stacking theory. *See* Alexander Galetovic & Kirti Gupta, *The Case of the Missing Royalty Stacking in the World Mobile Wireless Industry*, 29 INDUS. & CORP. CHANGE 827 (2020).

holdup remains a matter of pressing policy concern acknowledge that there is no systematic evidence of patent holdup, while emphasizing that it could nonetheless arise in particular circumstances.[152] At a minimum, the gap between theory and evidence necessitates reconsidering the theoretical models that originally motivated the regulatory actions to undo existing licensing arrangements in wireless device markets. This reexamination exercise identifies several key oversimplifications in those models when compared to the real-world markets they purport to describe. Most importantly, the standard model assumes a single-period profit-maximization calculus, whereas wireless technology markets are characterized by multi-period payoff maximization games in which IP holders are typically repeat players that seek to maximize revenues over multiple technology generations, for example, 2G, 3G, 4G and so on, rather than a single iteration of the relevant standard, for example, 3G only.[153] It is important to appreciate that the repeat-play character of the wireless market is *inherent* to the recursive character of R&D activity in this environment, which consists of a sequence of overlapping technology generations and sub-generations. While the holder of a critical 4G-related

152. Thomas F. Cotter, Erik Hovenkamp & Norman Siebrasse, *Demystifying Patent Holdup*, 76 WASH. & LEE L. REV. 1501, 1546–48 (2020); Jorge L. Contreras, *Much Ado About Hold-Up*, 2019 U. ILL. L. REV. 875, 896–98; Siebrasse, *supra* note 98, at 299. Other scholars dismiss the relevance of evidence that challenges patent holdup theory without consideration of all relevant studies or detailed examination of those studies' substantive findings or methodology. *See, e.g.*, Carl Shapiro & Mark A. Lemley, *The Role of Antitrust in Preventing Patent Holdup*, 168 U. PA. L. REV. 2019, 2041–42 (2020) (referring generally to empirical evidence contesting the existing of patent holdup, citing two of five major studies, and dismissing those studies' relevance on the ground that they do not exclude the counterfactual in which patent holdup increased handset prices); A. Douglas Melamed & Carl Shapiro, *How Antitrust Law Can Make FRAND Commitments More Effective*, 127 YALE L. J. 2110, 2111, 2117–18 (2018). Specifically, Melamed and Shapiro dismiss the relevance of empirical studies (while citing only one of five major studies) that "purport to show that concerns about . . . excessive royalties are unfounded" on the ground that these studies lack "proper controls" and therefore do "not prove a lack of costly opportunism by the owners of SEPs." *Id.* at 2117. While the unknown counterfactual problem is a reasonable source of concern (which I address subsequently in Parts III.B and C), a blanket dismissal of this well-developed body of evidence without undertaking any closer substantive or methodological inquiry or offering any alternative empirical approach is puzzling. Explanatory theories are always incomplete in some respect, which explains why reasoned inquiry must typically select among competing theories based on which theory displays the best fit with the available body of evidence, subject to an unavoidable residual level of uncertainty. An explanatory theory is not reasonably discarded solely because it fails to definitively exclude all alternative explanations, unless one of those alternative explanations can provide a more complete account of the relevant body of available evidence. For related observations, see Jonathan M. Barnett, *Patent Groupthink Unravels*, HARV. J.L. & TECH. 419, 441–42 (2021); J. Gregory Sidak, *Is Patent Holdup a Hoax?,* 3 CRITERION J. ON INNOVATION 401, 437–38, 446–47, 449 (2018).

153. The exception to this repeat-play characteristic would be "patent assertion entities" that acquire standard essential patents solely for the purpose of extracting a windfall gain through licensing and litigation strategies. I am not aware of evidence indicating that this type of entity is a common or frequent source of infringement litigation or licensing activity in the wireless device markets.

technology asset could elevate royalty rates to "exorbitant" levels in a single generation, it would pay the price upon launch of the 5G standard when licensees can select among competing technology systems or components, which would be evaluated based in part on the reputational capital held by the licensor. Even within a single generation, it is not necessarily the case that an IP licensor would maximize profits by selecting an "exorbitant" royalty rate since doing so would hinder adoption of its technology, limiting the sales base from which it can extract royalties. Innovators must initially compete with other technology standards for market adoption and, since standards competitions typically result in only one standard being adopted by the market, failing this objective results in a zero return on billions of dollars in R&D costs. Given these competitive pressures, an IP licensor even has strong incentives to cultivate adoption of its existing technology through a consistently modest royalty rate.

The simplified models that drive holdup and stacking theories, as compared to the nuanced characteristics of real-world wireless device markets, can explain why these theories have faltered when subjected to empirical examination. Yet, with the notable exception of DOJ Antitrust from November 2017, joined by the USPTO in December 2019, through January 2021,[154] competition regulators and much of the scholarly community has largely declined to integrate these empirical studies into a revised evaluation of the existing policy approach toward SEPs and the FRAND requirement in wireless markets. This risks an unfortunate reversion to the formalist and empirically indifferent thinking that once characterized the antitrust treatment of IP licensing under crude per se liability rules prior to the *Sylvania* decision. All available evidence presents a picture of IP licensing in the smartphone and related electronics markets that contrasts sharply with the theoretical predictions made in the mid-2000s by some scholarly commentators and almost universally adopted by competition regulators as the basis for far-reaching enforcement actions that, if implemented, would significantly modify current licensing practices. Contrary to the near-consensus in the international regulatory community (and much of the associated academic literature), the IP licensing framework through which innovator-firms transmit valuable IP assets to device producers has not suppressed market growth under a stifling licensing "tax" but rather, has promoted rapid and widespread adoption among intermediate and end-users at declining quality-adjusted prices, while delivering returns to sustain a continuous stream of R&D investments by innovators. Subject to the non-excludable counterfactual in which net efficiency gains would be even greater under a weaker IP regime, addressed

154. *See supra* note 97. The January 2021 endpoint is selected reflecting the fact that, as of this writing, DOJ Antitrust under the Biden Administration has not yet expressed a clear view on the antitrust treatment of SEPs. In light of the executive order issued by President Biden in July 2021, it seems likely that DOJ Antitrust will abandon or modify at least some elements of the prior administration's policies toward SEPs. For discussion, see *supra* note 139.

further below,[155] there is a reasonably high level of confidence that the existing state of affairs represents a net-positive welfare outcome that has both supported innovation and commercialization incentives for R&D-specialist firms while promoting technology dissemination among producers and access among end-users. If that is the case, then there is no clear evidence of market failure and no plausible cost-benefit justification for expansive interventions by antitrust authorities to rewrite long-established and apparently well-functioning licensing arrangements.

III. THE ENABLING VIEW OF INTELLECTUAL PROPERTY LICENSING

Skepticism toward IP licensing, both in its historical and newly revived forms, reflects a presumptive characterization of IP licenses as an exclusionary tool by which the patentee impedes competitive entry through actual or threatened litigation and thereby expands its state-granted monopoly franchise. Law-and-economics scholars had mostly critiqued this position indirectly as part of the "Chicago" school's larger project of identifying the economic illogic behind the per se rules of liability that agencies and courts, starting in the 1940s and extending through the 1970s, had widely applied to contractual clauses such as tying, territorial division, resale price maintenance, and exclusivity commitments, including circumstances in which those clauses appeared in IP licenses.[156] This project was primarily a reactive undertaking and was not tailored to the economics of IP-related business practices in particular. Scholars sought to challenge on theoretical and empirical grounds then-prevailing assumptions that reflexively attributed anti-competitive effects to vertical restraints based largely on form rather than economic substance or actual evidence of net harms to competition in terms of restrained output or increased price. As these scholars showed, several contractual practices that antitrust law had reflexively condemned as being inherently anti-competitive often or even typically promoted objectives that are consistent with the competitive process.[157] For the most part, however, neither these early law-and-economics scholars nor the follow-on literature has undertaken the proactive task of developing a more precise understanding of the

155. *See infra* Parts III.B and C.

156. For discussions of IP licensing from this early law-and-economics critique of postwar antitrust, see BOWMAN, *supra* note 42; Aaron Director & Edward Hirsch Levi, *Law and the Future: Trade Regulation*, 51 NW. U. L. REV. 281, 291–294 (1956). For the most well-known work that critiqued antitrust law more generally, including especially its treatment of vertical restraints, see ROBERT H. BORK, THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF (1978).

157. For pioneering contributions on these points, see BORK, *supra* note 156; RICHARD A. POSNER, ANTITRUST LAW: AN ECONOMIC PERSPECTIVE 147–66 (1976); Williamson, *supra* note 19, at 960; Robert H. Bork, *Vertical Restraints:* Schwinn *Overruled*, 1977 SUP. CT. REV. 171.

economic functions and associated welfare effects specifically attributable to IP licensing and related IP-dependent arrangements in the context of real-world technology and content markets.[158]

In this Part, I take a preliminary step toward that larger project. For this purpose, I identify and analyze a set of paradigm transactional scenarios in which IP licenses and other IP-intensive contractual arrangements operate as an enabling tool that facilitates cooperative arrangements among differently specialized entities involved in various steps of the innovation and commercialization process. Contrary to both traditional skepticism toward IP licensing and the Chicago school's critique of that approach, I explicitly consider the economic characteristics that are specific to intangible goods and the mechanisms that are used to convert an intangible good into a commercially feasible product for the target intermediate or end-user market. This broadened real-world perspective suggests that IP-intensive content and technology markets typically engineer transactional structures that facilitate efficient arrangements among the holders of complementary innovation and commercialization assets while mitigating the IP-specific transaction costs that might unduly limit access and inhibit subsequent innovation.

