

**PATENT GROUPTHINK UNRAVELS**

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## I. INTRODUCTION

For some time, there has been a broadly held consensus among significant portions of the scholarly, policymaking, advocacy, and business communities concerning the U.S. patent system. Namely: the system is “broken” and must be fixed by raising the bar to obtain a patent and limiting the remedies and other protections afforded to patent owners when suing third parties for infringement. Widely-cited books published in the mid-2000s by economists and legal academics vigorously expressed this position, arguing that alleged overissuance and overenforcement of patents imperiled innovators and consumers.<sup>1</sup> Legal scholars and other commentators have often called for the abolition of patents on software innovations<sup>2</sup> and, in a widely discussed book, two prominent economists advocated for the abolition of patent protection in most industries,<sup>3</sup> stating dramatically that it is an “unnecessary evil.”<sup>4</sup>

These positions are generally motivated by a historical narrative of institutional decline. According to that narrative, the enactment of the

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1. See, e.g., ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT 2* (2004) (contending that establishment of the Federal Circuit in 1982 “has interpreted patent law to make it easier [sic] to get patents, easier to enforce patents against others, easier to get large financial rewards from such enforcement, and harder for those accused of infringing patents to challenge the patents’ validity”); JAMES BESSEN & MICHAEL MEURER, *PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 2* (2008) (noting that “industry executives have complained in growing numbers that the patent system is broken”); DAN L. BURK & MARK LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT 22* (2009) (noting that “it is simply easier to get a patent today than it used to be, and . . . we are granting patents on more obvious inventions than in the past”). For a contemporary contribution by a scholar who contested some of these patent-skeptical claims, see Rosemarie H. Ziedonis, *On the Apparent Failure of Patents: A Response to Bessen and Meurer*, *ACAD. MGMT. PERSPS.* 21 (Nov. 2008).

2. See, e.g., Colleen V. Chien, *Reforming Software Patents*, 50 *HOUS. L. REV.* 325, 352 (2013) (observing that “the idea of abolishing software patents has enormous popular appeal”); Ben Klemens, *Software Patents Don’t Compute*, *IEEE SPECTRUM*, (July 1, 2005), <https://spectrum.ieee.org/computing/software/software-patents-dont-compute> [<https://perma.cc/952T-JTRY>] (calling for abolition of software patents on grounds that it is not feasible to distinguish between software and patent-ineligible mathematical formulae); Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 *EMORY L.J.* 1025, 1025 (1990) (contending that “there is a basis in patent law for denying patents to computer program algorithms and to a number of other computer program-related innovations”).

3. MICHELE BOLDRIN & DAVID K. LEVINE, *AGAINST INTELLECTUAL MONOPOLY 7–11* (2008) (noting that the internet and jet engine were not “invented in hopes of securing exclusive rights . . . when monopoly over ideas is absent, competition is fierce — and . . . innovation and creativity thrive”).

4. *Id.* at 12 (noting the absence of evidence that “intellectual monopoly” leads to greater innovation and concluding that the costs of IP rights outweigh the benefits in most cases).

Bayh-Dole Act in 1980,<sup>5</sup> the establishment of the Court of Appeals for the Federal Circuit in 1982,<sup>6</sup> and the consequent rapid emergence of patentee-friendly case law, triggered an unwise “explosion” in patent applications, patent issuances, and patent infringement litigation that threatened to deter innovation and increase prices in consumer markets.<sup>7</sup> In some versions of this narrative, it is asserted that certain business interests, in conjunction with the patent bar, captured the Federal Circuit, leading to a body of case law that serves the interests of patent owners over the public.<sup>8</sup> Rather than promoting innovation, these commentators argued that the patent system in its reinvigorated form threatened to undermine it (or, in some versions, allegedly had already done so to some extent).

To address this perceived state of affairs, commentators widely proposed policy interventions to significantly reduce patents’ availability, scope, and enforcement remedies.<sup>9</sup> As this commentary migrated from academic publications to real-world advocacy by public-interest organizations, the patent defense bar, industry trade associations, and, perhaps most powerfully, significant segments of the “tech” industry,<sup>10</sup>

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5. Pub. L. 96-517, 94 Stat. 3015 (1980) (codified as amended at 35 U.S.C. §§ 301–307).

6. Federal Courts Improvement Act of 1982, Pub. L. 97-164, 96 Stat. 25 (1982) (codified as amended in scattered sections of 28 U.S.C.).

7. See sources cited *supra* note 1.

8. See Stuart Minor Benjamin & Arti K. Rai, *Fixing Innovation Policy: A Structural Perspective*, 77 GEO. WASH. L. REV. 1, 17–18 (2008) (observing the one-sided pro-patent approach of the Federal Circuit and attributing this tendency in part to capture by patent lawyers who “have an obvious interest in the maintenance of a relatively robust patent system”). For an example of how this view has migrated to more general policy commentary, see Timothy B. Lee, *How a Rogue Appeals Court Wrecked the Patent System*, ARSTECHNICA (Sept. 30, 2012, 4:30 PM), <https://arstechnica.com/tech-policy/2012/09/how-a-rogue-appeals-court-wrecked-the-patent-system/> [<https://perma.cc/Z6Z3-UDTD>], which argues that the Federal Circuit “wrecked the patent system” and “subvert[ed] the principles enunciated by the [Supreme Court]” by “making patents easier to obtain and enforce” and “exhibit[ing] a strong pro-patent bias.” For a dissenting view, see John M. Golden, *The Supreme Court as “Prime Percolator”*: A Prescription for Appellate Review of Questions in Patent Law, 56 UCLA L. REV. 657, 685–86 (2009), which recognizes that “disagreement among commentators about what the patent bar seeks” could “be used to explain virtually any shift in the law, regardless of its direction” and does not support “present contentions that the patent bar has captured the Federal Circuit.”

9. For similar observations, see David J. Kappos, *The Antitrust Assault on Intellectual Property*, 31 HARV. J.L. & TECH. 665, 673–80 (2018), which describes actions taken by antitrust regulators to limit ability to enforce standard-essential patents in the smartphone and information technology industries, on unverified grounds that these patents can be used to “hold up” licensees; and Maureen K. Ohlhausen, *Patent Rights in a Climate of Intellectual Property Rights Skepticism*, 30 HARV. J.L. & TECH. 103, 103 (2016), which states that “[a] movement is underway to dilute U.S. patents, which have recently been the object of unprecedented criticism.”

10. For empirical evidence on the support of large technology companies for weakening patent protections, see JONATHAN M. BARNETT, *INNOVATORS, FIRMS, AND MARKETS: THE ORGANIZATIONAL LOGIC OF INTELLECTUAL PROPERTY* 139–50 (2021) [hereinafter BARNETT, *INNOVATORS, FIRMS, AND MARKETS*], which provides data on firms’ IP policy preferences based on amicus brief filings at the Supreme Court from 2006 to 2016; and Jonathan M. Barnett, *Three Quasi-Fallacies in the Conventional Understanding of Intellectual*

it yielded concrete policy results. These include an extended sequence of patent-unfriendly Supreme Court decisions, starting with the *eBay Inc. v. MercExchange, LLC*<sup>11</sup> decision in 2006 (which rejected the historical presumption in favor of injunctive relief for prevailing patentees) and encompassing landmark decisions in 2012, 2013, and 2014 that substantially limited the scope of patentable subject matter.<sup>12</sup> Additionally, patent skepticism has been reflected in the America Invents Act (“AIA”), enacted by Congress in 2011,<sup>13</sup> and its subsequent implementation by the U.S. Patent & Trademark Office (“USPTO”) through the Patent Trial and Appeal Board (“PTAB”), which expanded opportunities to challenge the validity of issued patents. Even the Federal Circuit, long associated with a “strong patent” orientation,<sup>14</sup> now regularly issues decisions that reflect a far more circumspect approach toward the interpretation and application of the patent statute.<sup>15</sup>

The patent-skeptical approach adopted by policymakers can cause significant legal and economic effects that ripple through the various components of the patent system as well as the technology markets that rely on that system. Consider the Supreme Court’s 2014 opinion in *Alice Corp. v. CLS Bank International*.<sup>16</sup> Together with the Court’s 2012 opinion in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*,<sup>17</sup> *Alice* established an analytical framework for assessing the validity of patents that implicate the traditional judicial exclusion of “laws

*Property*, 12 J.L. ECON. & POL’Y 1, 29–39 (2016) [hereinafter Barnett, *Quasi-Fallacies*], which provides the same, for the period 2008–2015, together with qualitative data on firm lobbying activities concerning software and financial method patents.

11. 547 U.S. 388 (2006).

12. *See, e.g.*, *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208 (2014); *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576 (2013); *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66 (2012).

13. Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (codified as amended in scattered sections of 35 U.S.C.).

14. On the Federal Circuit’s historical shift toward strong patent enforcement in the period following its establishment, see BARNETT, INNOVATORS, FIRMS, AND MARKETS, *supra* note 10, at 72–75.

15. *See, e.g.*, *Am. Axle & Mfg. Inc. v. Neapco Holdings LLC*, 939 F.3d 1355, 1356 (Fed. Cir. 2019) (upholding invalidation of patent on automobile drive shaft, on ground that it claimed a law of nature); *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 770 (Fed. Cir. 2019) (upholding invalidation of a patent on a charging station on ground that claim language was directed at an abstract idea and would have preempted other inventions in the field); *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1375 (Fed. Cir. 2015) (applying the two-step *Mayo* test to invalidate a patent claiming a method to detect fetal abnormalities, on the ground that the method involved a natural phenomenon and did not comprise any additional inventive concept). On the growing split within the Federal Circuit, as reflected in increasingly divided decisions, see Shubha Ghosh, *A Court Divided*, 17 CHI.-KENT J. INTEL. PROP. 346, 346 (2018), which notes that “the splits within the Federal Circuit, as revealed in many *en banc* decisions,” are “one reason why patent law has taken up a larger part of the Supreme Court’s docket recently.”

16. 573 U.S. 208, 216 (2014) (describing the exclusion of abstract ideas from patentable subject matter and explaining its importance in preventing a patent owner from preempting an entire field of technological innovation).

17. 566 U.S. 66 (2012).

of nature, natural phenomena and abstract ideas” from patentable subject matter. As applied in lower-court litigation, the *Alice* decision has cast substantial doubt on the patentability of business-method and certain software-related patents, which inherently involve the application of mathematical algorithms and therefore potentially fall within the excluded category of abstract ideas. In the following five years through 2019, challenges to patent validity under Section 101 of the patent statute (the basis for the judicial exclusion of abstract ideas) grew dramatically — there were 838 federal court decisions concerning patent validity under Section 101, as compared to 101 such decisions in the five years preceding *Alice*.<sup>18</sup> Concurrently, litigation outcomes changed significantly: the Federal Circuit upheld Section 101 validity challenges with respect to 86% of patents contested on these grounds, and federal courts invalidated 781 patents in whole or in part.<sup>19</sup> By comparison, in the five years preceding *Alice*, only 41% of all patents contested under Section 101 were deemed invalid, resulting in the invalidation in whole or in part of only 77 patents.<sup>20</sup> During the same period, applicants reportedly abandoned more than 60,000 patent applications due to examiner rejections on subject-matter eligibility grounds.<sup>21</sup> These are nontrivial developments given that substantial percentages (according to one estimate, over 60% as of 2019)<sup>22</sup> of all utility patents issued by the USPTO comprise at least some software-related element and may therefore be exposed to some type of *Alice*-based patentability objection, either at the ex ante examination stage or the ex post litigation stage. Even though the Court in *Alice* did not heed calls to abolish software patents,<sup>23</sup> its decision as subsequently applied by the federal district courts, the Federal Circuit, and USPTO examiners has made it

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18. Robert Sachs, *Alice: Benevolent Despot or Tyrant? Analyzing Five Years of Case Law Since Alice v. CLS Bank: Part I*, IPWATCHDOG.COM (Aug. 29, 2019), <https://www.ipwatchdog.com/2019/08/29/alice-benevolent-despot-or-tyrant-analyzing-five-years-of-case-law-since-alice-v-cls-bank-part-i/id=112722/> [<https://perma.cc/2CMM-PNXW>].

19. *Id.*

20. *Id.*

21. *Id.*

22. Raymond Millien, *Six Years After Alice: 61.8% of U.S. Patents Issued in 2019 Were ‘Software-Related’ — up 21.6% from 2018*, IPWATCHDOG.COM (Feb. 17, 2020), <https://www.ipwatchdog.com/2020/02/17/six-years-alice-61-8-u-s-patents-issued-2019-software-related-21-6-2018/id=118986/> [<https://perma.cc/YXH5-3XPY>]. The author’s methodology relies on a search of software-related claims in all utility patents issued by the U.S. patent office in 2019. The definition of “software-related” claims follows the methodology applied by the U.S. Government Accountability Office in a 2013 report, see U.S. GOV’T ACCOUNTABILITY OFF., GAO-13-465, INTELLECTUAL PROPERTY: ASSESSING FACTORS THAT AFFECT PATENT INFRINGEMENT LITIGATION COULD HELP IMPROVE PATENT QUALITY 12 n.27 (Aug. 22, 2013). For further discussion of this methodological point, see Stuart Graham & Saurabh Vishnubhakat, *Of Smart Phones and Software Patents*, 27 J. ECON. PERSPS. 67, 73–78 (2013).

23. For an amicus brief to this effect, see Jason M. Schultz & Brian J. Love, *Brief of Amici Curiae Law, Business, and Economics Scholars in Support of Respondents in Alice Corp. Pty. Ltd., v. CLS Bank International*, et al., 4 N.Y.U. J. INTELL. PROP. & ENT. L. 358, 360 (2015),

difficult for software firms to rely on patents as a strategy for earning returns on research and development (“R&D”) investments.