This approach differs from the "license-as-tax" view in two important respects. First, contrary to the widespread characterization of the IP owner as an unrestrained monopolist that can extract all available economic surplus through its monopoly franchise, I offer an alternative view in which IP owners typically craft licenses not to impose an extractive "tax" on intermediate and end-users but rather, as is widely recognized in the case of property rights generally, to enable market pricing of intellectual assets and, in the process, facilitate value-creating transactions with other entities that hold complementary IP or non-IP assets. Second, contrary to the widespread characterization of IP licenses as a source of friction that impedes knowledge exchange and sequential innovation, I offer an alternative view in which IP licenses and other IP-intensive contractual arrangements *lower* transaction costs by enabling value-creating exchanges of informational assets among business

158. Patent and IP scholars have made important contributions that relate to this point, although usually without explicitly addressing related antitrust issues. Some scholars have studied how IP licenses can support different types of business models in IT and other markets. *See* Robert W. Gomulkiewicz, *Is the License Still the Product?*, 60 ARIZ. L. REV. 425 (2018); Barnett, *Why Is Everyone Afraid*, *supra* note 26; Chien, *supra* note 2, at 1678. Other scholars have analyzed more generally how patents facilitate commercialization relationships. *See, e.g.*, Jonathan M. Barnett, *Intellectual Property as a Law of Organization*, 84 S. CAL. L. REV. 785 (2011) [hereinafter Barnett, *Intellectual Property as a Law of Organization*]; F. Scott Kieff, *Coordination, Property, and Intellectual Property: An Unconventional Approach to Anticompetitive Effects and Downstream Access*, 56 EMORY L.J. 327 (2006); F. Scott Kieff, *IP Transactions: On the Theory & Practice of Commercializing Innovation*, 42 HOUSTON L. REV. 727 (2005); Robert P. Merges, *A Transactional View of Property Rights*, 20 BERKELEY TECH. L.J. 1477 (2005). For more theoretical economic treatments of the role that patents can play in facilitating and impeding sequential innovation, see *supra* note 26.

parties that would otherwise be unable to enter into these arrangements given the risk of expropriation by sophisticated counterparties. This is not to deny the obvious fact that IP licenses inherently impose access costs on certain intermediate and end-users, both directly in the form of a royalty and indirectly in the form of negotiation costs, that would not otherwise exist. However, any *net* welfare assessment of a particular licensing practice must always offset these access costs against the innovation and other economic gains attributable to any such practice. Given the complex and case-specific interaction between the costs and gains reasonably attributable to any particular IP licensing practice, with the exception of collusive licensing arrangements among direct competitors, these practices are generally best examined under an appropriately tailored version of the rule-of-reason standard that antitrust law applies in the case of restraints for which there is no immediately clear case of competitive harm.[159]

A. *Vertical Licensing I: Hub-and-Spoke Structures*

Two dichotomous organizational tendencies recur in innovation environments. First, there tend to be *diseconomies of scale* in innovation. Theoretical models anticipate, and technology history and empirical studies show, that breakthrough types of innovation tend to arise in smaller-firm environments in which founder-entrepreneurs have a large degree of control over, and substantial stake in, the enterprise.[160] With some exceptions, large-firm organizations, and the bureaucratic apparatus and separation of ownership and management that are typical in those organizations, tend to discourage investment in the highest-risk innovation projects that may render obsolete an existing dominant technology. [161] Second, there tend to be *economies of scale* in the

159. For discussion of the "sliding scale" used by U.S. courts to calibrate the level of inquiry to the apparent risk of competitive harm raised by a contested business practice, see *supra* note 62.

160. On this point, see JONATHAN M. BARNETT, INNOVATORS, FIRMS, AND MARKETS: THE ORGANIZATIONAL LOGIC OF INTELLECTUAL PROPERTY 54–56 (2021). For a leading historical study on the technological contributions of the independent inventor, see JOHN JEWKES, DAVID SAWERS & RICHARD STILLERMAN, THE SOURCES OF INVENTION (2d ed. 1969).

161. For primarily theoretical discussion of these points, see David J. Teece, *Firm Organization, Industrial Structure, and Technological Innovation*, 31 J. ECON. BEHAV. & ORG. 193, 200–01, 212–13 (1996); Bengt Holmström, *Agency Costs and Innovation*, *in* THE MARKETS FOR INNOVATION, OWNERSHIP AND CONTROL 131 (Richard H. Day et al. eds., 1993); Kenneth. J. Arrow, *Innovation Large and Small Firms*, 2 J. ENTREPRENEURIAL FIN. 111 (1993). For a review of the relevant empirical literature (showing generally that smaller firms tend to favor higher-risk innovation projects, and larger firms tend to favor lower-risk or process-oriented innovation projects), see Wesley M. Cohen, *Fifty Years Empirical Studies of Innovative Activity and Performance*, *in* HANDBOOK OF THE ECONOMICS OF INNOVATION 129, 137–40 (Bronwyn Hall & Nathan Rosenberg eds., 2010); NAT'L ACAD. OF ENG'G, RISK & INNOVATION: THE ROLE AND IMPORTANCE OF SMALL HIGH-TECH COMPANIES IN THE U.S. ECONOMY 37–39, 48–51 (1995); WILLIAM L. BALDWIN & JOHN T. SCOTT, MARKET STRUCTURE AND

commercialization of innovation assets. Even in market segments in which innovation may be a relatively low-cost endeavor, the actions required to commercialize an innovation on a mass scale typically require substantial fixed-cost investments in testing, especially in the case of pharmaceutical products, production, and distribution infrastructure.[162] This is compounded by the fact that most novel technologies or creative works fail to deliver a net positive return to the entities that incurred the costs to develop and bring those products to market.[163] That risk can be feasibly borne, however, by intermediaries or other large entities that fund diversified portfolios of technological projects or creative properties, which in the aggregate can yield net positive returns. In short: size tends to be a disadvantage in the innovation process but an advantage in the commercialization process.

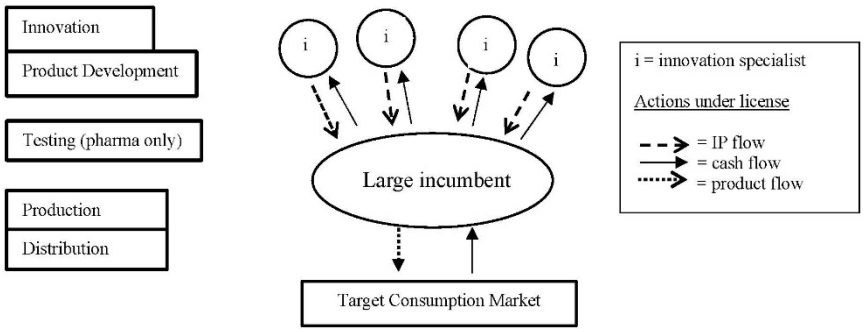
These two organizational tendencies in innovation environments explain why technology and content environments that otherwise have little in common often adopt a "hub-and-spoke" structure. In this structure, the hub is populated by a small handful of large entities, which primarily engage in "run-of-the-mill" but capital-intensive production, marketing, and distribution activities, while the spokes are populated by a substantially larger group of smaller firms that focus on lower-cost but higher-risk innovation activities. The hub-and-spoke structure simply applies the standard principles of division of labor to informational asset markets. While upstream entities often have unique innovative capacities that would not be fully exploited in a large-firm environment, downstream entities tend to have lower-cost access to the capital resources and operational expertise without which the relevant technology or creative properties could not be efficiently produced, marketed, and distributed. This hub-and-spoke structure, which is shown in simplified form below, appears in content markets such as motion pictures, in which studios finance and source content from smaller production companies, and technology markets such as biopharmaceuticals, in which "Big Pharma" sources R&D inputs from small biotech firms. The recurrence of similar organizational structures across otherwise disparate market environments suggests a common economic logic.

TECHNOLOGICAL CHANGE 63–113 (1987); EDWIN MANSFIELD, THE ECONOMICS OF TECHNOLOGICAL CHANGE 107–10 (1968).

162. On large firms' advantages in the commercialization process, see Teece, *supra* note 161, at 204–05.

163. On low rates of project success in technology markets, see F.M. Scherer & Dietmar Harhoff, *Technology Policy for a World of Skew-Distributed Outcomes*, 29 RSCH. POL'Y 559 (2000). On low rates of project success in content markets, see Jonathan M. Barnett, *Copyright Without Creators*, 9 REV. L. & ECON. 389, 398–99 (2013).