These striking developments in the U.S. patent policy landscape point toward a single conclusion. IP skepticism (and, in some cases, rejectionism) has moved beyond the realm of academic discussion and achieved significant practical success as the leading intellectual force driving the trajectory of U.S. patent policy, encompassing the legislative, judicial, and regulatory branches of the federal government engaged in the making of patent law (including patent-relevant antitrust law).<sup>24</sup>

As I document elsewhere, the history of U.S. patent law consists of a series of alternating periods in which policymaking bodies (including antitrust regulators) have crafted patent protection of greater and lesser scope and strength on various parameters.<sup>25</sup> In this Article, I show that we currently stand at a historical juncture at which important elements of the patent system are exhibiting signs of a movement away from the IP skepticism that has dominated both the “patent conversation” and patent policymaking since approximately the mid-2000s. Some small but significant cracks have emerged in the existing policy consensus, as reflected in statements and actions by the Department of Justice, Antitrust Division (“DOJ Antitrust”), and the USPTO that have cast doubt on, or rejected outright, key elements of the conventional narrative. In remarks made in 2018, USPTO Director Andrei Iancu captured this current moment in U.S. patent history by observing that “the rhetoric surrounding the patent system has focused relentlessly on certain faults

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which argues that the Court should “hold that abstract ideas in the form of software are unpatentable and that mere computer implementation of those ideas do not create patentability.” For commentary calling on the Court to abolish software patents in the *Alice* decision, see, for example, Tim Worstall, *The Supreme Court Should Just Abolish Software Patents in Alice v. CLS Bank*, FORBES, (May 29, 2014, 2:52 PM), <https://www.forbes.com/sites/timworstall/2014/03/29/the-supreme-court-should-just-abolish-software-patents-in-alice-v-cls-bank/#1b31aa653f8a> [<https://perma.cc/UJV3-MQVF>]; and Alex Tabarrok, *Software Patents Are Not Good Property Rights*, MARGINALREVOLUTION (Mar. 1, 2014, 7:35 AM), <https://marginalrevolution.com/marginalrevolution/2014/03/software-patents-are-not-good-property-rights.html> [<https://perma.cc/PY3C-EDLV>].

24. For a detailed description of the manner in which academic commentary impacted antitrust policy and court decisions relating to standard-essential patents (“SEPs”), see Jonathan M. Barnett, *Has the Academy Led Patent Law Astray?*, 32 BERKELEY TECH. L.J. 1313, 1321–26 (2017) [hereinafter Barnett, *Has the Academy*], which notes that the academic theories of patent thickets, holdup, and stacking “have been substantively mentioned in major reports . . . by the FTC, DOJ, and U.S. Patent & Trademark Office (‘USPTO’) on antitrust and intellectual property matters,” and have “proliferated in court opinions,” including “the Court of Appeals for the Federal Circuit.”

25. BARNETT, INNOVATORS, FIRMS, AND MARKETS, *supra* note 10, at 65–88. For related discussions of the history of the patent system, see generally Mark A. Lemley, *The Surprising Resilience of the U.S. Patent System*, 95 TEX. L. REV. 1 (2016); and Robert P. Merges, *One Hundred Years of Solicitude: Intellectual Property Law, 1900–2000*, 88 CALIF. L. REV. 2187 (2000).

in, or abuses of, the system — instead of the incredible benefits the system brings to our nation” and urging that “we are at an inflection point with respect to the patent system.”<sup>26</sup>

This Article identifies some incremental but significant steps around this “inflection point” in moving toward a more even-handed implementation of the patent system and the inevitable tradeoff between promoting innovation incentives and preserving access for intermediate and end-users. Critically, this still-emergent shift in the trajectory of U.S. patent law and policy is grounded in a growing body of empirical research and associated theoretical rethinking that challenges settled assumptions that have driven much of the policy conversation among academic and other commentators, “patent reform” at the legislative level, and efforts to restrain the force of patent protections in the courts. In particular, I discuss recent research that finds surprisingly meager factual support for certain widely accepted assumptions behind the still-dominant patent-skeptical school of thought. Remarkably, available evidence indicates that these commonly held views either lack factual support or describe particular cases that do not clearly support broader assertions about the patent system in general. These include the following hypotheses:

- (1) the *patent holdup thesis*, according to which owners of standard-essential patents widely “hold up” producers and other intermediate users in information technology markets, resulting in exorbitant licensing fees and increased end-user prices;<sup>27</sup>
- (2) the *royalty stacking thesis*, according to which industries characterized by large numbers of patents and dispersed owners suffer from collectively inefficient licensing behavior that inflates prices, discourages entry, and constrains market growth;<sup>28</sup> and
- (3) the *junk patents thesis*, according to which most patent applications are approved with little examination by the USPTO, resulting in large numbers of erroneously issued and low-value patents, which then give rise to nuisance litigation.<sup>29</sup>

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26. Andrei Iancu, Director, U.S. Pat. & Trademark Off., Remarks at U.S. Chamber of Commerce Patent Policy Conference: Role of U.S. Patent Policy in Domestic Innovation and Potential Impacts on Investment (Apr. 11, 2018), <https://thompsonpatentlaw.com/director-iancu-remarks/> [<https://perma.cc/HQJ2-746Z>].

27. See *infra* Section II.A.1.

28. See *id.*

29. See *infra* Section IV.A.

Relatedly, I discuss the extent to which certain Supreme Court Justices now seem to be prepared seriously to entertain challenges to elements of the PTAB's post-examination mechanisms that may have an adverse impact on individual and small-firm inventors in particular. This increased judicial scrutiny has already been accompanied by refinements to both patent examination standards and post-examination processes at the USPTO that have incrementally enhanced the legal security of issued patents when exposed to third-party validity challenges.

To be clear, it is not my intention to argue that we are in the midst of a widespread revolt against the still-prevailing consensus that the patent system had been unwisely extended under the influence of the Federal Circuit and then wisely constrained by the Supreme Court, Congress, and the antitrust agencies. Relatedly, I note as of this writing that changes in leadership at DOJ Antitrust and the USPTO following the shift in presidential administrations in January 2021 may lead those entities to abandon this emergent policy shift. Similarly, it is unclear at present whether the announcement on May 5, 2021 by the Office of the U.S. Trade Representative that it would support through the World Trade Organization a waiver of IP protections for COVID-19 vaccines under the Trade Related Aspects of Intellectual Property Agreement represents a targeted policy action specific to the worldwide pandemic or a broader policy shift with respect to the patent system in general.<sup>30</sup> Rather, I am simply arguing that a significant portion of the policymaking community has begun to revisit the patent-skeptical consensus and has done so principally on the basis of empirical research suggesting that significant elements of that consensus reflect an inaccurate, over-determined, or unverified understanding of the U.S. patent system and its role in the innovation economy.

This last point is critical because it has sometimes been suggested that arguments in favor of robust IP protections are “faith-based”<sup>31</sup> —

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30. Office of the United States Trade Representative, Statement from Ambassador Katherine Tai on the Covid-19 Trips Waiver, May 5, 2021, <https://www.ustr.gov/about-us/policy-offices/press-office/press-releases/2021/may/statement-ambassador-katherine-tai-covid-19-trips-waiver> [<https://perma.cc/VFV2-BM2L>]. An additional and seemingly clerical action by the Biden Administration suggests it is reconsidering the SEP-related antitrust policies undertaken under the previous administration. Specifically, in April 2021, a 2020 revision by DOJ Antitrust to a previously issued business review letter concerning SSO SEP policies (for discussion, see *supra* note 67 and accompanying text) was moved from the “Business Review Letters” portion of the DOJ Antitrust website to an archive listing “comments to state and other organizations,” suggesting an implicit retraction of the revision. On this point, see Florian Mueller, *DOJ Downgrades Delrahim Letter to IEEE on Standard-Essential Patents: Inter-Agency Rapprochement with FTC on SEP Enforcement?*, FOSS PATENTS (Apr. 16, 2021), <http://www.fosspatents.com/2021/04/doj-downgrades-delrahim-letter-to-ieee.html> [<https://perma.cc/V2TQ-5UQT>].

31. Mark A. Lemley, *Faith-Based Intellectual Property*, 62 UCLA L. REV. 1328, 1332–37 (2015) (noting that the “outpouring of sophisticated empirical work on virtually every aspect of IP law,” which does not show “that IP is doing the world more good than harm,” has led participants in the IP debates “not to question their beliefs, or even to question the evidence,



meaning they lack any sound basis in fact. Others have argued that these arguments simply reflect ideological commitments or cultural predispositions toward strong property rights.<sup>32</sup> To the contrary, there is now a strong empirical and theoretical case as a matter of economic reasoning and analysis that the reduction in patent protections for over a decade has likely relied on overestimates — or at a minimum, inadequately supported estimates — of the social costs attributed to robust patent protection.<sup>33</sup> Remarkably, it appears that courts, legislators, and regulators that took significant steps starting approximately in the mid-2000s to weaken patent protection did so on the basis of insufficient empirical evidence to warrant such far-reaching changes in the property-rights structure of the innovation ecosystem. The increasingly evident mismatch between conventional wisdom and real-world evidence has already led some policymakers to reevaluate the status quo and, in some cases, to take incremental actions toward changing it. Puzzlingly, however, much of this empirical work has not yet been substantially integrated into “mainstream” IP scholarship and policy discussions. This Article seeks to correct that oversight.

The following discussion and analysis comprise three Parts. In Part II, I review the prevailing theories of patent holdup and royalty stacking concerning “standard-essential” patents in the smartphone and related electronics markets, empirical challenges to those theories, and recent policy shifts by certain regulators in the U.S. and elsewhere that reflect these challenges. In Part III, I review the Supreme Court’s 2018 decision in *Oil States Energy Services, LLC v. Greene’s Energy Group, LLC*<sup>34</sup> and, together with other related decisions, argue that the dissent authored by Justice Gorsuch signals the emergence of a constituency on the Court that has significant concerns about patentees’ lack of procedural protections in the PTAB’s reexamination process. In Part IV, I review the growing empirical challenge to the consensus view that the USPTO operates as a “rubber stamp” for patent applicants. I then show

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but to retreat to a belief system that doesn’t require evidence at all . . . [T]his retreat from evidence [is called] faith-based IP, both because adherents are taking the validity of the IP system on faith and because the rationale for doing so is a form of religious belief”).

32. Maggie Wittlin, Lisa Larrimore Ouellette & Gregory N. Mandel, *What Causes Polarization on IP Policy?*, 52 U.C. DAVIS L. REV. 1193, 1214, 1232–33 (2018) (hypothesizing that “hierarchical individualists . . . tend to favor free markets and the rights of business [and are] more likely to support strong patent rights if they believe they align with these values,” whereas “egalitarian communitarians view IP as supporting commerce and industry and increasing inequality, [and] will likely prefer weaker IP rights”).

33. For analysis of the evidence relating to patent holdup and royalty stacking hypotheses, see *infra* notes 94–99 and accompanying discussion, and for related theoretical infirmities, see *infra* notes 103–112 and accompanying discussion. For analysis of the evidence relating to the alleged issuance of low-value patents, see *infra* notes 160–177 and accompanying discussion.

34. 138 S. Ct. 1365 (2018).

how these evidentiary concerns have been reflected in recent refinements adopted by the USPTO to its patent examination standards and post-examination processes. A brief conclusion follows.

## II. FROM PATENT HOLDUP TO PATENT HOLDOUT

The clearest indication of a shift in the IP policy landscape can be found in important changes in the application of antitrust and patent law toward the enforcement of standard-essential patents (“SEPs”) in the smartphone and related consumer electronics markets. SEPs, which refer to patents that are declared to be “essential” to the implementation of a technology standard administered by a standard-setting organization (“SSO”),<sup>35</sup> are a foundational element of the innovation ecosystem that drives global smartphone markets. Without SSOs, which in turn rely on the patent-mediated exchange of information among innovators and implementers, consumer electronics markets would lack the interoperability among competing products that promotes user convenience and facilitates entry by producers and other firms.<sup>36</sup> It is hard to underestimate the dollar values at stake in the legal treatment of the patent portfolios and licensing arrangements that underlie SEP-dependent markets, which represent revenue streams in the billions of dollars annually. IDC, a leading market data analysis firm, estimates that, in 2021, there will be almost 1.4 billion unit shipments of smartphone devices, at an average sale price of about \$500 for a 4G-enabled device and over \$800 for a 5G-enabled device.<sup>37</sup> The even larger global market for products and services that rely in turn on those SEP licensing arrangements reflect economic values in the order of trillions of dollars annually.<sup>38</sup> It is therefore vital that we get patent policy “right” in this critical market.

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35. Jorge L. Contreras, *Essentiality and Standard-Essential Patents*, in *CAMBRIDGE HANDBOOK OF TECHNICAL STANDARDIZATION LAW — ANTITRUST, COMPETITION AND PATENT LAW 209* (Jorge L. Contreras ed., 2017).

36. For discussion of this point, see Jonathan M. Barnett, *Antitrust Overreach: Undoing Cooperative Standardization in the Digital Economy*, 25 *MICH. TECH. L. REV.* 163, 172–73 (2019) [hereinafter Barnett, *Antitrust Overreach*], which shows how interoperability reduces entry costs by relieving producers from having to assemble an independent “end-to-end” technology system.

37. *Global Smartphone Shipments Expected to Drop Nearly 10% in 2020, But a Strong 5G Push is Expected to Bring the Market Back to Growth in 2021*, *INT’L DATA CORP.* (Aug. 27, 2020), <https://www.idc.com/getdoc.jsp?containerId=prUS46802520> [https://perma.cc/8YEX-K3KW].

38. EUROPEAN COMM’N, COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE: SETTING OUT THE E.U. APPROACH TO STANDARD ESSENTIAL PATENTS 1 (2017) (noting that “[t]he estimated economic potential of IoT applications in devices for humans, homes, offices, factories, worksites, retail environments, cities, vehicles and the outdoors will be up to EUR 9 trillion per year by 2025 in developed countries”).