FIGURE 1. HUB AND SPOKE STRUCTURE[164]



IP licensing transactions, anchored in a foundation of reasonably secure IP rights, supply the legal mechanism that underlies the hub-and-spoke structure. I will illustrate by reference to the creative markets, although the same logic applies in technology settings. In the motion picture context, the combination of secure IP rights and licensing contracts structure the relationship between an outside production company (the "spoke") and a studio (the "hub"). Each of these parties specializes in a different portion of the supply chain and it is therefore mutually beneficial to enter into a contractual relationship in order to execute the innovation and commercialization process. Without a secure copyright portfolio, the production company could not safely negotiate the terms of its relationship with the studio, which must first address the financing of the production and agreed-upon split of the revenue streams after box-office release. In a legal environment in which IP-enabled contractual agreements could not be reliably enforced, content production would move in-house as firms sought to protect creative properties from third-party imitators and to preserve the ability to earn a positive return at market release. That weak-IP environment would be inhospitable for independent production companies, which lack the capital and expertise required to establish and maintain a distribution infrastructure, in part because they cannot spread the costs of that fixed-cost investment across a large pool of creative properties. Far from blocking entry, it is precisely the combination of secure IP rights and reliably enforced IP licenses that lowers entry barriers and spreads economic rewards across the creative ecosystem.

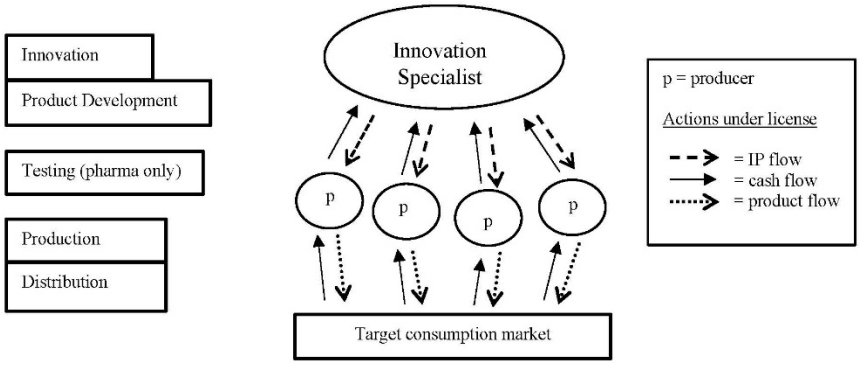
B. *Vertical Licensing II: Cultivating Intellectual Property Prospects*

In a classic article, Edmund Kitch proposed that the holder of a broadly defined patent would have incentives to cultivate efficiently what he called the "prospect" of derivative applications arising from a single fundamental

164. This Figure is adapted from Barnett, *Why is Everyone Afraid*, *supra* note 26, at 138 fig.3.

innovation.[165] Much of the novelty, and controversy, in Kitch's argument lay in the fact that he emphasized how a patent can enable its owner to coordinate the development of an intellectual territory of follow-on innovations, potentially in cooperation with other firms that provide complementary commercialization or follow-on innovation capacities.[166] While Kitch's argument was mostly theoretical, it closely tracks a common transactional structure in which a firm that owns a "disembodied" IP asset but lacks downstream commercialization capacities to convert that asset into a marketable good licenses the asset to a downstream pool of intermediate users, which then embed the technology in a wide range of applications for the target end-user market. As shown in the Figure below, this structure flips the many-to-one "hub-and-spoke" structure into a one-to-many "IP prospect" structure.

FIGURE 2. "IP PROSPECT" STRUCTURE



This monetization structure has been used successfully by technology pioneers in a variety of markets, including: Dolby Laboratories, which licenses its dominant audio technology to downstream device producers in the consumer electronics and theatrical exhibition markets; ARM Holdings, which licenses its dominant "chip architecture" to semiconductor firms that design chips for the smartphone and other IT markets; and Qualcomm, which licenses its dominant wireless communications technology to smartphone device manufacturers.[167] Contrary to the license-as-tax view of patent licensing,

165. Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 265 (1977).

166. *Id.* at 277.

167. For further details, see Dolby Laboratories Inc., Annual Report (Form 10-K) 4–6 (Nov. 14, 2018); ARM HOLDINGS PLC, ANNUAL REPORT 2015: STRATEGIC REPORT 24 (2015); Qualcomm Inc., Annual Report (Form 10-K) 8 (Nov. 7, 2018). Note that I relied on the 2015

these firms have not hoarded their foundational technologies in order to capture the bulk of available economic surplus in the relevant market. Rather, they have used licensing mechanisms to disseminate their technologies widely to a broad population of downstream producers and other customer-facing firms that are best situated to embed those technologies in devices for the end-user market. This licensing structure in turn generates a royalty stream that enables upstream innovators to earn a return on their past R&D investments and fund additional R&D investments to continue developing and disseminating technology inputs to the downstream production and distribution segments of the supply chain. It is precisely this socially constructive positive feedback mechanism that is overlooked by a predominately extractive view of IP licensing.

Kitch acknowledged the obvious objection that a broad patent may enable the patent owner to exercise market power but observed that this would not always or even usually be the case given that "[m]any patents face competition from other processes or products."[168] The "IP = monopoly" equation that underlies conventional economic analysis and much legal analysis of IP rights is not the typical scenario. It turns out that Kitch's unconventional intuitions were largely on the mark. As I discuss subsequently, Kitch's modest estimation of IP holders' pricing power has been supported by empirical findings that patents generate relatively modest incremental premiums in a wide range of industries, with the exception of pharmaceuticals.[169] Moreover, even in the case of foundational technologies that would appear to confer pricing power, it appears that the patent owner sometimes elects not to exercise it. To illustrate, consider the landmark "Cohen-Boyer" patent,[170] which covers the fundamental recombinant DNA techniques that launched the biotechnology industry in the 1980s. The patent owner, Stanford University, elected to offer this valuable patent for licensing on a non-exclusive basis and at a lump-sum fee plus percentage running royalty rate that was widely perceived to be "below-market," with further reduced rates for smaller firms. During the life of the patent, it was licensed to 468 companies, some of which, notably Genentech and Amgen, grew from start-ups to biotech leaders, and resulted in over 2,442 new products.[171]

This licensing policy might be ascribed to the publicly-minded mission of a university but for the fact that similarly low licensing rates have been

Strategic Report for ARM because it was taken private in an acquisition transaction by Softbank in 2016.

168. Kitch, *supra* note 165, at 274.

169. For further discussion, see *infra* notes 196–98 and accompanying text.

170. Process for Producing Biologically Functional Molecular Chimeras, U.S. Patent 4,237,224 (issued Dec. 2, 1980).

171. Maryann P. Feldman, Alessandra Colaianni & Connie Kang Liu, *Lessons from the Commercialization of the Cohen-Boyer Patents: The Stanford University Licensing Program*, *in* INTELLECTUAL PROPERTY MANAGEMENT IN HEALTH AND AGRICULTURAL INNOVATION: A HANDBOOK OF BEST PRACTICES (A. Krattiger et al. eds., 2007).

adopted by the holders of critical portfolios of patents relating to wireless communications devices and consumer electronics.[172] In fact, there is a sensible economic explanation for this apparent benevolence. If the patent owner has no downstream commercialization capacities, it has no strategic incentive to erect a barrier to entry for any particular firm in the target end-user market. To the contrary: it prefers to *eliminate* barriers to entry into that market. In the case of Stanford, it most likely expected to maximize revenues by licensing all interested firms at a relatively modest rate that would then elicit widespread adoption; by contrast, a higher rate may have discouraged smaller firms from taking a license or induced those firms to use the technology without seeking a license, which would have required Stanford to incur substantial enforcement costs. Paradoxically, even (or especially) in the case of the most valuable foundational patents, private self-interest in maximizing revenues and social interest in maximizing access may coincide: the patent owner's revenue-maximization incentives result in broad dissemination of the IP-protected technology through a patent-licensing framework. While Kitch's "IP prospect" theory has often been dismissed as unrealistic,[173] it appears to describe a material number of real-world innovation environments.

C. *Hybrid Licensing: Pools and Anti-Licenses*

So far, I have considered transactional structures that have two characteristics in common: (i) they are comprised exclusively of vertical relationships between upstream entities that originate or control IP assets, on the one hand, and downstream entities with specialized capacities in realizing the commercial value of those assets, on the other hand; and (ii) they are comprised of many-to-one or one-to-many transactions in which the relevant IP asset is held by a single entity. There is an important category of licensing structures that do not share these characteristics. These hybrid structures combine both horizontal flows of IP assets among upstream IP owners and vertical flows of IP assets from upstream owners to downstream intermediate users. Below I discuss two key examples: patent pool arrangements and IP giveaway strategies in IT markets. In both cases, a secure IP rights and contracting infrastructure is a predicate condition for being able to form these

172. For discussion of the low royalty assessed by a patent pool in the automotive industry, see Jonathan M. Barnett, *The Anti-Commons Revisited*, 29 HARV. J.L. & TECH. 127, 152–53 (2015) [hereinafter Barnett, *Anti-Commons*], and by the holder of critical patents on "cracking" technologies in the petroleum refining industry, see *id.* at 159. For discussion of the low royalty rates assessed by patent pools in consumer technology markets, see Jonathan M. Barnett, *From Patent Thickets to Patent Networks: The Legal Infrastructure of the Digital Economy*, 55 JURIMETRICS 1, 43–45 (2014) [hereinafter Barnett, *From Patent Thickets*] (covering pooling structures in the IT industry).

173. *See, e.g.*, F.M. SCHERER, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 447 n.30 (2d ed. 1980) (stating that Kitch's theory is "little influenced by any concern for reality").

transactional structures and secure the efficiency gains arising from commercialization of the underlying technology.