*A. The Big Shift*

For over a decade, courts and regulators in the U.S. and other commercially significant jurisdictions have adopted the view that the owners of SEPs, which include companies that have pioneered the technological advances behind the data-rich transmission that characterizes 3G and 4G wireless networks, pose a significant threat of “patent holdup” (defined below) to device producers and other firms that rely on having access to SEP-protected technologies. In the following discussion, I describe both the emergence of this consensus and its recent unraveling in light of policy changes at DOJ Antitrust and the USPTO.

## 1. The Regulatory Consensus

In 2007, the Federal Trade Commission (“FTC”) and DOJ Antitrust issued a report expressing concern that owners of SEPs relating to digital communications technologies were prone to engage in holdup behavior that would result in heavy licensing fees, which would then inflate device prices and stunt market growth.<sup>39</sup> Originating in academic publications, patent holdup theory posits that SEP owners can extract undeservedly high royalty rates from producers who have made sunk-cost investments in the relevant technology standard and have no other feasible technological alternative.<sup>40</sup> Additionally, the report identified the related risk of “royalty stacking” in which individually profit-maximizing SEP owners set royalty rates that result in a collectively inefficient licensing burden on producers and, indirectly, consumers.<sup>41</sup>

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39. U.S. DEP’T OF JUST. & FED. TRADE COMM’N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 8, 57 (2007) [hereinafter 2007 FTC/DOJ REPORT] (discussing patent holdup activity where “the patent rights necessary to commercialize a product are frequently controlled by multiple rights holders . . . [which] can increase the costs of bringing products to the market due to the transaction costs of negotiating multiple licenses, and greater cumulative royalty payments”).

40. For the leading academic contributions on this point, see Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2013–16 (2007), which notes that “input suppliers with market power” hold patents over essential inputs required by “a downstream firm . . . [and] may make it unprofitable for the downstream firm to conduct the R&D and incur the other costs necessary to develop the product in question . . . [because] it can be extremely costly, or even impossible, as a practical matter, to ‘re-design’ a product standard to avoid infringing a patented technology,” and Mark A. Lemley, *Ten Things to Do About Patent Holdup of Standards (and One Not To)*, 48 B.C. L. REV. 149, 152–53 (2007), which argues that holders of standard-essential patents on the component of a larger technology system can secure royalties “that are substantially greater than the actual inventive contribution of the particular patent.” For a detailed intellectual genealogy that traces the academic origins of these theories and the subsequent adoption of these theories by regulators and courts, see Barnett, *Has the Academy*, *supra* note 24, at 1321–61.

41. 2007 FTC/DOJ REPORT, *supra* note 39, at 95 (noting that “the cumulative royalties of all upstream holders have the potential to stifle follow-on innovation if they reach a level at which commercialization of the improvement is no longer profitable” as when “one company

In 2011, the FTC individually issued a report expressing similar concerns.<sup>42</sup> In 2013, DOJ Antitrust and the USPTO issued a statement continuing this same line of argument and suggesting that holdup risks could be mitigated by generally precluding SEP owners from seeking injunctive relief against alleged infringers.<sup>43</sup> Consistent with this general skepticism among policymakers toward SEPs and concerns about patent holdup, the influential Judge Richard Posner of the Court of Appeals for the Seventh Circuit ruled in *Apple v. Motorola* that SEP owners should be deemed to have waived the right to seek injunctive relief against infringers, excepting certain limited circumstances.<sup>44</sup> While the Federal Circuit later rejected any categorical bar on injunctive relief for SEP owners, it did state that “money damages are adequate to fully compensate [the patentee]” and endorsed the denial of injunctive relief in *Apple v. Motorola* because it found that there was insufficient evidence that the infringing party had been an “unwilling licensee.”<sup>45</sup> As a practical matter, it is therefore generally presumed today that owners

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comes in and asks for five percent, another company comes in and asks for five percent . . . all of a sudden you're . . . giving away a hundred and twenty percent, three hundred percent of your revenues to various patents”) (internal quotation omitted). The aggregate licensing burden imposed by all IP holders is collectively inefficient to the extent it exceeds the profit-maximizing point at which a marginal increase in price results in a net marginal loss due to the decline in demand. This is an application of the standard economic concept of “double marginalization.” For the classic source, see AUGUSTIN COURNOT, RESEARCHES INTO THE MATHEMATICAL PRINCIPLES OF THE THEORY OF WEALTH 99–116 (Nathaniel T. Bacon trans., The Macmillan Company 1897) (1838).

42. FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 5, 10, 15 (2011) (noting that by threatening an injunction, the patentee can “hold-up” the value of the patent based on the potential infringer’s vulnerability to sunk costs, and effectively obtain higher royalties than otherwise available “in a competitive technology market,” leading to “[higher] prices to consumers who lose the benefit of competition among technologies, and deter[r] innovation by manufacturers facing the risk of hold-up”).

43. U.S. DEP'T OF JUST. & U.S. PAT. & TRADEMARK OFF., POLICY STATEMENT ON REMEDIES FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY FRAND COMMITMENTS 4, 6 n.13 (2013) (noting that granting SEP owners injunctive relief may not serve the public interest because SEP owners “may gain market power and potentially take advantage of it by engaging in patent hold-up, which entails asserting the patent to exclude a competitor from a market or obtain a higher price for its use than would have been possible before the standard was set . . .”).

44. *Apple, Inc. v. Motorola, Inc.*, 869 F. Supp. 2d 901, 913–15 (N.D. Ill. 2012) (Posner, J., sitting by designation) (denying injunctive relief claim by SEP holder, Motorola, against infringer, Apple, on the grounds that “injunctive relief is indeed unavailable for infringement of a patent governed by FRAND” because “[b]y committing to license its patents on FRAND terms, Motorola committed to license the [patent] to anyone willing to pay a FRAND royalty and thus implicitly acknowledged that a royalty is adequate compensation for a license to use that patent”), *modified on other grounds*, 757 F.3d 1286 (Fed. Cir. 2014).

45. *Apple, Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1331–32 (Fed. Cir. 2014) (rejecting “a *per se* rule that injunctions are unavailable for SEPs,” but restricting injunctive relief in case of SEPs to “where an infringer unilaterally refuses a FRAND royalty or unreasonably delays negotiations to the same effect”).

of SEPs have a low to nominal likelihood of securing injunctive relief in patent infringement litigation.<sup>46</sup>

This judicial and regulatory policy trajectory across U.S. agencies and courts has exerted influence worldwide. Relying on the same patent holdup and royalty stacking theories that had motivated U.S. regulators' positions on SEP enforcement, competition regulators in other major commercial jurisdictions then similarly sought to limit SEP owners' enforcement and licensing capacities in global wireless communications markets.<sup>47</sup> In 2015, one of China's competition regulators brought suit against Qualcomm, a leading source of technological innovation<sup>48</sup> and SEP portfolio holder in the 3G and 4G wireless communications standards.<sup>49</sup> The regulator found that Qualcomm had engaged in "abuse of dominance" (including allegedly "excessive" pricing) and assessed a fine of \$975 million as part of a larger settlement that reduced royalty rates for local device producers.<sup>50</sup> Regulators in South Korea, Taiwan, and the European Union ("E.U.") similarly assessed significant fines (in some cases, however, reduced by appeal or settlement) against Qualcomm in connection with its licensing practices in 2016, 2017, and 2018, respectively.<sup>51</sup>

This pattern of interventionist enforcement on antitrust grounds, adopted across virtually all commercially significant jurisdictions in global wireless communications markets, has effectively converted SEPs into a special class of patent rights protected by the equivalent of a "liability rule," according to which the maximal remedy is some form of monetary damages, in lieu of a "property rule," according to which the remedy package consists of a mix of monetary damages and injunctive relief.<sup>52</sup> As explicitly illustrated by the rate reductions included in the settlement of Chinese competition regulators' enforcement action

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46. David L. Cohen, *Standard-Essential Patent Monetization and Enforcement*, IAM (Oct. 23, 2015), <https://www.iam-media.com/standard-essential-patent-monetisation-and-enforcement> [<https://perma.cc/DXE4-5EJ5>] ("[Injunctive] relief is difficult to obtain generally and almost impossible to obtain with respect to standard-essential patents in the United States.").

47. For detailed discussion, see Barnett, *Antitrust Overreach*, *supra* note 36, at 230–35.

48. See *id.* at 197, which provides data showing that Qualcomm owned 8.6% of all 5G-related patent families, as of 2018, and exhibited R&D intensity (R&D expenditures as percentage of net sales) of 23.8%, as of 2017. In both cases, Qualcomm outperformed all competitors.

49. *Id.* at 166.

50. *Id.* at 231–33.

51. *Id.* at 233.

52. For the classic source of these two types of legal entitlements, see Guido Calabresi & Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1090–92 (1972), which discusses differences between property rules and liability rules. For a discussion of contrasting views of patents as property rights or regulatory entitlements and taking the view that the U.S. patent system historically adopted a property-rights approach in contrast to then-prevailing English model based on a "public law" approach, see Adam Mossoff, *Institutional Design in Patent Law: Private Property Rights or Regulatory Entitlements*, 92 S. CAL. L. REV. 921, 928 (2019).

against Qualcomm, this regime shift threatens to substitute price determination by the marketplace — one of the key efficiency-enhancing features of an IP regime — with price determination by judicial and regulatory processes.

## 2. The Dissenters

On December 19, 2019, this progression toward a global liability-rule regime in standard-dependent wireless communications markets was interrupted by a significant turn of events. On that date, DOJ Antitrust, the USPTO, and the National Institute of Standards and Technology (“NIST”) issued a statement that rejected any “special rules” for SEPs, stating that these patents should not be treated differently than other patents as a matter of antitrust or patent law.<sup>53</sup> Additionally, the statement rejected the presumption that SEP owners can be deemed to have waived the statutory right to seek injunctive relief against infringers. Specifically, the statement expressed that

the agencies have heard concerns that the 2013 policy statement has been misinterpreted to suggest that a unique set of legal rules should be applied in disputes concerning patents subject to a F/RAND [fair, reasonable and non-discriminatory] commitment that are essential to standards . . . and that injunctions and other exclusionary remedies should not be available in actions for infringement of standards-essential patents.<sup>54</sup>

In making these statements, DOJ Antitrust and the USPTO effectively withdrew the 2013 statement and DOJ Antitrust must be understood to have separately retracted its support for much of the substance of its 2007 report with the FTC. This means that two out of three federal agencies that impact patent policy rejected a key intellectual foundation for over a decade’s worth of regulatory activity in the U.S. and other countries relating to the legal treatment of SEPs in wireless communications markets.

The December 2019 announcement reinforced and formalized remarks by DOJ Antitrust that started in November 2017, when Assistant

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53. U.S. DEP’T OF JUST., U.S. PAT. & TRADEMARK OFF., & NAT’L INST. STANDARDS & TECH., POLICY STATEMENT ON REMEDIES FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS 5 (2019) [hereinafter, 2019 JOINT STATEMENT] (noting that the remedies available in a patent case, “injunctive relief, reasonable royalties, lost profits, enhanced damages for willful infringement, and exclusion orders issued by the U.S. International Trade Commission . . . are equally available in patent litigation involving standard-essential patents”).

54. *Id.* at 4.

Attorney General Makan Delrahim, then the head of DOJ Antitrust,<sup>55</sup> had rejected the Division's prior positions concerning the allegedly elevated anticompetitive risks posed by SEP owners in public remarks.<sup>56</sup> In those and other statements, Delrahim noted the paucity of evidence for the patent holdup hypothesis, which in turn casts doubt on the Division's prior position that SEP owners should generally be barred from seeking injunctive relief against infringers.<sup>57</sup> Going further, Delrahim argued that a legal regime that precludes SEP owners from seeking injunctive relief could give rise to opportunistic patent holdout by alleged infringers.<sup>58</sup> The rationale is straightforward. Absent the limited possibility of being found to have willfully infringed (which would trigger treble damages under the patent statute),<sup>59</sup> a well-resourced infringer in a no-injunction environment will rationally decline a license and invite the patentee to litigate, with attendant costs and delays. In the worst-

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55. Assistant Attorney General Delrahim served as head of DOJ Antitrust from September 2017 through January 2021.

56. Makan Delrahim, Assistant Att'y Gen., U.S. Dep't of Just., Remarks at the USC Gould School of Law's Center for Transnational Law and Business Conference (Nov. 10, 2017) (contending that "competition policy has focused too heavily on the . . . hold-up problem" because the implementer can mitigate against hold-up by evaluating the royalty rates for new technology prior to investment).

57. Makan Delrahim, Assistant Att'y Gen., U.S. Dep't of Just., "Telegraph Road": Incentivizing Innovation at the Intersection of Patent and Antitrust Law, Address at the 19th Annual Berkeley-Stanford Advanced Patent Law Institute (Dec. 7, 2018) (revising a previous issued DOJ statement and asserting that "[s]ince injunctions against infringement frequently *do* serve the public interest . . . in maintaining a patent system that incentivizes and rewards successful inventors through the process of dynamic competition, enforcement agencies without clear direction otherwise from Congress should not place a thumb on the scale against an injunction in the case of FRAND-encumbered patents"); Makan Delrahim, Assistant Att'y Gen., U.S. Dep't of Just., The "New Madison" Approach to Antitrust and Intellectual Property Law, Keynote Address to University of Pennsylvania Law School (Mar. 16, 2018), *reprinted in* 1 J.L. & Innovation 1, 8–9 (2019) [hereinafter Delrahim, *The New Madison Approach*] ("[A]dvocates of using antitrust law to reduce the supposed risk of patent hold-up fail to identify an actual harm to the competitive process . . . . Antitrust law demands evidence-based enforcement, without which there is a real threat of undermining incentives to innovate. [Thus,] antitrust law should play no role in policing unilateral FRAND commitments where contract or common law remedies would be adequate.").

58. Makan Delrahim, Assistant Att'y Gen., U.S. Dep't of Just., *Broke . . . but Not No More: Innovation Policy and the Role of Standards, IP, and Antitrust*, Opening Remarks at the LeadersHIP Virtual Series (Sept. 10, 2020) (stating that enabling infringers to bring an antitrust cause of action against an SEP owner for pursuing injunctive relief "increases the perverse likelihood of 'hold-out'"); Delrahim, *The New Madison Approach*, *supra* note 57 ("[S]tandard setting organizations should not become vehicles for concerted actions by market participants to skew conditions for patented technologies' incorporation into a standard in favor of implementers because this can reduce incentives to innovate and encourage patent hold-out."). Somewhat ironically, the holdout scenario had been recognized to some extent in the now-withdrawn 2013 statement, *supra* note 43, at 7, which notes that, in situations where "the putative licensee is unable or refuses to take a F/RAND license and is acting outside the scope of the patent holder's commitment to license on F/RAND terms . . . an exclusion order could be appropriate."

59. 35 U.S.C. § 284 (stating that a court may assess damages up to three times the amount found by a jury). For the current standard under which a court may elect to activate this provision, see *Halo Electronics, Inc. v. Pulse Electronics, Inc.*, 136 S. Ct. 1923 (2016).

case scenario, the alleged infringer incurs legal fees plus a “reasonable royalty” damages award approximately equal to the licensing fees it would have paid in the first place. In best-case and “better-case” scenarios, respectively, the alleged infringer either succeeds in invalidating the patent, in which case the royalty rate is obviously eliminated, or compels a less well-resourced patentee to agree to a more favorable royalty rate and other licensing terms.

While these statements did not take the form of official policy guidance, the antitrust community typically views speeches by senior regulators as being indicative of the agency’s enforcement policy and intentions. This assumption was particularly well-founded in this case given that DOJ Antitrust subsequently put these words into action on at least three notable occasions.

### *B. Letter to American National Standards Institute*

In March 2018, DOJ Antitrust sent a letter to the American National Standards Institute, which accredits SSOs, indicating that it would be “skeptical of rules that SSOs impose that appear designed specifically to shift bargaining leverage from IP creators to implementers, or vice versa.”<sup>60</sup> This statement was clearly intended to alert SSOs that DOJ Antitrust would no longer welcome initiatives by these entities to adopt bylaws or other internal rules that would limit the ability of SEP owners to seek injunctive relief or, even more problematically from an antitrust perspective, to pre-specify the terms of the royalty licenses that could be negotiated between SEP licensors and licensees. (Both actions had been approved and encouraged by prior leadership at DOJ Antitrust.<sup>61</sup>) In cases where producers and other net technology users play a significant role in SSO governance, DOJ was suggesting that preemptively setting or influencing licensing terms could be deemed collusive behavior intended to reduce the cost of technology

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60. Letter from Andrew Finch, Principal Deputy Assistant Att’y Gen., to Patricia Griffin, Vice President and Gen. Counsel, ANSI, and Amy Marasco, Chair, IPRPC (Mar. 7, 2018) <https://www.justice.gov/atr/page/file/1043456/download> [https://perma.cc/LH4T-KPUZ] (quoting Delrahim, *supra* note 56).

61. In various “business review” letters issued to SSOs, prior DOJ Antitrust leadership had endorsed either pre-specified royalty caps, or other related specifications of royalty terms, in order to preemptively address patent holdup concerns. *See, e.g.*, Letter from Thomas O. Barnett, Assistant Att’y Gen., U.S. Dep’t of Just., Response to VMEbus International Trade Association (VITA)’s Request for Business Review Letter (Oct. 30, 2006); Letter from Thomas O. Barnett, Assistant Att’y Gen., U.S. Dep’t of Just., Response to Institute of Electrical and Electronics Engineers, Inc.’s Request for Business Review Letter (Apr. 30, 2007). In a contemporaneous speech, a senior DOJ Antitrust regulator had encouraged SSOs to specify royalty caps or to bar SEP owners from seeking injunctions. *See* Renata Hesse, Deputy Assistant Att’y Gen., U.S. Dep’t of Just., Remarks as Prepared for the ITU-T Patent Roundtable: Six “Small” Proposals for SSOs Before Lunch 7, 9 (Oct. 10, 2012), <https://www.justice.gov/atr/file/518951/download> [https://perma.cc/ZME5-MWZ2].



inputs (a possibility DOJ later explicitly identified in the 2019 joint statement).<sup>62</sup>

### C. Intervention in *FTC v. Qualcomm*

In May 2019 and February 2020, respectively, DOJ Antitrust unusually intervened in the district court and appeals court proceedings in the landmark antitrust suit brought by the FTC against Qualcomm. In both cases, DOJ Antitrust filed amicus briefs that rejected the FTC's position. In the view of DOJ Antitrust, the FTC's case rested on an empirically undemonstrated theory of patent holdup and threatened innovation in the semiconductor market by limiting innovators' ability to earn returns on their R&D investments.<sup>63</sup> These interventions were successful insofar as the district court's far-reaching order was initially stayed<sup>64</sup> and then, in August 2020, reversed by the Court of Appeals for the Ninth Circuit.<sup>65</sup>

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62. See 2019 Joint Statement, *supra* note 53, at 2 n.3. On the potential for buy-side collusion through SSO licensing guidelines, see generally J. Gregory Sidak, *Patent Holdup and Oligopsonistic Collusion in Standard-Setting Organizations*, 5 J. COMPETITION L. & ECON. 123 (2009).

63. Brief of the U.S.A. as Amicus Supporting Appellant and Vacatur at 4–6, Fed. Trade Comm'n v. Qualcomm Inc., 935 F.3d 752 (9th Cir. 2019) (No. 19-16122) (arguing that the court-ordered injunction requiring SEP owner Qualcomm “to re-negotiate its licenses with OEMs worldwide and to license all chip-supplier rivals on FRAND terms” should be vacated because the court did not show harm to competition, wrongly applied the Sherman Act “by mischaracterizing as ‘anticompetitive malice’ [Qualcomm’s] profit-maximizing behavior” of “electing to license OEMs rather than chip-supplier rivals,” and should not have issued an injunction without a hearing because it “improperly polices Qualcomm’s conduct across the globe and extends beyond markets in which the FTC alleged harm”); United States’ Statement of Interest Concerning Qualcomm’s Motion for Partial Stay of Injunction Pending Appeal at 6–7, Fed. Trade Comm’n v. Qualcomm Inc., 935 F.3d 752 (9th Cir. 2019) (No. 19-16122), 2019 WL 3306496, at \*2–3 (arguing that public interest in competition, innovation, and national security favors a stay because “the district court’s decision ignores established antitrust principles and imposes an overly broad remedy” that threatens “a reduction in Qualcomm’s leadership in 5G innovation and standard-setting, . . . [which] could significantly impact U.S. national security by enabling foreign-owned firms to expand their influence”) (internal quotation omitted); Statement of Interest of the U.S.A. at 3–6, Fed. Trade Comm’n v. Qualcomm Inc., 411 F.Supp.3d 658 (N.D. Cal. 2019) (No. 17-cv-00220), ECF No. 1487 (noting that a hearing “is vital in monopolization cases because the obligations courts impose often have far-reaching effects and can re-shape entire industries” and concluding that Qualcomm should be granted an evidentiary hearing if found in violation of the FTC Act because “an overly broad remedy . . . could reduce competition and innovation in markets for 5G technology and downstream applications that rely on that technology”).

64. Fed. Trade Comm’n v. Qualcomm Inc., 935 F.3d 752, 753 (9th Cir. 2019).

65. Fed. Trade Comm’n v. Qualcomm Inc., 969 F.3d 974, 987 (9th Cir. 2020).

*D. Update of Business Review Letter to IEEE*

In September 2020, DOJ Antitrust took the exceptional action of revising a “business review” letter<sup>66</sup> that had been issued in 2015 to the IEEE, a leading SSO.<sup>67</sup> The 2015 letter had reviewed favorably an update to IEEE’s policies that had significantly limited SEP owners’ ability to seek injunctive relief and had encouraged SEP owners to license at the component, rather than device, level.<sup>68</sup> In its 2020 revision, DOJ Antitrust withdrew both points, taking the view that (i) SEP owners have a right to seek injunctive relief and SSOs are advised not to limit such right,<sup>69</sup> and (ii) given that reasonable royalties in patent infringement litigation can be determined in “a variety of ways,” SSOs are advised not to require that SEP owners extract royalties at any particular point on the supply chain.<sup>70</sup> On the latter point, DOJ Antitrust specifically noted that basing royalties on end-product revenue is a common practice, reflecting the fact that this is often “the most effective method of estimating [an] asserted patent’s value.”<sup>71</sup> This is a direct rejection of positions advocated by DOJ Antitrust in the 2015 business review letter, which had explicitly endorsed a policy effectively mandating licensing at the component level.<sup>72</sup>

## 1. Towards an Adjusted Consensus

The policy shift implemented by DOJ Antitrust since late 2017 has been echoed and, to some extent, anticipated by a similar policy shift in certain jurisdictions outside the U.S. In the U.K. and the E.U., the highest courts in each jurisdiction have issued decisions, *Unwired Planet v. Huawei* in the Supreme Court of the United Kingdom in

66. A business review letter indicates to the recipient whether the proposed transaction is unlikely to trigger enforcement action by antitrust authorities. *See* Antitrust Division Business Review Procedure, 28 C.F.R. § 50.6 (2021).

67. Updated Response to IEEE’s Request for Business Review Letter from Makan Delrahim, Assistant Att’y Gen., U.S. Dep’t of Just. (Sept. 10, 2020) [hereinafter Updated Response]. This action is exceptional because the DOJ does not generally revise or withdraw previously issued business review letters.

68. Response to Institute of Electrical and Electronics Engineers, Inc. from Renata B. Hesse, Assistant Att’y Gen., U.S. Dep’t of Just., (Feb. 2, 2015).

69. Updated Response, *supra* note 67, at 3–6.

70. *Id.* at 7–8 (citing *Exmark Mfg. Co. v. Briggs & Stratton Power Prod. Grp., LLC*, 879 F.3d 1332, 1348 (Fed. Cir. 2018)).

71. *Id.* at 7 (quoting *Commonwealth Sci. & Indus. Rsch. Org. v. Cisco Sys., Inc.*, 809 F.3d 1295, 1303–04 (Fed. Cir. 2015)).

72. *See* Hesse, *supra* note 68, at 12–13 (approving policy adopted by SSO encouraging holders of essential patents to license at the level of “the smallest saleable Compliant Implementation that practices the Essential Patent Claim,” especially in the case of multi-component technologies).

2020<sup>73</sup> and *Huawei v. ZTE* in the Court of Justice of the European Union in 2015,<sup>74</sup> that restore to a certain extent the possibility of injunctive relief for SEP owners. Subject to certain granular differences, these decisions adopted the principle that an SEP owner is entitled to seek an injunction without triggering antitrust liability in the event a potential licensee either refuses to engage in negotiations over a license or refuses to accept a FRAND-compliant licensing offer.<sup>75</sup> In May 2020, the German Federal Court of Justice adopted the same principle and went a step further by specifically requiring that an implementer take active and timely steps to engage in licensing negotiations, rather than simply making a nominal statement that it is “willing” to license on FRAND terms.<sup>76</sup> The “unwilling licensee” standard can apparently make a practical difference: in 2019, a U.K. court granted an injunction to an SEP owner on the grounds that the infringing party had engaged in “hold-out” behavior, rendering it an “unwilling licensee.”<sup>77</sup>

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73. *Unwired Planet Int'l Ltd. v. Huawei Techs. Co. Ltd.* [2020] UKSC 37 [61], *aff'g* [2018] EWCA (Civ) 2344 (Eng.).

74. Case C-170/13, *Huawei Techs. Co. Ltd. v. ZTE Corp.*, ECLI:EU:C:2015:477, ¶ 71 (July 16, 2015).

75. *Unwired Planet v. Huawei* [2020] UKSC 37, [61] (“The possibility of the grant of an injunction . . . is a necessary component of the balance which the [SSO’s] IPR Policy seeks to strike, in that it is this which ensures that an implementer has a strong incentive to negotiate and accept FRAND terms for use of the owner’s SEP portfolio.”); *Unwired Planet v. Huawei* [2018] EWCA (Civ) 2344, [57] (noting that if “the implementer refuses to enter into the FRAND licen[s]e for that jurisdiction then the SEP owner can properly seek an injunction to restrain further infringement”); Case C-170/13, *Huawei v. ZTE*, ¶ 71 (noting that prior to bringing a prohibitory injunction, the SEP-holder must “alert[] the alleged infringer . . . specifying the way in which it has [] infringed . . . [and] present[] to that infringer a specific, written offer for a licen[s]e on [FRAND] terms, specifying . . . the royalty and the way in which it is to be calculated”).

76. Henrik Holzapfel & Christian Dolling, *Landmark Judgment for German FRAND Law Published: Sisvel v. Haier*, MCDERMOTT, WILL & EMERY: INSIGHTS, (July 10, 2020), <https://www.mwe.com/insights/landmark-judgment-for-german-frand-law-published-sisvel-v-haier/> [<https://perma.cc/F9EE-FGWH>] (describing decision in Bundesgerichtshof [BGH] [Federal Court of Justice] May 5, 2020, FCJ docket no. KZR 36/17, <https://juris.bundesgerichtshof.de/cgi-bin/rechtsprechung/document.py?Gericht=bgh&Art=en&Datum=2020-5-5&nr=107755&pos=15&anz=17>). The German court subsequently reaffirmed its decision, see *Last and Final Victory for Sisvel Before the German Federal Supreme Court (BGH) in the Sisvel vs. Haier Cases*, BUSINESS WIRE, (Nov. 25, 2020), <https://www.businesswire.com/news/home/20201125005606/en/Last-and-Final-Victory-for-Sisvel-before-the-German-Federal-Supreme-Court-BGH-in-the-Sisvel-vs-Haier-Cases> [<https://perma.cc/DVE6-8HLA>], which describes the November 2020 decision by German Federal Supreme Court affirming its previous decisions in the *Sisvel v. Haier* litigation and declining Haier’s request for referral to the European Court of Justice.