1. Patent Pools

Academic commentary has frequently *theorized* that the intensive issuance of IP rights, coupled with the dispersion of those rights among multiple holders, creates a "patent thicket" that slows down innovation or inflates end-user prices under the burden of licensing-related and litigation-related costs.[174] Yet facts have largely failed to support these expectations. Empirical evidence from both contemporary and historical markets shows remarkably little support for the view that IP thickets have arisen and persisted in commercially significant markets.[175] As first observed by Robert Merges,[176] what the evidence does show is that both content and technology markets are remarkably adept at engineering licensing and other transactional solutions to potential patent or other IP rights thickets. In particular, Merges observed that the music industry had devised collective licensing arrangements in order to preempt any potential IP thicket that could arise from the fact that the public performance rights relating to musical compositions[177] were dispersed among multiple owners, which would appear to pose an insuperable obstacle to administering, licensing, and enforcing these rights.[178] In subsequent research, I found that the music industry was not alone in preemptively devising solutions to potential IP-related transactional roadblocks. The automotive and aircraft markets, as well as significant segments of the information technology markets, discussed further below, had similarly engineered transactional solutions to potential IP thickets.[179] Based on the best available evidence over a considerable time period and across multiple innovation environments, it appears that private ordering generally precludes IP thickets from being realized in practice.

This recurrent avoidance of market failure in IP-intensive markets should be neither surprising nor exceptional. If IP rights generate a transactional roadblock to the profitable exploitation of IP rights or are expected to do so,

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174. For the leading source, see Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698 (1998).

175. For a review of the evidence generally, see Barnett, *Anti-Commons*, *supra* note 172, at 141–64. For a review of the evidence on patent thickets in the biomedical sector in particular, see Charles R. McManis & Brian Yagi, *The Bayh-Dole Act and the Anticommons Hypothesis: Round Three*, 21 GEO. MASON L. REV. 1049 (2014).

176. *See* Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CALIF. L. REV. 1293 (1996).

177. Under U.S. copyright law, the copyright covering a musical composition includes a "bundle" of rights, among which is the right to public performance of the composition. *See* 17 U.S.C. § 106. Historically, this right primarily relates to radio play.

178. Merges, *supra* note 176, at 1295–98, 1328–40.

179. Barnett, *Anti-Commons*, *supra* note 172, at 141–82 (covering the IT, automotive and aircraft industries); Barnett, *From Patent Thickets*, *supra* note 172.

then firms—whether IP owners or third-party intermediaries—have a profit incentive to engineer a detour around that roadblock and capture the economic value arising from the resulting stream of new products and services. This expectation has been confirmed repeatedly in IT markets. If the patent thicket thesis were factually cogent, then the IT markets, in which hundreds to thousands of patents can relate to a single device and are held by multiple firms, should exhibit some combination of exorbitant prices, slow growth, and meager entry. A patent thicket would impose high licensing fees and a high likelihood of patent infringement liability, which would discourage entry into the market by new producers and distributors, leading to reduced pressures on existing firms to compete on price, quality, or other parameters. Yet what we actually observe is just the opposite.

Data covering the period since the late 1990s show that the U.S. computing and electronics markets, including PCs, laptops, tablets, and mobile phones, have exhibited high growth rates, declining prices adjusted for quality, and a constant stream of new products.[180] A comparison of the price ($328) and functionalities of a smartphone in 2017 with the price ($1,565, equivalent to approximately $4,147 in 2019 dollars) and far more limited functionalities of an IBM PC in 1981 illustrates dramatically these historical tendencies in electronics markets, which have continuously delivered to consumers increasing product quality at a decreasing cost.[181]

A particular type of licensing structure can explain in part why at least certain segments of the IT markets have avoided the high prices, low output and slow growth anticipated by the IP thicket thesis. Starting in the late 1990s, IT markets that are governed by common technology standards have sometimes made use of patent pooling structures, which preempt potential litigation among patent owners and enable all firms in the industry to efficiently access the technologies required to produce devices in conformity with the governing standard.[182] These structures have taken the form of either consortia assembled by leading IP owners or, more frequently, collective licensing mechanisms engineered by for-profit entities that specialize in the assembly and administration of patent pools. As shown in the Figure below, these externally administered pools typically consist of three elements: (i) a relatively small group of IP licensors, who contribute patents to a pool relating to a technology standard; (ii) a relatively large group of IP licensees, which may

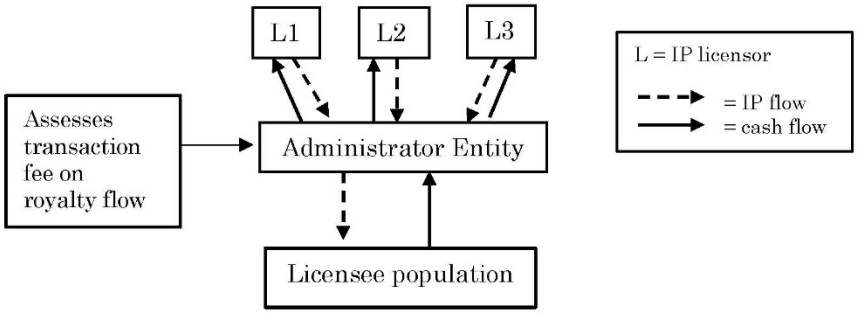
180. Barnett, *Anti-Commons*, *supra* note 172, at 143.

181. On the 2017 average price of a smartphone, see Troy Wolverton, *The Average Price Consumers Are Paying for Smartphones Is Going Back Up–And You Can Thank Apple's $1,000 iPhone X*, BUS. INSIDER (Jan. 25, 2018, 6:36 PM), https://markets.businessinsider.com/news/stocks/apple-iphone-x-boosts-the-average-price-of-smartphones-charts-2018-1 (detailing the 2017 average price of a smartphone). On the 1981 listed price for an IBM PC, see *The Birth of the IBM PC*, IBM, https://www.ibm.com/ibm/history/exhibits/pc25/pc25_birth.html (last visited Feb. 21, 2022) (detailing the 1981 listed price for an IBM PC).

182. Barnett, *From Patent Thickets*, *supra* note 172, at 14–16.

also include IP licensors, who pay royalties for access to the pool; and (iii) the third-party administrator entity that assembles and administers the pool, in exchange for a transaction fee collected from royalty payments, which are then allocated among the IP licensors. While the patent thicket thesis anticipates that licensing activity in IP-intensive markets will impede access, inflate prices, and deter innovation, real-world IT markets show that parties use licensing arrangements to avoid thickets and accrue the efficiency gains that arise from replacing multiple licensing transactions with a single transaction through the pooling mechanism.

FIGURE 3. PATENT POOL STRUCTURE



Any patent pooling mechanism inherently raises the risk of collusion, whether directly through the royalty rate or indirectly through the prices at which devices are sold in the end-user market. For this reason, patent pools were prohibited as a *de facto* matter from the late 1930s through the 1990s,[183] consistent with the per se-style approach that characterized the antitrust treatment of licensing practices generally during this period.[184] Given the observed performance of patent pools in current IT markets, this wholesale prohibition, as distinguished from a nuanced approach that subjects such arrangements to special scrutiny, almost certainly resulted in false positive errors by suppressing efficient licensing arrangements and inducing firms to develop stand-alone technology packages, which in turn tends to reduce informational dissemination, raise entry costs and promote industry concentration. Current patent pools reflect a more nuanced approach that balances the procompetitive interest in facilitating solutions to potential IP roadblocks

183. *Id.* at 4.
184. *See supra* notes 32–41 and accompanying text.

against the collusion risk that is inherent to the joint licensing of IP assets, even if administered by a third party. In particular, the modern revival of patent pools was accompanied by a sequence of business review letters issued by the DOJ starting in the late 1990s,[185] which established a standard template for organizing patent pools at a low level of antitrust risk. That template, which seeks to maximize the efficiency gains and minimize the collusive risks inherent to any form of centralized licensing involving actual and potential competitors, generally consists of the following key elements: (i) the pool is open to all interested licensees on "reasonable and nondiscriminatory terms;" (ii) the pool is restricted to complementary patents that are deemed "essential" for the relevant standard; (iii) licensors are free to license independently of the pool; and (iv) the pool does not specify prices in the relevant product market.[186] Additionally, most pools are administered by a third party and at least some pools require that licensors pay the same royalty rate as licensees, which tends to limit a licensor's incentive to exert influence over the pool to adopt high royalty rates since it will bear a portion of any rate increase to the extent it is a licensee.[187] Assuming these elements sufficiently mitigate collusion risk, pooling structures are almost certainly welfare-enhancing mechanisms that have mitigated potential patent thickets, fostered dissemination of IP assets among a broad population of intermediate users, and lowered entry costs by enabling firms to enter IT markets without having to develop independently a complete package of technology assets.