77. *TQ Delta LLC v. ZyXEL Commc’ns Ltd.* [2019] EWHC (Pat) 745, [12] (Eng.) (concluding that ZyXEL engaged in “hold-out” by failing to pay royalties to TQ Delta, the SEP holder, and by “blow[ing] hot and cold as to whether they will accept whatever licen[s]e is considered by the Court to be RAND . . . [t]hey have refused to ‘agree to submit to the outcome of an appropriate [RAND] determination’ and yet have claimed the benefit of the RAND undertaking” (quoting *Unwired Planet* [2018] EWCA (Civ) 2344, [54])).

The *Huawei/ZTE* decision in 2015 seems to have influenced E.U. competition regulators to a certain extent. In a 2017 report, the European Commission recognized both implementers' concerns that SEP owners might charge royalties that were "too high" and innovators' concerns that SEP owners had bargaining leverage to negotiate royalties that were "too low."<sup>78</sup> A report issued in 2021 by a group of experts organized by the European Commission included similar observations.<sup>79</sup> The E.U.'s incremental policy shift was then mirrored in a 2018 statement by the Japan Patent Office, which similarly recognized the concerns of both patent holdup, as voiced principally by technology "implementers," and patent holdout, as voiced principally by "rights holders."<sup>80</sup>

Viewed in conjunction with the policy shift initiated by DOJ Antitrust in 2017 and then formally announced in a joint statement with the USPTO and NIST in 2019, there seems to be the tentative emergence of a modified international consensus in at least certain policymaking entities, including courts, competition regulators, and patent offices in the E.U., U.K., and U.S. Of course, there remain important exceptions to this trend: there are no indications of a policy shift at the FTC or (to my knowledge) recognition of patent holdout concerns by competition regulators in China, South Korea, and Taiwan, which have previously targeted allegedly anticompetitive SEP licensing practices. Among U.K. and E.U. courts, U.S. and E.U. competition regulators (again, the FTC being a notable exception), and U.S. and Japanese patent offices, however, one can identify an overlapping set of views that patent holdup and patent holdout are at least symmetrical risks faced respectively by IP licensees and licensors. That modified understanding of the competition issues raised by SEPs in turn recommends a more balanced policy approach that seeks to address both potential sources of efficiency losses in patent enforcement and licensing in standard-dependent information technology markets.

Table 1 summarizes the key milestones on the path toward this adjusted approach. This summary also highlights the extent to which the

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78. EUROPEAN COMM'N, *supra* note 38, at 2 (distinguishing the respective licensing and enforcement conflicts arising with SEPs where "[t]echnology users accuse SEP holders of charging excessive licensing fees based on weak patent portfolios and of using litigation threats [and] SEP holders claim that technology users 'free ride' on their innovations and consciously infringe intellectual property rights . . . without engaging in good faith licensing negotiations").

79. EUROPEAN COMM'N, GROUP OF EXPERTS ON LICENSING AND VALUATION OF STANDARD ESSENTIAL PATENTS, CONTRIBUTION TO THE DEBATE ON SEPs 28 (2021), <https://ec.europa.eu/docsroom/documents/45217/attachments/1/translations/en/renditions/native> [<https://perma.cc/6AZD-ZD69>].

80. JAPAN PAT. OFF., GUIDE TO LICENSING NEGOTIATIONS INVOLVING STANDARD ESSENTIAL PATENTS 1 (2018) ("With respect to SEP disputes, two issues which many are concerned about are 'hold-up' and 'hold-out' and there is controversy between rights holders and implementers over which of the two is more serious.>").

FTC's ongoing focus on patent holdup, as illustrated by the *FTC v. Qualcomm* litigation, stands at odds with the policy trajectory pursued by not only DOJ Antitrust (at least from November 2017 through January 2021), but also the highest courts in the E.U. and the U.K.

Table 1: The Global Policy Shift on Standard-Essential Patents

Year	Jurisdiction	Entity	Action/Statement
2015	E.U.	Court of Justice of the E.U.	Permits injunctions for SEP owners in case of unwilling licensee. <sup>81</sup>
2017	E.U.	European Commission	Recognizes patent holdup and holdout as symmetrical risks. <sup>82</sup>
2017	U.S.	DOJ Antitrust	Rejects focus on patent holdup and recognizes patent holdout as "more serious" risk. <sup>83</sup>
2018	U.K.	U.K. Court of Appeal	Permits injunctions for SEP owners in case of unwilling licensee. <sup>84</sup>
2019	U.K.	U.K. High Court	Issues injunction to SEP owner based on unwilling licensee principle. <sup>85</sup>
2020	Germany	German Federal Court of Justice	Recognizes SEP owners' right to seek injunctive relief, unless infringer declares willingness to reach FRAND license and actively engages in negotiations. <sup>86</sup>
2020	U.K.	U.K. Supreme Court	Affirms Court of Appeal's decision upholding SEP owners' right to injunctive relief, subject to "unwilling licensee" principle. <sup>87</sup>

81. Case C-170/13, *Huawei Techs. Co. Ltd. v. ZTE Corp.*, ECLI:EU:C:2015:477, ¶ 71 (July 16, 2015).

82. See EUROPEAN COMM'N, *supra* note 38, at 2.

83. See Delrahim, *supra* note 56.

84. *Unwired Planet Int'l Ltd. v. Huawei Techs. Co. Ltd.* [2018] EWCA (Civ) 2344 (Eng.), *aff'd* [2020] UKSC 37 [61].

85. *TQ Delta LLC v. ZyXEL Commc'ns Ltd.* [2019] EWHC (Pat) 745, [12] (Eng.).

86. Bundesgerichtshof [BGH] [Federal Court of Justice] May 5, 2020, FCJ docket no. KZR 36/17, <https://juris.bundesgerichtshof.de/cgi-bin/rechtsprechung/document.py?Gericht=bgh&Art=en&Datum=2020-5-5&nr=107755&pos=15&anz=17> [<https://perma.cc/L7S5-ZW4P>].

87. *Unwired Planet Int'l Ltd. v. Huawei Techs. Co. Ltd.* [2020] UKSC 37 [61], *aff'g* [2018] EWCA (Civ) 2344 (Eng.).

*E. Replacing Conjecture with Data*

It is important to appreciate that the shift in policy concerning SEPs, both in the U.S. and in other jurisdictions as described above, reflects a well-developed body of empirical research.<sup>88</sup> This body of research has done what academic, regulatory, and industry proponents of patent holdup and royalty stacking theories have never done. Namely, this research has subjected these widely-accepted theoretical assertions to empirical inquiry in order to verify that they provide an accurate picture of real-world innovation markets, rather than relying on stylized models in which a theory can never be more than “plausible” under “reasonable assumptions.” Puzzlingly, scholarly commentary that continues to view patent holdup and royalty stacking as material risks has generally declined to engage in detail with, or sometimes even fully cite, this body of empirical research, generally dismissing these findings on the grounds that they cannot exclude a counterfactual world characterized by both weaker SEP protections and even greater market efficiency.<sup>89</sup> Relatedly, patent holdup theorists have yet to deliver empirical evidence affirmatively showing that the

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88. For the principal empirical studies, see Alexander Galetovic & Kirti Gupta, *The Case of the Missing Royalty Stacking in the World Mobile Wireless Industry*, 29 *IND. & CORP. CHANGE* 827 (2020) [hereinafter Galetovic & Gupta 2020]; Alexander Galetovic, Stephen Haber & Lew Zaretski, *An Estimate of the Average Cumulative Royalty Yield in the World Mobile Phone Industry: Theory, Measurement and Results*, 42 *TELECOM. POL’Y* 263 (2018) [hereinafter Galetovic et al. 2018]; Alexander Galetovic, Stephen Haber & Lew Zaretski, *Is There an Anti-Commons Tragedy in the World Smartphone Industry?*, 32 *BERKELEY TECH. L.J.* 1527 (2017) [hereinafter Galetovic et al. 2017]; J. Gregory Sidak, *What Aggregate Royalty Do Manufacturers of Mobile Phones Pay to License Standard-Essential Patents?*, 1 *CRITERION J. INNOVATION* 701 (2016); and Keith Mallinson, *Cumulative Mobile SEP Royalty Payments No More Than Around 5% of Mobile Handset Revenues*, WISE HARBOR (2015), <http://www.wisearchor.com/pdfs/Mallinson%20on%20cumulative%20mobile%20SEP%20royalties%20for%20IP%20Finance%202015Aug19.pdf> [http://perma.cc/FZ8V-CB4P].

89. 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 studies that observe lack of evidence for patent holdup, citing only two of five major studies, and dismissing those studies’ validity largely due to the non-excludable possibility that “SEP holdup increased the price of cellular phones from what it otherwise would have been”); A. Douglas Melamed & Carl Shapiro, *How Antitrust Law Can Make FRAND Commitments More Effective*, 127 *YALE L.J.* 2110, 2111, 2117 (2018) (referring generally to empirical evidence that casts doubt on patent holdup, citing only one of five major studies, and dismissing the evidence due to the failure to “offer a sensible but-for world in the absence of opportunism [by IP licensors] as a comparator by which to assess observed behavior”). Other commentators more fully cite the empirical evidence but argue that patent holdup remains a pertinent concern in particular cases, while acknowledging that empirical evidence suggests it may not be a systematic phenomenon. See, e.g., 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 Holdup*, 2019 *ILL. L. REV.* 875, 896–98; Norman V. Siebrasse, *Holdup, Holdout, and Royalty Stacking: A Review of the Literature*, in *PATENT REMEDIES AND COMPLEX PRODUCTS: TOWARD A GLOBAL CONSENSUS* 294, 298–302 (C. Bradford Biddle, Jorge L. Contreras, Brian J. Love & Norman V. Siebrasse eds., 2019).

outcomes anticipated by these theories have been realized during the several decades in which the wireless communications markets have been in operation. This is not to say that these empirical studies are definitive or free from all possible doubt. To the contrary, following standard practice in the social sciences, the five major empirical studies on patent holdup and royalty stacking incorporate this uncertainty into their analytical framework, making conservative assumptions where data is unclear, acknowledging the potential incompleteness or inaccuracy of certain data, and not purporting to offer anything other than the most compelling interpretation of market performance based on available evidence.<sup>90</sup> No social science discipline can ever hope to meet any higher standard of proof given the inherent impossibility of conducting perfectly replicable natural experiments.<sup>91</sup> Additionally, some patent holdup theorists appropriately observe that we cannot exclude the hypothetical counterfactual that wireless communications markets might have performed even more efficiently if those markets had operated under greater constraints on SEP enforcement.<sup>92</sup> But the practically rel-

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90. See, e.g., Galetovic & Gupta 2020, *supra* note 88, at 831 (“[U]nder conservative parametrizations, royalty stacking theory predicts royalty yields that are more than order of magnitude larger than the observed royalty yield. Thus one cannot reject the null hypothesis that there is no royalty stacking.”); Galetovic et al. 2018, *supra* note 88, at 265–66 (providing estimate of the average cumulative patent royalty yield in the mobile phone value chain, stating that this provides a conservative estimate of the running royalty paid by each licensee, and noting that the study employed a methodology that biases upwards royalty estimates given widespread views that royalties are “excessive”); Galetovic et al. 2017, *supra* note 88, at 1533 (stating that the evidence shows that “patent holders in the world smartphone value chain do not exercise any meaningful monopoly power to raise prices to the levels that monopoly and royalty stacking theory predict” but acknowledging that “there may be geographic, product, or technology-based segments and niches within the world smartphone market where conditions may differ.”); Sidak, *supra* note 88, at 714 (“[T]he chief goal of this analysis is to determine whether it is possible for publicly available data to support a finding of a burdensome amount of aggregate royalties, using assumptions favorable to finding the existence of a royalty burden that would thwart implementation of the standard by manufacturers of handsets.”); Mallinson, *supra* note 88, at 10 (stating that the “majority of the cumulative royalty figure can be determined reasonably accurately and conservatively from major licensors’ disclosures and patent pool rate cards . . . [m]y bottom-line totals have modest but acceptable accuracy on [the] basis that the major licensors who disclose licensing income evidently receive significantly more in royalty payments than those in other categories”).

91. On the limits imposed by the impossibility of conducting natural experiments in the social sciences and some strategies to mitigate this constraint, see Alan S. Gerber & Donald P. Green, *Field Experiments and Natural Experiments*, in THE OXFORD HANDBOOK OF POLITICAL METHODOLOGY 357–81 (Janet M. Box-Steffensmeier, H. E. Brady & D. Collier eds., 2008).

92. See Shapiro & Lemley, *supra* note 89, at 2041–42; Melamed & Shapiro, *supra* note 89, at 2117. Note that, properly stated, this objection must assume a counterfactual world in which (i) SEP enforcement was more limited, (ii) prices of SEP-impacted products were lower, and (iii) innovative output in SEP-impacted industries was the same or higher. Generally speaking, most articulations of this objection omit condition (iii) or fail to specify an alternative incentive mechanism that would explain why innovative output would remain constant or increase if patent protection (and therefore the expected returns from innovation) were reduced.

evant question is which of the alternative interpretations has the greatest explanatory power with respect to all available evidence when considered in the aggregate.<sup>93</sup> That is: do we tend to observe strong indications of patent overreach, which would justify significant limitations on SEP enforcement and licensing, or rather do we tend to observe strong indications of market success even under patent-intensive conditions, which would warrant few if any such limitations? Given the overwhelming weight of observed performance in the wireless communications markets over a period of more than two decades, which indicates a statically and dynamically efficient market in which output is expanding, prices adjusted for quality are declining, and innovation is proceeding robustly,<sup>94</sup> patent holdup and royalty stacking models simply do not provide the most likely account.