2. Anti-Licenses: The Surprising Frequency of Intellectual Property Giveaways

The license-as-tax approach assumes that IP holders can and will impose maximal royalties on intermediate users, which in turn translates into high prices for consumers. Even assuming an IP holder exercises market power, probably an atypical case outside the pharmaceutical markets, as discussed further below.[188] This view ignores the reasonable possibility that repeat-play IP holders may expect to maximize long-term revenues by fully or partially giving away their patented technology assets. Historically, the holders of valuable IP assets have often adopted this strategy. Notable examples include

185. Letter from Charles A. James, Assistant Att'y Gen., Antitrust Div., U.S. Dep't of Just., to Ky P. Ewing, Vinson & Elkins LLP (Nov. 12, 2002), https://www.justice.gov/sites/default/files/atr/legacy/2006/04/27/200455.pdf (concerning proposed structure for 3G Patent Platform Partnership); Letter from Joel I. Klein, Assistant Att'y Gen., Antitrust Div., U.S. Dep't of Just., to Garrard R. Beeney, Sullivan & Cromwell (Dec. 16, 1998), https://www.justice.gov/archive/atr/public/busreview/2121.htm (concerning proposed structure for DVD patent pool); Letter from Joel I. Klein, Assistant Att'y Gen., Antitrust Div., U.S. Dep't of Just, to Carey R. Ramos, Paul, Weiss, Rifkind, Wharton & Garrison (June 10, 1999), https://www.justice.gov/sites/default/files/atr/legacy/2012/08/01/2485.pdf (concerning proposed structure for DVD patent pool).

186. Barnett, *From Patent Thickets*, *supra* note 172, at 20.

187. *Id.* at 37–38.

188. *See infra* Part IV.A.

such "crown jewel" IP assets as the transistor (released by AT&T), the Ethernet (released by Xerox, Intel and DEC), the USB interface (released by Intel), the Java programming language (released by Sun Microsystems,) and Bluetooth technologies (released by multiple firms acting through a consortium).[189] An additional example of a partial giveaway is Microsoft's decision to provide zero-fee access to the application programming interfaces ("APIs") to the Windows operating system in order to induce outside developers to write Windows-compatible applications. All these IP assets were released at a zero-royalty rate, subject to limited contractual conditions, with the partial exception of the transistor, which was licensed at what was widely perceived to be a modest one-time royalty fee.[190]

These giveaway licensing strategies, which often rely on the underlying IP right to enforce the license's non-price term, share a cogent economic rationale. Under certain conditions, firms can expect to maximize long-term revenues by licensing a valuable technology broadly and at a low or zero rate. Those circumstances tend to arise in markets that inherently converge upon a single standard, in which case IP asset owners have a strong incentive to avoid being the "losing" standard by rapidly seeding adoption through a zero or low-royalty strategy, with the expectation of extracting royalties from a large user population or sourcing revenues indirectly through the sales of complementary goods and services. Those incentives are strengthened further in the case of repeat-play licensors, who may seek to maximize long-term licensing revenues over the course of multiple technology releases, such as 3G, 4G and so on in the context of the smartphone market, by maintaining a reputation for "fair" pricing in any given iteration of the relevant technology. Contrary to the license-as-tax view, there is no necessary basis to assume that licensing will always be used as a tool by which to limit access and to increase prices for intermediate and end-users, even in the case in which an IP owner holds an especially valuable technology and would otherwise appear to be immune to price discipline. In many circumstances, the IP holder's profit-maximization incentives will lead it to favor low or even zero licensing rates, which in turn minimizes the access costs and associated deadweight losses that are typically attributed to IP licensing arrangements.

189. Jonathan M. Barnett, *The Host's Dilemma: Strategic Forfeiture in Platform Markets for Informational Goods*, 124 HARV. L. REV. 1861, 1871–72 tbl.1 (2011). For related discussion of zero-royalty licensing strategies, see Eli Greenbaum, *Puzzles of the Zero-Rate Royalty*, 27 FORDHAM INTELL. PROP., MEDIA & ENT. L.J. 1 (2016).

190. Although AT&T's transistor technology was subject to a compulsory licensing order in a 1956 consent decree, the firm had distributed the technology to all interested parties at "below-market" royalty rates prior to that time, together with complementary know-how. *See* Richard C. Levin, *The Semiconductor Industry*, *in* GOVERNMENT AND TECHNICAL PROGRESS: A CROSS-INDUSTRY ANALYSIS 9, 75 (Richard R. Nelson ed., 1982).

IV. REVISITING THE "LICENSE AS TAX" ANALOGY

In the "IP = monopoly" model on which much of IP scholarship and commentary relies, the licensing royalty is often represented as being at least in part a windfall to the IP owner—that is, a payment in excess of the consideration required to incentivize the investment that generated the relevant innovation.[191] This is the core contention of the license-as-tax approach and the key motivating concern behind the long-standing tradition of IP skepticism in patent and antitrust case law, scholarship, and commentary. This argument is vulnerable on two grounds. First, it is *atypically* the case that IP rights confer the ability to extract significant rents from users of the underlying intellectual asset, given competition from other technologies and other offsetting factors. Second, even in cases in which the IP owner can exercise pricing power as envisioned in the textbook economic model, the resulting efficiency losses from constrained output must be offset against the efficiency gains attributable to robust IP protections, in the form of both increased innovation and ancillary products and services that are enabled by a particular innovation. A nuanced welfare analysis of IP licensing therefore necessitates case-specific factual inquiry into the extent to which a particular IP owner is sheltered from competitive discipline and, assuming this predicate condition is satisfied, a careful balancing of the positive and adverse competitive effects of any particular licensing practice. Antitrust analysis that departs from this factually intensive approach is prone to cause social harm by suppressing efficient licensing and related IP-dependent arrangements and impeding entry by vertically disintegrated and innovation-intensive firms that rely on licensing structures to earn returns on R&D investments. These arguments are principally illustrated by reference to antitrust actions concerning licensing practices in wireless device markets and the Court's decision in *Impression Products* concerning the patent exhaustion doctrine.

191. More extreme versions of this proposition characterize licensing fees as being mostly or entirely a windfall payment made under coercive circumstances. *See, e.g.*, Feldman & Lemley, *supra* note 2 (describing survey of a limited sample of in-house counsel, finding that external patent licensing and litigation demands typically do not lead to a settlement or license, but rather, are most commonly either ignored or declined, and observing that the results suggest that "ex post" patent licenses generally do not promote technology transfer). Setting aside the methodological imitations inherent to the study's small response sample and the absence of statistically significant results (which the authors acknowledge, see *id.* at 139, 148–49), I note that the scenario addressed in this study—an adversarial "cold call" demand by an unknown third-party patentee, supported by the threat of litigation (or, in some cases, following the filing of a lawsuit)—has little in common with the much larger pool of IP licensing transactions in content and technology markets, which consist of a friendly arm's-length negotiation among potential business partners who hold complementary IP and non-IP assets and are often negotiating a larger investment, joint venture, or other long-term relationship.

A. *The Intellectual Property Monopolist Assumption*

The license-as-tax approach is ultimately a special application of the "IP = monopoly" equation that underlies the standard economic analysis of IP rights and is reflected in the "monopoly" rhetoric that often appears in judicial opinions relating to IP rights.[192] This framework treats the patentee as a monopolist that exercises pricing power and can dictate the terms of use of its technology, necessarily resulting in the deadweight losses associated with monopoly pricing. While this theoretical framework expediently leverages existing formal models for assessing the welfare effects of monopoly pricing, policymakers and scholars often do not give due attention to the fact that it is inconsistent with empirical evidence showing that patents do not consistently confer pricing power and, in most cases, have low to nominal commercial value.[193] As Richard Posner once noted: "The monopolistic effects of patents are exaggerated . . . . A legal monopoly is not necessarily an economic monopoly; if close substitutes exist for a patented product, the patent may confer little power over price."[194]

These observations are consistent with various bodies of evidence indicating that the value of patents is highly variable across individual patents, technologies, stage of development, industries, and firm types. Two landmark survey studies conducted in the 1980s and 1990s (known respectively as the "Yale" and "Carnegie-Mellon" surveys) found that large U.S. firms that engage in R&D outside the pharmaceutical and chemicals industries tended to place patents toward the bottom of the "pecking order" of mechanisms (including both IP rights and other non-IP assets) by which to extract returns from innovation.[195] Hence, if these firms enjoy monopoly rents, this apparently is substantially attributable to instruments other than IP rights that enable these firms to capture returns on innovation. This implication is consistent with a widely cited study that estimates the "patent premium," defined as the increase in the value of an innovation attributable to patenting it.[196] That study

192. On the use of "monopoly" rhetoric in IP jurisprudence, see *supra* notes 1–2; on the role of the monopoly analogy in the economic analysis of IP rights, see *supra* notes 21–23.

193. On the extreme skew in patent values, see Dietmar Harhoff, Frederic M. Scherer & Katrin Vopel, *Exploring the Tail of Patented Invention Value Distributions*, *in* ECONOMICS, LAW AND INTELLECTUAL PROPERTY: SEEKING STRATEGIES FOR RESEARCH AND TEACHING IN A DEVELOPING FIELD 279 (Ove Granstrand ed., 2003); Scherer & Harhoff, *supra* note 164.

194. Richard A. Posner, *Intellectual Property: The Law and Economics Approach*, 19 J. ECON. PERSPS. 57, 68 (2005). As noted previously, Edmund Kitch made a similar observation. *See supra* note 168 and accompanying text.

195. For the leading studies, see Wesley M. Cohen, Richard R. Nelson & John P. Walsh, *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)* (Nat'l Bureau of Econ. Rsch., Working Paper No. 7552, 2000); Richard C. Levin, Alvin K. Klevorick, Richard R. Nelson & Sidney G. Winter, *Appropriating the Returns from Industrial Research & Development*, 3 BROOKINGS PAPERS ON ECON. ACTIVITY 783, 784 (1987).

196. Ashish Arora, Marco Ceccagnoli & Wesley M. Cohen, *R&D and the Patent Premium* 1 (Nat'l Bureau of Econ. Rsch., Working Paper No. 9431, 2003).

finds that the premium is only positive on average in a few industries, although there is significant variance in the size of the premium across individual patents and across industries.[197] Consistent with the Yale and Carnegie-Mellon survey studies, the highest premiums are observed in the biotechnology, medical device, and pharmaceutical markets.[198] Approximately the same result emerges in royalty rate studies, based on surveys of licensing professionals and large samples of material contract filings with the SEC, which find that royalties in transactions involving life sciences innovations are generally materially higher than transactions involving innovations in other fields.[199] The more recent "Berkeley" survey of smaller and emergent U.S. firms finds that, unlike the larger firms surveyed in the Yale and Carnegie-Mellon studies, these firms tend to ascribe a high relative value to patent protection as compared to other appropriation instruments in certain industries, in particular, biotechnology, medical devices, and information technology hardware markets, and an even broader range of industries in the case of firms that are backed by venture capital.[200] Those findings suggest that IP rights are more valuable for smaller firms and, especially, smaller firms that rely on venture capital.

In the aggregate, the existing body of relevant evidence suggests that the "IP = monopoly" assumption has a limited but practically meaningful scope of application in real-world innovation environments. In particular, patents are most likely to confer pricing power or some other commercially valuable advantage for (i) all firms in the biopharmaceutical markets and (ii) for smaller firms, especially venture capital-backed firms, in a broader range of industries, including but not limited to the medical device and information technology hardware industries. In the case of smaller firms, the pricing power or other commercial advantage attributable to IP rights is attractive from a competition policy perspective since it enhances those firms' ability to challenge incumbents that enjoy lower-cost access to non-IP-based

197. *Id.* at 35.

198. *Id.* at 30.

199. Stephen L. Becker & Jiaqing Lu, *Royalty Rate and Industry Structure: Some Cross-Industry Evidence* (Applied Econ. Consulting Grp., Working Paper, 2009), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1447997 (using RoyaltySource database, which relies principally on material contract filings with the SEC, and reporting estimated ranges of average royalty rates during 2007 of 4 to 6% for consumer goods, computing hardware, chemicals, telecom and semiconductor industries and 8% for the pharmaceutical industry). A survey of technology transfer transactions in the life sciences (mostly involving academic and other nonprofit licensors) during 2018 found median royalty rates of 5% for earlier-stage technologies and 13.3% for later-stage technologies that were close to market launch. LICENSING EXECS. SOC'Y, INC., GLOBAL "LIFE SCIENCES" ROYALTY RATES & DEAL TERM SURVEY 2018 8 (2019).

200. Stuart J.H. Graham, Robert P. Merges, Pamela Samuelson & Ted M. Sichelman, *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255 (2009).

mechanisms for securing market rents.[201] To be clear, these findings should not be interpreted to suggest that patents typically lack any significant positive marginal value for larger firms outside the life sciences, especially given the high observed variance in the values of individual patents[202] and royalty rates across individual patents.[203] Rather, the relevant body of evidence supports the more modest observation that any blanket characterization of patents as a monopoly franchise is inconsistent with the complexity of real-world innovation environments, in which the incremental pricing power reasonably attributable to a patent is often relatively modest and can vary significantly across technologies, firm types, and industries. If that is the case, then reflexively applying monopoly pricing models "across the board" without context-specific inquiry is prone to yield erroneous conclusions that tend to overestimate the deadweight losses and other social costs attributed to IP rights and IP-dependent transactions. This analytical bias is likely in turn to yield a policy bias toward reducing the strength of IP rights, which places at risk the innovation capacities of market segments and firm types for which IP rights provide a potent and critical mechanism for rendering innovation an economically rational activity.

B. *How False Assumptions Lead to False Positives*

Much of patent and antitrust law relating to IP licensing endorses the proposition that the mere existence of IP rights is a poor proxy for pricing power. Examples include: the Patent Misuse Reform Act of 1988, which required a showing of market power in the tying product market;[204] the 1995 Guidelines, which rejected any presumption that a patentee enjoys market power;[205] the 2017 Guidelines that reaffirm that position;[206] and the Supreme Court's 2006 decision in *Illinois Tool Works Inc. v. Independent Ink, Inc.*, which rejected any such presumption for purposes of antitrust law.[207] Each of these legal pronouncements required that market power be shown, rather than simply assumed or even presumed. Since it appears that a largely unrestrained IP monopolist is not the typical case, with the exception of the biopharmaceutical market and even in that market, some portion of a patentee's "market

201. For discussion of this thesis, see BARNETT, *supra* note 161, at 37–39, 43–44, 115–20, 123–26; Jonathan M. Barnett, *Three Quasi-Fallacies in the Conventional Understanding of Intellectual Property*, 12 J.L. ECON. & POL'Y 1, 18 (2016) [hereinafter Barnett, *Three Quasi-Fallacies*]; Jonathan M. Barnett, *Is Intellectual Property Trivial?*, 157 U. PA. L. REV. 1691, 1731–37 (2009).

202. *See supra* notes 197–98 and accompanying text.

203. Roy J. Epstein & Paul Malherbe, *Reasonable Royalty Patent Infringement Damages After* Uniloc, 39 AIPLA Q.J. 3, 8–10 (2011).

204. 35 U.S.C. § 271(d)(5).

205. 1995 GUIDELINES, *supra* note 15, § 2.2.

206. 2017 GUIDELINES, *supra* note 15, § 2.2.

207. Ill. Tool Works Inc. v. Indep. Ink, Inc., 547 U.S. 28, 45–46 (2006).

power" may not properly reflect monopoly rents,[208] any attribution of market power to a patent owner must be grounded in firm evidence, with the exception of the clearest forms of horizontal collusion that are subject to per se liability.[209] Once market power is adequately demonstrated, then regulators and courts should deploy an appropriately calibrated rule-of-reason approach to assess whether the IP owner has used its market power to set licensing terms that have a net anticompetitive effect, taking into account that those terms may give rise to a mix of welfare-increasing and welfare-reducing effects. As set forth in the 1995 Guidelines, the weight of empirical evidence recommends that antitrust law should "regard intellectual property as being essentially comparable to any other form of property" and therefore "apply the same general antitrust principles to conduct involving intellectual property that . . . apply to conduct involving any other form of tangible or intangible property."[210]

The notion that "IP is nothing special" is being eroded by recent policy actions that rely heavily on theoretical assumptions rather than factual demonstrations of market power and anticompetitive harm. This puzzling lack of interest in the actual conditions of real-world markets (and existing empirical evidence showing that patents do not typically confer market power) can be illustrated by competition policy in the SEP licensing markets, which, as described previously, has relied almost entirely on theoretical models developed by scholarly commentators,[211] and, with the exception of DOJ Antitrust during November 2017 through January 2021,[212] still has not meaningfully taken into account the challenges to those models posed by a now well-developed body of empirical evidence. If it is presumptively assumed that a SEP owner enjoys a secure monopoly position as both a legal and

208. The parenthetical qualification deserves further clarification. The comparatively higher royalty rates paid for licenses to pharmaceutical patents may not entirely reflect market power but rather, reflect in part the fact that a pharmaceutical innovation is typically the result of exceptionally large R&D investments undertaken under an exceptionally low probability of success. A higher royalty rate therefore may appropriately compensate the successful innovator-entrepreneur for bearing these high costs and risks. Put differently: some portion of the royalty earned by a valuable pharmaceutical patent in the marketplace reflects "Ricardian" rents that reflect the scarcity of a particular resource (in this case, innovative acumen and the willingness to bear entrepreneurial risk), rather than a deliberate restriction of output. On the distinction between these two concepts of economic rent, and application to the entrepreneurial process, see Tay-Cheng Ma, *Accounting Profits and Ricardian Rents: An Application to Antitrust Enforcement*, 25 RSCH. L. & ECON. 15, 16–17, 33 (2012).

209. Broad. Music, Inc. v. C-BS, Inc., 441 U.S. 1, 19–20 (1979) (restricting the per se rule to a practice that "facially appears to be one that would always or almost always tend to restrict competition and decrease output").

210. 1995 Guidelines, *supra* note 15, §§ 2.0, 2.1.

211. *See supra* notes 98 and 146, in each case including accompanying discussion. For more extensive discussion of the interaction between the academic literature, regulatory actions and judicial outcomes concerning the antitrust treatment of SEPs and the FRAND commitment, see Barnett, *Has the Academy*, *supra* note 98, at 1324–38.

212. *See supra* note 97 and accompanying text.

economic matter, then these models' predictions of widespread patent holdup might at least initially seem credible. If implementers do not have cost-feasible non-infringing alternatives to the SEP owner's technology, then it would be expected that the SEP owner would exploit its monopoly franchise to capture the bulk of the economic value generated by the wireless communications market. Yet, as described previously, this does not appear to be the case. The royalty rates actually charged by SEP owners—the entities principally responsible for the underlying innovations behind 3G and 4G wireless technologies—represent a single-digit percentage of the revenues generated by the wireless device market,[213] while the bulk of the remaining value flows to dominant producers that occupy branded positions in the customer-facing device market. A 2017 paper released by the World Intellectual Property Organization estimated that all IP licensors collectively captured approximately five percent, while Apple individually captured approximately forty-two percent, of the average retail price of the iPhone 7 device.[214] As has been shown formally, these findings run counter to the outcome that would be expected if SEP holders in fact enjoy a monopoly position, in which case it is predicted that they would collectively capture approximately two-thirds of the value of the average smartphone device and smartphone retail prices would be several times higher than the prices actually observed in real-world markets.[215] Additionally, SEP royalty rates in wireless communications markets have held constant over time,[216] which is inconsistent with theoretical expectations that a SEP monopolist would exploit its purported pricing power as implementers incur the costs of deploying technology compatible with the SEP-governed standard and can no longer feasibly switch to any alternative technology.