### 1. Testing the Model

Scholars advancing royalty stacking theories had argued that profit-maximizing SEP owners would generate an aggregate royalty burden that would dramatically inflate device prices in the end-user market.<sup>95</sup> The evidence behind these arguments either relied on anecdotal reports or added up publicly announced royalty rates indicating that SEP owners were collectively charging smartphone producers aggregate royalty burdens representing double-digit percentages of the sales price.<sup>96</sup> The latter method is inherently unreliable because it over-

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93. On the use of “explanatory power” as a criterion for selecting among rival theories of complex empirical phenomena (and noting that any theory is incomplete to some extent), see ANOL BHATTACHERJEE, *SOCIAL SCIENCE RESEARCH: PRINCIPLES, METHODS, AND PRACTICES* 28 (2012).

94. See *infra* notes 98–99.

95. See, e.g., Lemley & Shapiro, *supra* note 40 at 2013–16 (discussing how double marginalization “causes prices to be *higher* than would be set by an integrated monopolist who owned all of the patents and sold the downstream product”); Lemley, *supra* note 40, at 152 (stating that a plaintiff asking for 1% of sales of a microprocessor may sometimes be reasonable, but “it may not be reasonable . . . if there are 5000 different inventions bundled together in the microprocessor.”).

96. Ann Armstrong, Joseph J. Mueller & Timothy D. Syrett, *The Smartphone Royalty Stack: Surveying Royalty Demands for the Components Within Modern Smartphones* 2, 69 (Working Paper, 2014), [https://www.wilmerhale.com/-/media/files/shared\\_content/editorial/publications/documents/the-smartphone-royalty-stack-armstrong-mueller-syrett.pdf](https://www.wilmerhale.com/-/media/files/shared_content/editorial/publications/documents/the-smartphone-royalty-stack-armstrong-mueller-syrett.pdf) [<http://perma.cc/CYQ5-EV28>] (relying on data predicting “patent royalties in excess of \$120 on a hypothetical \$400 smartphone — which is almost equal to the cost of device’s components” as “one important reason why selling smartphones is currently a profitable endeavor for only a [few] suppliers”); Lemley & Shapiro, *supra* note 89, at 2025–27 (discussing patents essential to 3G technology and noting that four companies — Qualcomm, Ericsson, Nokia, and Motorola — own three-quarters of these essential patents, which likely contributes to royalties reportedly accounting for 30% of the total price of each phone); Lemley, *supra* note 40, at 152 (noting that, in response to the SSO’s survey of essential patents for 3G wireless protocol, patent owners indicated that there are “6000 ‘essential’ patents” and that “the cumulative royalty rate turned out to be 130%”).



looks the fact that IP licensors and licensees typically engage in negotiations to reduce the announced royalty rate (in some cases, to zero), especially in cases in which the licensee itself has an IP portfolio that can be used for “offsetting” purposes.<sup>97</sup> Empirical researchers that subsequently undertook systematic efforts to collect and analyze royalty data consistently failed to find support for the standard holdup and stacking claims. Using various methodologies, researchers found that estimated average total royalty burdens owing to SEP owners constituted approximately five percent or less of the device price,<sup>98</sup> a result that is consistent with the offsetting practices in licensor-licensee negotiations overlooked by patent holdup theorists. Additionally, researchers found that the royalty-stacking hypothesis is incompatible with the performance of the 3G and 4G wireless markets over an almost two-decade period during which device sales grew dramatically while, adjusted for increased functionality, device prices fell.<sup>99</sup> Other researchers found that entry by device producers has remained robust over the lifetime of the wireless communications device industry.<sup>100</sup>

If the holdup and stacking hypotheses were correct, then it would be expected that device prices would rise, sales would fall over time, and entry by producers would slow — precisely the opposite of what is actually observed. To be clear, this does not reject the proposition that SEP-dependent markets are susceptible to some form of patent holdup and royalty stacking as had been initially theorized. However, our best

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97. For a detailed description of industry cross-licensing practices, see Barnett, *Has the Academy*, *supra* note 24, at 1348–49.

98. Galetovic et al. 2018, *supra* note 88, at 266 (finding estimated aggregate royalty rates of 3.3%); Galetovic et al. 2017, *supra* note 88, at 1532–33 (finding estimated aggregate royalty rates of 3.4%); Sidak, *supra* note 88, at 701–02 (finding estimated aggregate royalty rates of 5%); Mallinson, *supra* note 88, at 1 (finding estimated aggregate royalty rates of 5%).

99. Galetovic & Gupta 2020, *supra* note 88, at 829 (finding estimated aggregate royalty rates of 3–3.5% and finding no other evidence that would suggest widespread royalty stacking).

100. Barnett, *Antitrust Overreach*, *supra* note 47, at 187–89 (concluding that “the wireless device market has consistently exhibited robust entry rates” as demonstrated by “two trends in the smartphone market during 2007–16, each of which is consistent with the view that high patent intensity is consistent with high competitive industry: (i) market leadership has regularly changed hands, and (ii) the portion of the market apparently constituted by smaller firms . . . has steadily increased”); 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, 989 (2016) (“[T]he notable success of several recent market entrants that had virtually no SEPs for the cellular communication standards currently in use demonstrate that royalties charged for use of cellular communications SEPs do not inhibit market entry.”); Kirti Gupta, *Technology Standards and Competition in the Mobile Wireless Industry*, 22 *GEO. MASON L. REV.* 865, 893–94 (2015) (concluding that contrary to fears of royalty stacking, the mobile device market is thriving because “[t]he number of unique firms offering mobile wireless devices has grown steadily from fifteen brands in 2000 to forty-five in 2013 . . . [T]he total of eighty-seven unique manufacturers . . . demonstrates constant entry and exit from the mobile device market . . . almost half (49.3 percent) of the market goes to manufacturers outside of the major five device manufacturers”).

available evidence indicates that this risk does not appear to have been realized yet in any reliably observable form. While this result runs counter to what has become conventional wisdom on SEP policy, it is worthwhile to observe that this is precisely the result that would be anticipated by the original and still-classic formulation of the hold-up problem by Nobel Prize laureate Oliver Williamson. That model both identified circumstances in which holdup risk *could* arise, and described how rational market actors anticipate this risk and take preemptive steps (principally, vertical integration) so that it is unlikely to actually materialize.<sup>101</sup> Given the market's predictive and self-corrective capacities, Williamson therefore presented the holdup theory as a basis *against* policy intervention by antitrust regulators. Patent hold-up theory implicitly treats device manufacturers as lacking the foresight (or, in some versions, having only limited foresight) to anticipate holdup risk and demand protections ahead of time.<sup>102</sup> Once foresight capacities are dropped or constrained by analytical fiat, it then becomes plausible to suppose circumstances in which device manufacturers would make large sunk-cost investments irrespective of holdup risk and IP input suppliers could then freely set the royalty rate and other terms of access. However, this is likely an implausible assumption in business settings involving sophisticated and repeat-play entities that can anticipate such risks and will seek protections ahead of time or, even under milder rationality assumptions, can observe such behavior in the past and will demand protections in connection with future launches of new technologies. As I will show in the next Section, if the standard hold-up model is embedded in a more realistic framework involving sophisticated, repeat-play entities with some reasonable level of memory, learning, and foresight capacities, it yields the expectation that holdup risk is *unlikely* to materialize in real-world SEP-dependent markets — a result that is consistent with observed market performance. This of course reverses the normative conclusion to which patent holdup theory typically leads.

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101. For the classic sources, see generally OLIVER E. WILLIAMSON, *MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS* (1975), and, for a briefer exposition, Oliver E. Williamson, *Transaction-Cost Economics: The Governance of Contractual Relations*, 22 J.L. & Econ. 233 (1979). For closely related arguments, see generally Benjamin Klein, Robert G. Crawford & Armen A. Alchian, *Vertical Integration, Appropriable Rents, and the Competitive Contracting Process*, 21 J.L. & Econ. 297 (1978).

102. In some versions of patent holdup theory, it is acknowledged that technology adopters anticipate holdup risk but asserted that the market lacks effective institutions to eliminate this risk. See, e.g., Shapiro & Lemley, *supra* note 89, at 2042–44 (acknowledging that patent holdup theory requires the lack of protections against holdup, recognizing that market actors have used standard-setting organizations to protect against holdup, but asserting that holdup risk “place[s] considerable weight on the institutions that protect firms from patent holdup”).

## 2. Enriching the Model

In retrospect, the mismatch between academic theory and empirical evidence concerning the smartphone market should not be especially surprising. Given the fact that the broader set of consumer electronics markets have generally exhibited a virtuous combination of increasing functionality, declining prices, and continuous growth over a multi-decade period,<sup>103</sup> it would have been puzzling to discover that IP holders in wireless technology markets were uniquely able to extract exorbitant royalty rates from device producers and other intermediate users. This is especially so given the fact that at least two of these producers — namely, Apple and Samsung — are among the largest companies in the world and enjoy bargaining leverage arising from “bottleneck” positions in the pathway to lucrative consumer markets. Consider the following data point: out of every dollar earned on the sale of an iPhone device, it is estimated that Apple captures approximately 58.5% of total value, which exceeds by a large measure the estimated aggregate royalty rates of approximately five percent earned by IP licensors.<sup>104</sup> This stark discrepancy between theory, which treats IP licensors as unrestrained monopolists, and evidence, which indicates that IP licensors’ royalty rate is substantially constrained by countervailing competitive forces, suggests a rethink of the former is in order.

Any such reexamination exercise is likely to discover that the mismatch between theory and evidence derives in large part from the fact that, as suggested in part above,<sup>105</sup> patent holdup and royalty stacking models rely on a highly simplified model in which important characteristics of real-world SEP licensing environments are omitted.<sup>106</sup> While any theoretical model necessarily makes simplifications for purposes of analytical expediency, it is imperative to keep in mind that any such simplification has the potential to yield factually incorrect expectations

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103. For a review of the evidence, see Jonathan M. Barnett, *From Patent Thickets to Patent Networks: The Legal Infrastructure of the Digital Economy*, 55 JURIMETRICS J. 1, 4–6 (2014) (noting that the “large volume of issued patents, and the associated increase in patent litigation, since the creation of the Federal Circuit in 1982 has [not] resulted in ‘patent thickets’ or ‘anticommons,’” while, “on the ‘supply’ side, private R&D spending in the U.S. computing and electronics industries has grown almost every year for the period 1998–2013; and on the ‘demand’ side, consumers of electronics goods have enjoyed an uninterrupted flow of new products, increasing output and declining prices during that same period” (footnotes omitted)).

104. Kenneth L. Kraemer, Greg Linden & Jason Dedrick, *Capturing Value in Global Networks: Apple’s iPad and iPhone*, 5 fig.1 (2011) (unpublished manuscript) (on file with author); see *supra* notes 98–99.

105. See *supra* note 101 and accompanying text.

106. For more detailed discussion of the issues raised in the remainder of this paragraph, see Barnett, *Has the Academy*, *supra* note 24, at 1356–61.

in a particular case or, of even greater concern, as a systematic matter.<sup>107</sup> Patent holdup theories implicitly assume a one-period payoff-maximization model in which SEP owners each have perfect monopolies and are therefore immune to pricing restraints. This simplification is expedient insofar as it enables the analyst to import well-established models of monopoly pricing, and associated welfare effects, into the IP context. But it may skew the model toward overpredictions of holdup outcomes in real-world markets that do not conform to the model's assumptions. That is because a holdup outcome is far less likely to occur in *multi*-period payoff maximization models in which SEP owners first seek to promote adoption of a new technology and then, once substantial adoption has been achieved, maintain "reasonable" pricing and other access policies that accrue reputational goodwill for purposes of inducing user adoption of new technologies in the future. In a repeat-play environment, a firm that engaged in holdup may earn gains from such behavior in a single period but would incur a net loss given the inability to elicit adoption of its technology in all future periods. This repeat-play model replicates the conventional Williamsonian model of holdup (and, with it, the assumption that repeat-play business entities have memory, learning, and predictive capacities)<sup>108</sup> and is far closer to real-world market conditions. Specifically, this more complex model's prediction that technology holders would seek to accrue reputational goodwill by avoiding holdup matches up nicely with the fact that smartphone markets exhibit an attractive combination of expanding output and declining (quality-adjusted) prices. That in turn most likely explains in part why mobile communications devices have achieved such rapid penetration across a wide range of income segments around the world.<sup>109</sup>

This enriched multi-period revenue-capture model (or equivalently, this reversion to the classic Williamson hold-up model) has the additional virtue that it reflects the fact that innovator-firms in digital communications markets continuously straddle overlapping product lifecycles in which the licensing fees earned from widely adopted "Tech 1.0" are concurrently used to fund R&D for upcoming "Tech 2.0," which will have to battle all over again for market adoption

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107. On the tension between simplicity and completeness in building theoretical models to guide analysis of real-world phenomena, see Michael Weisberg, *Forty Years of 'The Strategy': Levins on Model Building and Idealization*, 21 *BIOLOGY & PHIL.* 623, 625 (2007) (observing that model builders can either build "as much of the target system's complexity into [their] models as [they] possibly can, or [they] choose to make *strategic* idealizations, omitting select aspects of the complexity").

108. See *supra* note 101 and accompanying text.

109. On adoption rates for the smartphone, see Michael DeGusta, *Are Smart Phones Spreading Faster than Any Technology in Human History?*, *MIT TECH. REV.* (May 9, 2012), <https://www.technologyreview.com/2012/05/09/186160/are-smart-phones-spreading-faster-than-any-technology-in-human-history> [<https://perma.cc/8AVQ-P6P4>].

against competing technologies. That is: at the same moment that an innovator-firm is in a position to capture returns on its existing technology in the market, it reinvests some of those funds in R&D efforts designed to develop the next technology generation that will ultimately render obsolete the current generation.<sup>110</sup> In this multi-generational framework that approximates actual market dynamics rather than theoretical models of technology development and monetization in wireless communications device markets, it may be rational for a “one-off” SEP owner to impose large royalties in the case of Tech 1.0, which has already secured market acceptance. However, it is likely irrational to do so if the SEP owner is concurrently investing billions of R&D dollars on maintaining its lead when Tech 2.0 launches. That is: any incremental gain earned by increasing the price for access to a current technology standard must be set off against a potential total loss on the R&D investments being made in anticipation of the subsequent technology standard.<sup>111</sup> This iterative model is a more realistic characterization of the market environment faced by major wireless innovators, who are continuously making R&D investments in order to outmatch well-resourced and technically sophisticated competitors by maximizing long-term revenues over the partially overlapping lifecycles of 3G, 4G, and now 5G technologies. In retrospect, students of antitrust history may conclude that the intensive regulatory scrutiny of licensing practices in the smartphone market misallocated scarce enforcement resources to a market that exhibited strong self-corrective capacities and therefore little risk of anticompetitive harm.

### III. THE SUPREME COURT: THE OVERLOOKED POWER OF THE CREEPING DISSENT

In most cases, a dissent in a judicial opinion is of little consequence, for the self-evident reason that it represents the view of the minority. Yet a dissent occasionally becomes a “sleeper hit” over time as its views enter the mainstream of judicial thinking, ultimately being adopted as the basis for subsequent decisions by the same or other

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110. For a detailed description of this iterative process, see Kirti Gupta, *How SSOs Work: Unpacking the Mobile Industry's 3GPP Standards*, in *THE CAMBRIDGE HANDBOOK OF TECHNICAL STANDARDIZATION LAW* 29, 43 (Jorge L. Contreras ed., 2017); Kirti Gupta, *Technology Standards and Competition in the Mobile Wireless Industry*, 22 *GEO. MASON L. REV.* 865, 869–71 (2015).

111. As I have argued elsewhere, the prospect of ex post penalties for ex ante opportunism can exert a potent disciplining effect on the pricing and other behavior of even apparently dominant platforms (up to and including zero-priced giveaways of a platform's most valuable intellectual assets). See Jonathan M. Barnett, *The Host's Dilemma: Strategic Forfeiture in Platform Markets*, 124 *HARV. L. REV.* 1861, 1864–66 (2010) (observing that dominant platforms often provide access to valuable intellectual assets at a zero price and arguing that this is an economically rational strategy to secure adoption by credibly committing against future holdup behavior).

courts. A famous example in IP jurisprudence is Justice Brandeis’s dissent to the Supreme Court’s 1918 decision in *International News Service v. Associated Press*,<sup>112</sup> which has grown in influence over time while the majority opinion (which recognized the now-dormant “hot news” tort of misappropriation) has lapsed into obscurity. In this Part, I explore the admittedly speculative but nonetheless arguable possibility that a similarly upward trajectory may be enjoyed by the under-discussed dissent authored by Justice Gorsuch (and joined by Chief Justice Roberts) in *Oil States Energy Services, LLC v. Greene’s Energy Group, LLC*,<sup>113</sup> a 2018 decision in which the majority apparently delivered a strong rejection of property-rights approaches to enforcing patents.

#### A. Oil States: *Two Decisions in One?*

At least as a matter of intellectual symbolism, the *Oil States* decision delivered a ringing endorsement for patent-skeptical commentators and advocates by enshrining in Supreme Court case law an administrative vision of intellectual property law. A 7-2 majority rejected the proposition that patents are private property rights, stating that patents are “public franchises”<sup>114</sup> and the grant of a patent is a “matte[r] involving public rights.”<sup>115</sup> Strictly speaking, the Court emphasized the “narrowness” of its holding<sup>116</sup> and expressed this view — that is, the characterization of a patent as a public right — solely in connection with the specific question of whether a patentee is always entitled to an Article III federal court proceeding concerning a challenge to a patent’s validity, rather than the administrative *inter partes* review (“IPR”) proceeding provided by the AIA.<sup>117</sup> The IPR mechanism enables any party to challenge the validity of an issued patent on grounds of novelty or obviousness under sections 102 or 103, respectively, of the Patent Act, starting nine months after issuance of the patent.<sup>118</sup> Holding that patents are “public” rather than “private” rights, the Court could then rely on existing precedent that public rights may

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112. 248 U.S. 215, 248 (1918).

113. 138 S. Ct. 1365, 1380 (2018) (Gorsuch, J., dissenting).

114. *Id.* at 1368 (quoting *Seymour v. Osborne*, 78 U.S. (11 Wall.) 516, 533 (1870)).

115. *Id.* at 1373 (quoting *Murray’s Lessee v. Hoboken Land & Improvement Co.*, 59 U.S. (18 How.) 272, 284 (1856)).

116. *Id.* at 1379.

117. The argument relies on Article III of the U.S. Constitution, which provides that “[t]he judicial power of the United States, shall be vested in one Supreme Court, and in such inferior courts as the Congress may from time to time ordain and establish,” U.S. CONST. art. III, § 1.

118. 35 U.S.C. § 311(b) (2011) (providing that a challenger “may request to cancel as unpatentable 1 or more claims of [the] patent” on grounds of obviousness or lack of novelty).

be adjudicated in non-Article III proceedings, such as the PTAB tribunal administered by the USPTO.<sup>119</sup> To be clear, the Court acknowledged that the patent statute provides that patents have “the attributes of personal property” (subject to other applicable provisions of the statute<sup>120</sup>), and stated that its ruling did not foreclose more targeted challenges under the Due Process Clause or Takings Clause to administrative procedures to revoke patents.<sup>121</sup>

Justice Gorsuch and Chief Justice Roberts issued a dissent that may be a bellwether of an incremental moderation in the Court’s usually unanimous or near-unanimous patent-skeptical decisions since approximately the mid-2000s.<sup>122</sup> The dissenting Justices identified a tension between, on the one hand, the PTAB’s ability to revoke erroneously issued patents within a framework characterized by broad administrative discretion and, on the other hand, a meaningful commitment to patent rights that can only be revoked by independent judges, as contemplated (according to the dissent) by the U.S. Constitution and legal practice and understanding at the time of the Constitution’s ratification. Specifically, the dissent took the view that the Constitution’s “Patent Clause”<sup>123</sup> embodied an understanding of patents as private property rights that reflect inventive merit, as distinguished from the view of patents as state-granted privileges that had sometimes characterized the operation of the patent system in contemporary English practice.<sup>124</sup> Among other elements of the PTAB mechanism, the dissent

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119. *Oil States*, 138 S. Ct. at 1373 (stating that a patent “has the key features to fall within this Court’s long-standing formulation of the public-rights doctrine”).

120. The Patent Act provides that “[s]ubject to the provisions of this title, patents shall have the attributes of personal property,” 35 U.S.C. § 261 (2011).

121. *Oil States*, 138 S. Ct. at 1379 (clarifying that its decision “should not be misconstrued as suggesting that patents are not property for purposes of the Due Process or Takings Clause . . . . The Seventh Amendment preserves the ‘right of trial by jury’ . . . . [But] when Congress properly assigns a matter to adjudication in a non-Article III tribunal, ‘the Seventh Amendment poses no independent bar to the adjudication of that action by a nonjury factfinder,’” and explaining that, “rejection of *Oil States*’ Article III challenge also resolves its Seventh Amendment challenge . . . . [I]nter partes review is a matter that Congress can properly assign to the PTO, [so] a jury is not necessary”) (citations omitted).

122. For a review of those decisions through 2016, see Barnett, *Quasi-Fallacies*, *supra* note 10, at 44. For a discussion of post-2016 Supreme Court patent-related cases through 2018, see Jonathan M. Barnett, *The Patent System at a Crossroads*, 41 REGULATION 1, 44 (Spring 2018).

123. Specifically, the Clause provides: “The Congress shall have the power . . . To promote the progress of science . . . by securing for limited times to Authors and Inventors the exclusive right to their respective writings and discoveries,” U.S. CONST., art. 1, § 8, cl. 8.

124. 138 S. Ct. at 1382–83 (Gorsuch, J., dissenting) (arguing that “[the Patent] Clause sought to *reject* some of early English practice . . . [and that] the framers wrote the Clause to protect only procompetitive invention patents that are the product of hard work and insight and ‘add to the sum of useful knowledge’” (citation omitted) (quoting *Graham v. John Deere & Co. of Kansas City*, 383 U.S. 1, 6 (1966)), and discussing original intention to distinguish invention patents from “anticompetitive monopolies” granted to favored constituencies). For extensive historical evidence supporting this distinction between the merit-based practices that tended to characterize the U.S. patent system and the rent-seeking practices that tended

expressed concern about the USPTO Director's ability to determine the composition of PTAB panels that adjudicate challenges to patent validity.<sup>125</sup> This power posed the possibility that a Director could have outcome-driven incentives to influence the composition of a panel, a risk that seemed to be more than theoretical in light of the fact that, as the dissenting Justices observed, the "Director ha[d] [not] proven bashful about asserting these statutory powers to secure the 'policy judgments' he seeks."<sup>126</sup>

While the *Oil States* dissent obviously did not sway other members of the Court, it does indicate at a minimum that there are at least two Justices who may not be reflexively partial to the IP-skeptical consensus that has dominated the Court's patent jurisprudence since at least its 2006 decision in *eBay, Inc. v. MercExchange, LLC*.<sup>127</sup> As I describe below, both majority and minority opinions in other Supreme Court decisions issued shortly before and after *Oil States* indicate that there are at least *six* Justices who appear to have concerns about the scope of adjudicative authority that Congress delegated to the PTAB and the extent to which that authority is being applied, or could be applied, in a manner that is inconsistent with due process principles.

### B. *The Oil States Boomerang Effect*

The seemingly far-fetched possibility of a patentee-friendly effect arising in connection with the decidedly patentee-unfriendly *Oil States* decision is not merely provocative speculation. Both prior to and following *Oil States*, the Court granted certiorari in six cases (one still pending) relating to the mechanics of the PTAB, which reflects an interest in scrutinizing closely the PTAB's exercise of its powers under

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to characterize British and French patent systems, see generally B. ZORINA KHAN, *THE DEMOCRATIZATION OF INNOVATION: PATENTS AND COPYRIGHTS IN AMERICAN ECONOMIC DEVELOPMENT 1790–1920* (2005).

125. 138 S. Ct. at 1381 (Gorsuch, J., dissenting) (noting that the Director of the Patent Office, politically appointed by the President, "supervises and pays the Board members responsible for deciding patent disputes . . . selects which of these members, and how many of them, will hear any particular patent challenge . . . [and] [i]f they (somehow) reach a result he does not like, the Director can add more members to the panel — including himself — and order the case reheard") (citations omitted).

126. *Id.* On alleged "panel stacking" undertaken by the USPTO Director and the Chief Justice of the PTAB in order to reverse PTAB judgments, see John M. Golden, *PTO Panel Stacking: Unblessed by the Federal Circuit and Likely Unlawful*, 104 IOWA L. REV. 2447, 2449 (2019).

127. 547 U.S. 388 (2006). The inclusion of Chief Justice Roberts in this emergent constituency is not unexpected. Together with the late Justice Ginsburg, Justice Roberts had authored a concurring opinion in the *eBay* decision counseling the lower courts to remain mindful of the long-standing historical practice to grant patentees injunctive relief after a successful defense of validity and showing of infringement. See *id.* at 395 (Roberts, C.J., concurring) (observing the "long tradition of equity practice" granting "injunctive relief upon a finding of infringement in the vast majority of patent cases") (quoting *Weinberger v. Romero-Barcelo*, 456 U.S. 305, 320 (1982)).



the AIA, and, in its substantive rulings in these cases, has generally construed those powers narrowly. As discussed below, there appears to be a growing constituency in the Court that is concerned about the due process issues raised by the PTAB mechanism and related fairness implications for patent owners. For ease of reference, the decisions discussed below, and the Justices who joined opinions or argued for the invalidity of certain features of the PTAB, are listed in Table 2. Note that the Table does not include the pending case involving the PTAB that the Court will likely decide later in 2021.<sup>128</sup>

Table 2: PTAB-Related Supreme Court Decisions (2016–2020)

Year	Decision	Contested PTAB Action Overturned?	Justices Opposing Contested PTAB Action <sup>129</sup>
2016	<i>Cuozzo Speed Technologies, LLC v. Lee</i>	N (8-0, 6-2)	Alito and Sotomayor concur and dissent in part. <sup>130</sup>
2018	<i>Oil States Energy Services, LLC v. Greene's Energy Group, Inc.</i>	N (7-2)	Gorsuch, Roberts
2018	<i>SAS Institute Inc. v. Iancu</i>	Y (5-4)	Gorsuch, Alito, Kennedy, Roberts, Thomas
2019	<i>Return Mail, Inc. v. United States Postal Service</i>	Y (6-3)	Sotomayor, Alito, Gorsuch, Kavanaugh, Roberts, Thomas
2020	<i>Thryv, Inc. v. Click-To-Call Technologies, LP</i>	N (7-2)	Gorsuch, Sotomayor

#### 1. *SAS Institute, Inc. v. Iancu*

In *SAS Institute Inc. v. Iancu*, a decision issued concurrently with *Oil States*, Justice Gorsuch took the first step in cabining the PTAB's adjudicative discretion. In a closely decided 5-4 opinion, the Court held that the PTAB, when electing to "institute" a petitioner's challenge to

128. *Arthrex, Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320, 1327–28 (Fed. Cir. 2019), cert. granted, 141 S. Ct. 551 (2020). The case addresses the question as to whether administrative patent judges on the PTAB are "principal officers" for purposes of the Constitution's Appointments Clause, in which case they would have to be appointed by the President and confirmed by the Senate. *Id.* Currently administrative patent judges are appointed by the Secretary of Commerce. *Id.*

129. The last name of the Justice who wrote the opinion (majority or dissenting, as relevant) is listed first. All other Justices who joined in the opinion are listed in alphabetical order.