The rush to judgment by competition regulators in SEP licensing markets highlights the importance of considering market-specific and firm-specific factors that appear to constrain the licensing terms that can be secured by even the holders of especially valuable IP-protected technology assets. If regulators had examined actual wireless markets in lieu of stylized theoretical models based on a license-as-tax analogy, three characteristics might have suggested that SEP licensing practices are likely subject to significant competitive discipline.

First, as discussed previously,[217] the conventional model overlooks the fact that leading SEP owners typically operate under a multi-period payoff

213. *See supra* note 151 and accompanying text.

214. Jason Dedrick & Kenneth L. Kraemer, *Intangible Assets and Value Capture in Global Value Chains: The Smartphone Industry* 14, 16–17 (World Intell. Prop. Org., Econ. Rsch. Working Paper No. 41, 2017).

215. Galetovic, Haber & Zaretski, *Anticommons Tragedy*, *supra* note 151, at 1550–51.

216. Alexander Galetovic & Stephen H. Haber, *SEP Royalties: What Theory of Value and Distribution Should Courts Apply?* 23 (Hoover Institution IP^2, Working Paper No. 19001, 2019).

217. *See supra* Part II.C.3.

maximization calculus, which incentivizes licensors to offer relatively modest royalty rates that both promote adoption of a new technology standard and accrue reputational goodwill that supports adoption in subsequent technology generations. Second, the conventional model ignores the fact that a non-vertically integrated SEP owner (the typical case) cannot credibly threaten to forfeit licensing revenue from leading branded device manufacturers that collectively represent a large portion of the global smartphone market. For example, as of the third quarter in 2021, Apple, Oppo, Samsung, Vivo and Xiaomi represented almost seventy percent collectively of worldwide unit sales.[218] Third, the conventional model ignores the fact that those same branded producers, especially given the minimal risk of an injunction under prevailing case law,[219] share a rational incentive to engage in "holdout" behavior by increasing negotiation time and costs, enlisting scrutiny by competition regulators, or commencing litigation, in each case with the objective of inducing the licensor to agree to a reduced royalty rate. During this time, the implementer has an inherent negotiating advantage since it continues to earn returns from sales of devices that use the innovator's technology while the innovator earns zero returns on its R&D investment while the dispute remains unresolved. This imbalance in negotiating leverage—or at the very least, the implausibility of a one-sided bargaining environment in which the SEP owner can dictate licensing terms to SEP users—is illustrated by Apple's tactics in its multi-venue litigations with Qualcomm, which shadowed the concurrent litigation against Qualcomm on similar grounds by the FTC. During 2017-2019, Apple reportedly withheld approximately seven billion dollars in outstanding royalties without any limitation on its existing use of Qualcomm's technology in its handset devices.[220]

In light of these characteristics of innovator-implementer interactions in real-world, rather than stylized, wireless device markets, it becomes far less credible to suppose that SEP owners are typically in a position to capture windfall gains by raising royalty rates above socially efficient levels. Rather, it may be more credible to suppose that, given the practical unavailability of injunctive relief, the R&D investments by innovators prior to standard selection and adoption, and the difficult-to-replicate suite of production and distribution assets held by leading implementers, it is SEP *users* who may be in a position to depress royalty rates *below* socially efficient levels.[221]

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218. *Smartphone Market Share*, IDC (Oct. 28, 2021), https://www.idc.com/promo/smartphone-market-share.

219. *See supra* notes 105–112 and accompanying text.

220. Edvard Petterson & Bill Callahan, *Qualcomm Says Apple Is $7 Billion Behind in Royalty Payments*, BLOOMBERG (Oct. 26, 2018), https://www.bloomberg.com/news/articles/2018-10-26/qualcomm-says-apple-is-7-billion-behind-in-royalty-payments.

221. For further discussion of the oligopsony risk posed by leading implementers in SEP licensing markets, see Barnett, *Antitrust Overreach*, *supra* note 102, at 229–35; Barnett, *Has the Academy*, *supra* note 98, at 1371–78; J. Gregory Sidak, *Patent Holdup and Oligopsonistic Collusion in Standard-Setting Organizations*, 5 J. COMPETITION L. & ECON. 123 (2009).

C. *Rereading Sylvania: The Competitive Virtues of Organizational Choice*

Contrary to what I have called the "IP is nothing special" principle, recent policy interventions in certain IP licensing markets rely, whether explicitly or implicitly, on the "IP = monopoly" equation in treating IP-protected assets as inherently posing an elevated risk of anticompetitive harm. This assumption, which runs counter to the principles forth in the 1995 and 2017 Guidelines,[222] recommends a low evidentiary bar for judicial or regulatory intervention in IP licensing arrangements, which in turn empowers regulators and courts to exercise broad discretion in undertaking actions to modify or undo those arrangements for the purpose of shielding the market against purportedly onerous licensing fees "imposed" by IP owners on intermediate and end-users. This weak factual hurdle can give rise to net welfare losses in any particular case in which legal intervention unravels or discourages value-creating transactions that efficiently assemble complementary sets of IP and non-IP assets without imposing any sufficiently offsetting competitive harm, if any at all. Over a longer time horizon, an antitrust regime that casts doubt on the legal security of IP licensing relationships can have broader adverse impacts on competitive conditions by discouraging entry by innovation-intensive firms that rely on contractual mechanisms to extract returns on innovation. Counterintuitively, a legal regime that seeks to "protect" intermediate and end-users by limiting IP owners' permitted range of licensing terms, together with general hostility toward the enforcement of underlying IP rights, is prone to promote a market structure characterized by high levels of concentration and low rates of entry.[223]

These potential counterproductive effects of prolonged antitrust intervention in IP licensing markets derive from the fact that certain types of firms—in particular, larger firms that exhibit the economies of scale and scope associated with an integrated production and distribution infrastructure—can more easily monetize R&D investments internally through "stand-alone" commercialization structures. This tends not to be the case for smaller firms that excel in innovation but often lack the production and distribution assets to move independently down the commercialization path and therefore must interact with third parties that can supply the necessary capital and technical inputs to reach market.[224] Given these entity-specific differences in capturing returns on innovation, a legal regime that disfavors IP licensing is prone to

222. *See supra* note 15.

223. For further discussion of the points raised in this Section, see BARNETT, supra note 160, at 23–30, 101–05; Barnett, *Three Quasi-Fallacies*, *supra* note 201, at 18–20.

224. For extensive discussion of this evidence, see Jonathan M. Barnett, *Do Patents Matter? Empirical Evidence on the Incentive Thesis*, *in* HANDBOOK ON LAW, INNOVATION AND GROWTH 178, 197–203 (Robert E. Litan ed., 2011). For related discussion, see BARNETT, *supra* note 169, at 28–30; Barnett, *Three Quasi-Fallacies*, *supra* note 201, at 17; and Barnett, *Intellectual Property as a Law of Organization*, *supra* note 158, at 803–11.

favor larger and more integrated firms over smaller and less integrated firms, potentially providing incumbents with a shield against competitive threats posed by smaller but more innovative entrants. If neither IP licenses nor the underlying IP rights are reliably enforced, then firms and innovators that would otherwise rely on licensing-based monetization strategies face three choices: (i) exit, (ii) secure the capital and expertise to construct an integrated production and distribution infrastructure, or (iii) seek acquisitions with, or employment at, firms that already maintain that infrastructure. Unless an innovator-firm can feasibly shift to strategy (ii), which is often a formidable task, the implicit limitation on the feasible menu of organizational forms for monetizing R&D in a weak-IP environment may distort market structures in a manner that protects incumbents, induces premature exit or acquisition, or discourages entry altogether.

As I explore in detail in a book-length analysis,[225] the history of market responses to changes in the strength of U.S. patent protections, including patent-related elements of antitrust law, has largely conformed to these theoretical expectations. In the multi-decade postwar period during which antitrust law narrowly constrained the range of enforceable IP licensing terms,[226] antitrust agencies regularly ordered compulsory licensing of patent portfolios[227] and courts generally did not enforce patents vigorously.[228] Innovation remained robust for at least part of this period and the country's largest corporations maintained renowned research labs that achieved breakthroughs in computing and communications technologies. However, innovation activities were mostly confined to the labs of a relatively small handful of large firms, as indicated by persistent concentration throughout this period of R&D expenditures among the country's largest firms.[229] Consistent with theoretical expectations, this may have reflected the fact that only larger firms were able to maintain the integrated production and distribution structures that were necessary to monetize R&D in an IP-hostile environment. However, this apparently successful adaptation may have hidden a policy failure in the form of suppressed innovation by hypothetical unobserved firms that could not expect to maintain capital-intensive and technically demanding end-to-end pathways from lab to market. For example, without robust enforcement of IP licenses or the underlying IP rights, a start-up would have expected difficulty negotiating the terms of developing a new product with a large integrated firm, the "hub and spoke" structure,[230] and the inventor of a new software tool would have expected difficulty licensing it among a broad population of

225. BARNETT, *supra* note 160, at 89–113. For discussion specifically of the period from the late New Deal through the 1970s, see Barnett, *Patent Grab*, *supra* note 28.

226. For discussion, see *supra* notes 36–37 and accompanying text.

227. *See supra* note 38 and accompanying text.

228. BARNETT, *supra* note 160, at 69–72.

229. *Id.* at 97–102.

230. *See* Part III.A.

intermediate users the "IP prospect" structure.[231] As a result, the potential founders of these firms would have anticipated difficulty in securing outside capital and would have elected to take up employment at a large integrated technology firm, the only viable organizational structure in a weak-IP legal environment. Rather than expanding access and reducing entry barriers, antitrust policies that sought to constrain the purported pricing power of IP licensors may have simply advantaged larger and more integrated firms that had the capacity to independently execute the innovation and commercialization process.

While not presented in these terms, the underlying logic of this argument was anticipated by *Continental T.V., Inc. v. GTE Sylvania Inc.*,[232] the landmark Supreme Court decision that is often regarded as having endorsed the economic approach to antitrust law and embedded it as the intellectual basis for federal antitrust case law, at a minimum with respect to vertical restraints.[233] In *United States v. Arnold, Schwinn & Co.*, decided in 1967, the Supreme Court addressed an antitrust challenge to a distribution system in which Schwinn, then a leading bicycle manufacturer, assigned exclusive territories to retailers that sold its products.[234] The Court held that whether or not these limitations on retail competition would be deemed per se violations of the antitrust laws depended on whether Schwinn sold and transferred title to the products to the retailer.[235] The plaintiff-friendly per se rule would only apply in vertical relationships in which the retailer purchased and took title to the products from Schwinn (that is, a "sale" transaction); otherwise, the defendant-friendly rule-of-reason standard would apply and courts would require evidence of competitive harm before deeming a territorial limitation to be anticompetitive.[236] In its *Sylvania* decision, decided only ten years later, the Court reversed its ruling in *Schwinn*, recognizing that the distinction between sale (per se treatment) and non-sale transactions (rule-of-reason treatment) reflected a wooden doctrinalism that lacked economic substance.[237] The Court's about-face embodied a functionalist approach that recognized that firms like Schwinn could effectively detour around the quasi-prohibition on territorial restrictions in sale transactions by dismantling the franchise structure and vertically integrating forward, which would then disadvantage small businesses that could otherwise have operated as independent franchisees. This would not only render moot the arbitrary distinction between "sales" and "non-sales" but, in doing so, would perversely advantage larger,

231. *See* Part III.B.
232. Cont'l T.V., Inc. v. GTE Sylvania Inc., 433 U.S. 36 (1977).
233. For related discussion of this point, see Barnett, *Why is Everyone Afraid*, *supra* note 26, at 142–44.
234. United States v. Arnold, Schwinn & Co., 388 U.S. 365, 370–71 (1967).
235. *Id.* at 382.
236. *Id.* at 379–81.
237. Cont'l T.V., Inc. v. GTE Sylvania, 433 U.S. at 51–59.

integrated firms while impeding entry by potential franchisees, who are likely to be individuals or smaller firms that face barriers to entry in the form of high capital and expertise requirements. The result would obviously run counter to the fundamental purpose of the antitrust laws in promoting competition. The court's insightful reasoning on this point is worth reading in full:

> We also note that per se rules in this area may work to the ultimate detriment of the small businessmen who operate as franchisees. To the extent that a per se rule prevents a firm from using the franchise system to achieve efficiencies that it perceives as important to its successful operation, the rule creates an incentive for vertical integration into the distribution system, thereby eliminating to that extent the role of the independent businessmen.[238]

The Court's 2017 opinion *Impression Products* constituted an anachronistic return, under the rubric of patent law's exhaustion doctrine, to the discredited reasoning of the *Schwinn* decision. Specifically, the *Impression Products* opinion rehabilitates approximately the same formalist distinction between "sales" and "non-sales," which is now replaced by the distinction between "sales" (exhaustion) and "licenses" (no exhaustion), that the Court had rejected in *Sylvania* four decades earlier.

The *Sylvania* court had it right. Preserving arbitrary distinctions between transactions that are formally structured as a "sale" or "license" as the basis for determining the legality of a use restriction makes little economic sense and, at least within the efficiency framework of modern antitrust law, little policy sense. Even more generally, *Sylvania*'s condemnation of what the Court then called "barren formalism"[239] applies to current arguments made by commentators and policymakers who seek to constrain IP licensing in order to "protect" consumers and follow-on innovators from the "excessive" power of the patent licensor but sometimes make little factual inquiry into whether or not the targeted practices plausibly cause, or, in markets that have been in operation for a considerable period of time, actually have caused, any net competitive harm. Even if concerns about patentee overreaching are plausible under certain stylized theoretical models that assume for analytical convenience market power, a one-period payoff-maximization structure and a low rate of technological obsolescence, there is little firm evidence to support the proposition that patent owners typically enjoy market power or, at least in long-term revenue-maximization models, even have rational incentives to deploy any such market power to impose "exorbitant" licensing fees or other one-sided terms on intermediate and end users. Any such strategy is likely to be self-defeating in the long run and, even in the short run, may fail to

238. *Id.* at 57 n.26.

239. *Id.* at 48 n.13 (citing Donald I. Baker, *Vertical Restraints in Times of Change: From* White *to* Schwinn *to Where?*, 44 ANTITRUST L.J. 537, 538 (1975)).

maximize revenues, especially, net of collection and enforcement costs, relative to a "low rate, broad base" pricing strategy.[240]

These considerations suggest that the license-as-tax analogy, and associated "IP = monopoly" equation, describes a special case and, as such, provides a poor guiding principle for the legal treatment of IP licensing practices in general. If so, then this is precisely the case in which antitrust law would instruct *not* to apply a per se-style rule, which is confined to practices that always or almost always result in net anticompetitive effects.[241] The higher administrative costs associated with some form of the rule-of-reason standard—which gives rise to considerable litigation-related costs that would be avoided under a simple per se prohibition—are likely to be worth incurring to avoid erroneously suppressing efficient licensing practices while still providing courts with the ability to target the minority of cases in which licensing practices have net anticompetitive effects.

As demonstrated by the core transactional structures discussed earlier,[242] IP licensing commonly enables a broad range of interfirm relationships that enable IP asset owners to extract returns from those assets without having to incur the costs of independently implementing the commercialization steps required to reach market. This vertically disintegrated structure enables entry at both upstream segments of the supply chain, by relieving R&D-specialists from having to acquire capital-intensive production and distribution capacities, and downstream segments of the supply chain, by relieving production and distribution specialists from having to acquire knowledge-intensive R&D capacities. As judicial and agency actions incrementally revert to New Deal and postwar skepticism toward IP licensing and, as a practical matter, erode the legal infrastructure that supports licensing transactions, the rich panoply of IP-dependent transactional mechanisms is liable to shrink as firms retreat from market-based contracting in favor of internal commercialization structures.

From a competition policy perspective, the consequences are likely to be counterproductive. Theoretically plausible but empirically undemonstrated interventions in IP licensing markets are likely to yield a legal regime that is hospitable for larger, integrated firms but unwelcoming for smaller or less integrated innovation-specialist firms that rely on licensing revenue in order to fund and monetize their R&D efforts. Counterintuitively, the result may be a market structure that is both less concentrated and more firmly protected against competitive entry. Regulatory and judicial interventions in IP licensing markets that do not suffer from any soundly evidenced form of market

240. For examples of the use of "low rate, broad base" strategies by licensors of critical patented technologies, see BARNETT, *supra* note 160, at 53 (describing licensing strategy of the pool that held critical patents over the sewing machine), and at 95–96 (describing licensing strategy of the owner of a patent over a critical petroleum refining process).

241. *See supra* note 209.

242. *See supra* Part III.

failure are not only factually unfounded—or, put most precisely, are unlikely to pass an expected cost-benefit analysis, taking into account false positive error costs—but may give rise to inefficient outcomes that run counter to competition law objectives.

V. CONCLUSION

While IP infringement litigation often takes the headlines in press coverage of technology and content markets and has attracted a disproportionate allocation of scholarly resources in the economic and legal literature on innovation markets, humdrum IP licensing relationships constitute the transactional plumbing without which those markets would function far less efficiently and, counterintuitively, would likely operate under more concentrated conditions. The communications and computing devices that are now a ubiquitous part of everyday life rely on a dense network of licensing relationships among a myriad of entities that together assemble the complementary package of innovation and non-innovation inputs that are required to deliver to consumers a technically and economically viable good at the retail point of sale.

Contrary to conventional assumptions in scholarly and policy commentary that rely on the license-as-tax analogy and associated "IP = monopoly" equation, both theory and evidence suggest that IP licenses in these multilevel supply chains are best understood not as an extractive tax but rather, as a facilitative mechanism that enables efficient transactions in informational assets, which in turn promotes the specialization of labor that is inherent to a well-functioning innovation ecosystem. If that is the case, then it may be time to rethink the recent renewal of skepticism toward IP licensing, the revival of per se-style rules of liability for certain licensing arrangements, and the campaign by competition regulators in the United States and elsewhere to rewrite licensing practices in information technology markets.