130. Note that Justice Gorsuch was not on the Court at the time of this decision.

a patent,<sup>131</sup> must either institute all or none of the challenged claims, rather than cherry-picking some of the challenged claims.<sup>132</sup> Determining whether to “institute” a challenge in the PTAB administrative process, which is a precondition to adjudicating the patent challenge,<sup>133</sup> may be analogized to determining whether a cause of action survives summary dismissal in civil litigation. Relying on the literal statutory language (as well as a comparison of the construction of the *inter partes* mechanism in the AIA as compared to the previously existing *ex parte* reexamination mechanism<sup>134</sup>), the majority concluded that, if a challenge survives institution, then Congress intended for the PTAB to adjudicate all of the challenged claims.<sup>135</sup> While the majority opinion does not rely on a policy argument (other than rejecting as immaterial the USPTO’s policy argument on grounds of operational efficiency<sup>136</sup>), the substantive impact of the *SAS Institute* decision is in line with Justice Gorsuch’s concerns, as expressed concurrently in his *Oil States* dissent, that administrative discretion cannot run roughshod over what he views as the Constitution’s underlying commitment to meaningful patent rights for inventors.

2. *Cuozzo Speed Technologies, LLC v. Lee; Return Mail, Inc. v. United States Postal Service*

Critically, Justice Gorsuch is not the only member of the Court who has expressed these concerns. In 2016, Justices Alito and Sotomayor (who partially concurred in, and dissented from, the majority opinion) raised related concerns in objecting to the part of the majority’s opinion in *Cuozzo Speed Technologies, LLC v. Lee*,<sup>137</sup> in which the Court had upheld a provision in the AIA that immunized from judicial review the

131. Technically, the statute provides that the Director makes the institution decision, see 35 U.S.C. § 314(b) (2012) (“The Director shall determine when to institute an inter partes review.”). However, USPTO regulations provide that the PTAB panel may make this determination, see 37 C.F.R. § 42.4(a) (2017) (providing that “[t]he Board institutes the trial on behalf of the Director”).

132. *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348, 1352–53 (2018).

133. For the statutory basis of the institution proceeding, see 35 U.S.C. § 311(a) (2018) (providing that a party must file “a petition to institute an inter partes review of [a] patent”).

134. *SAS Institute*, 138 S. Ct. at 1355 (noting that, in the *ex parte* reexamination mechanism, the statute had authorized the USPTO Director to determine patentability “[o]n his own initiative, and at any time” (quoting 35 U.S.C. § 303(a))).

135. *Id.* at 1354 (relying on statutory language providing that “[i]f an inter partes review is instituted and not dismissed under this chapter, the [Board] shall issue a final written decision with respect to the patentability of any patent claim challenged by the petitioner” (quoting 35 U.S.C. § 318(a)) and concluding that “the Board must address every claim the petitioner has challenged”).

136. *Id.* at 1357–58 (rejecting USPTO’s argument that the Court should allow for “partial institution” because it would be more efficient and stating that “[p]olicy arguments are properly addressed to Congress, not this Court”).

137. 136 S. Ct. 2131, 2148–49 (2016) (Alito, J. and Sotomayor, J., concurring and dissenting in part).

PTAB's decision whether or not to institute an IPR petition. Moreover, even while the majority in *Cuozzo* upheld the plain language of the AIA's "final and nonappealable" provision, it qualified that ruling by stating: "[W]e do not categorically preclude review of a final [PTAB institution] decision where a petition fails to give 'sufficient notice' such that there is a due process problem with the entire proceeding."<sup>138</sup> Reflecting this emergent concern over the AIA's expansive delegation of adjudicative powers to the PTAB, a 6-3 majority ruled in *Return Mail, Inc. v. United States Postal Service*, a case decided in June 2019, that a federal agency lacked standing to challenge a patent under AIA administrative proceedings.<sup>139</sup> While this decision largely turned on a run-of-the-mill question of statutory construction<sup>140</sup> (much like *SAS v. Iancu*), it suggests more generally that a majority of the Court may now be inclined toward a narrow reading of the adjudicative powers delegated to the PTAB in the AIA.

### 3. *Thryv, Inc. v. Click-To-Call Technologies, LP*

The Court's most recent PTAB-related ruling, *Thryv, Inc. v. Click-To-Call Technologies, LP*,<sup>141</sup> decided in 2020, might seem to point in the opposite direction insofar as the decision upheld the non-appealability of the PTAB's determination as to whether an IPR petition is filed on a timely basis. Yet, it is suggestive that Gorsuch, one of the two dissenting Justices in *Oil States*, also dissented to this opinion. In the dissent to *Thryv, Inc.*,<sup>142</sup> Justice Gorsuch bemoaned the "wrong turn" the Court took in *Oil States*, again rejecting the view that patents are "merely another public franchise that can be withdrawn more or less by executive grace"<sup>143</sup> and going on to argue that, following the Court's administrative view, "[a]n issued patent becomes nothing more than a transfer slip from one agency window to another."<sup>144</sup> This type of vigorous defense of the patent system has not appeared in recent memory in the Court's patent jurisprudence, even in dissenting opinions, and

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138. *Id.* at 2141.

139. *Return Mail, Inc. v. U.S. Postal Serv.*, 139 S. Ct. 1853, 1861–63 (2019) (holding that "[t]he Government is not a 'person' authorized to initiate [AIA post-issuance review proceedings] absent an affirmative showing to the contrary" in response to the U.S. Postal Service's petition for covered-business-method review against Return Mail, Inc.'s patent for processing undeliverable mail).

140. Specifically, the case concerned whether the government qualified as a "person" for purposes of the AIA's patent challenge mechanisms, which in turn determined whether or not a government agency (such as the Postal Service) had standing to challenge a patent through these mechanisms. *See id.*

141. 140 S. Ct. 1367, 1367 (2020).

142. *Id.* at 1378–89 (Gorsuch, J., dissenting). Justice Sotomayor also dissented to *Thryv, Inc.*; however, she did not join the portion of the opinion referenced above.

143. *Id.* at 1387.

144. *Id.* at 1388.

constitutes a meaningful, albeit small, crack in the Court's patent-skeptical consensus.

#### 4. Future Implications

It may seem unrealistic to expect that a majority of the Supreme Court Justices would shift to a more patent-sympathetic trajectory in the immediate future. Yet there is in fact some reason to believe this might occur specifically in the case of patent-related questions that raise procedural fairness implications in the context of the PTAB or potentially other features of the patent system. Since 2016, six members of the Court have supported at least one majority or dissenting opinion that limits the powers of the PTAB, even though there are few other indications of a retreat from the Court's generally skeptical approach on other patent law issues.<sup>145</sup> Even if the shift in the Supreme Court's patent jurisprudence ultimately only impacts the operation of the PTAB, this would still be practically significant because such a large percentage of district court infringement litigation is now accompanied by a PTAB validity challenge.<sup>146</sup> Given that district courts regularly stay litigations pending PTAB determinations,<sup>147</sup> the PTAB now effectively acts as the initial gatekeeper that determines whether a material percentage of infringement litigations can proceed (subject to uncertainties in some cases concerning the estoppel effect of PTAB determinations<sup>148</sup>). While *Oil States* may be most closely associated with what

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145. It could be argued that the PTAB-specific focus of these decisions may only reflect concerns by some members of the Court concerning the scope of administrative action in general, rather than concerns that are specific to patents in particular. This argument would not appear to be plausible in the case of Justice Gorsuch, who, as described above, specifically articulated in *Oil States Energy Services, LLC v. Greene's Energy Group, LLC*, 138 S. Ct. 1365, 1380–86 (2018) (Gorsuch, J., dissenting), a property-rights view of the patent system, and may have limited plausibility in the case of Justice Roberts, who (together with the late Justice Ginsburg) had authored an opinion in *eBay, Inc. v. MercExchange, LLC*, 547 U.S. 388, 395 (2006) (Roberts, C.J., concurring) that emphasized the historical practice of granting injunctions in almost all cases in which a patentee successfully defends validity and demonstrates infringement. In the case of other Justices, some mix of general and patent-specific concerns may have motivated their decision to join at least one of the patentee-friendly opinions described above.

146. As of 2016, approximately one-third of all patent infringement litigations in federal district court were associated with a concurrent PTAB proceeding. See ASS'N CORP. COUNS., *LIVING IN A POST-AIA, POST-ALICE WORLD* 30 (2016).

147. On stay rates in federal patent infringement litigation, see Graham C. Phero & Lauren A. Watt, *Success of Motions to Stay Rising, But Why?*, STRERNE, KESSLER, GOLDSTEIN & FOX (Feb. 2020), <https://www.sterneessler.com/news-insights/publications/success-motions-stay-rising-why> [<https://perma.cc/2XEL-DQYW>], which reports that, in 2019, motions to stay infringement proceedings pending a PTAB determination were granted at 70%, 73%, and 89% rates in the district courts of Delaware, Eastern District of Texas, and Northern District of California, respectively.

148. While the AIA estops an IPR petitioner from bringing duplicative validity challenges against a patent in federal district court, see 35 U.S.C. § 315(e)(2) (2018), this is limited to claims that were "raised or reasonably could have been raised" in the IPR proceeding, which

may ultimately be a largely conceptual holding that patents are “public rights,” the majority opinion’s more mundane “reservation of rights” may turn out to be more consequential. That qualifying language opens the door to challenges to specific elements of the PTAB on due process and related grounds and, as such, may presage a rebalancing of patent owners’ rights in the PTAB context (which, in turn, may have an indirect effect on patent owners’ likelihood of success in district court litigation).

These process-based challenges can have significant consequences. A currently pending and widely discussed case at the Court (which granted *certiorari* in October 2020 and heard oral argument in March 2021), *Arthrex, Inc. v. Smith & Nephew, Inc.*,<sup>149</sup> addresses whether PTAB judges are “principal officers” for purposes of the Constitution’s Appointments Clause.<sup>150</sup> If the answer is affirmative, the consequences could be significant. In the most extreme case, all present PTAB judges would have to step down and all future judges would have to be appointed by the President and confirmed by the Senate, a result that would seem to cast doubt on the future viability of the PTAB in its current form. In a substantially less extreme remedy adopted by the Federal Circuit, all present PTAB judges could be converted to “inferior” officers by eliminating the judges’ statutory protections against removal at the discretion of the USPTO Director.<sup>151</sup> Pending a decision by the Court on this question, the Federal Circuit may vacate up to eighty-one PTAB decisions (in which an Appointments Clause challenge had been raised) and remand them to be heard by newly constituted PTAB panels.<sup>152</sup> A prominent law firm has observed: “For those who thought the constitutionality of proceedings before the PTAB had

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has in turn given rise to uncertainty and litigation concerning the scope of this estoppel provision. For a concise and updated analysis of this issue, see Pauline M. Pelletier & Rebecca A. Lindhorst, *IPR Estoppel Questions Answered and Remaining*, STRERNE, KESSLER, GOLDSTEIN & FOX (Feb. 2020), <https://www.sterneessler.com/news-insights/publications/ipr-estoppel-questions-answered-and-remaining> [<https://perma.cc/4HZZ-KFUG>].

149. 941 F.3d 1320, 1327–28 (Fed. Cir. 2019), *cert. granted*, 141 S. Ct. 551 (2020). See Amy Howe, *Supreme Court Will Consider Constitutional Status of Administrative Patent Judges*, SCOTUSBLOG (Oct. 13, 2020), <https://www.scotusblog.com/2020/10/supreme-court-will-consider-constitutional-status-of-administrative-patent-judges/> [<https://perma.cc/SVB8-7J9N>].

150. U.S. CONST. art. II, § 2, cl. 2.

151. *Arthrex*, 941 F.3d at 1321 (agreeing that the PTAB judges are “principal” officers under the statute’s current form, severing the portion of the statute that provides PTAB judges with protections against removal, and concluding that this remedy renders the judges “inferior” officers subject to removal at the discretion of the USPTO Director).

152. See *Arthrex, Inc. v. Smith & Nephew, Inc.*, 953 F.3d 760, 764 (Fed. Cir. 2020) (Moore, J., concurring in the denial of rehearing en banc).

been resolved in the 2018 Supreme Court case *Oil States Energy Services LLC v. Greene's Energy Group LLC* . . . it now appears to have just been the beginning.”<sup>153</sup>

#### IV. USPTO: AVOIDING “OVERSHOOTING” ON PATENT QUALITY

It has long been assumed in scholarly and popular commentary that the establishment of the Federal Circuit, and the ensuing development of a body of patentee-friendly case law, raised the bar for challenging the validity of issued patents and, as a consequence, resulted in a socially unproductive accumulation of low-value patents, which in turn provided a fertile base for nuisance licensing demands and infringement litigation.<sup>154</sup> Undoubtedly, patents for “Method for Swinging on a Swing”<sup>155</sup> or “Sealed Crustless Sandwich”<sup>156</sup> (two commonly cited examples of “junk patents”) should not have been issued and, in any event, both expired prior to full term due to lack of payment of renewal fees,<sup>157</sup> indicating a lack of commercial value. The key empirical question, however, is whether these self-evidently “bad” patents are representative of the much larger pool of patents being issued in general. The dominant school of thought in patent policy commentary has *assumed* that the answer to this question is clearly affirmative. Yet, as I show below, more systematic empirical study has shown that assessing the distribution of patent quality is a complex empirical challenge and, at a minimum, previously and widely shared estimates of near-100% USPTO approval rates were flatly wrong. The same process of empirical scrutiny that elicited a policy shift that has incrementally increased protections for SEPs has led to a policy shift that has incrementally

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153. Douglas R. Nemeck & Cassandra A. Baloga, *In Arthrex, Supreme Court To Review Constitutionality of Patent Board's Structure*, SKADDEN, ARPS, SLATE, MEAGHER & FLOM LLP (Dec. 22, 2020), <https://www.skadden.com/insights/publications/2020/12/insights-special-edition-us-supreme-court-term/in-arthrex-scotus-to-review> [<https://perma.cc/S468-PX3F>].

154. *See, e.g.*, NAT'L RSCH. COUNCIL, A PATENT SYSTEM FOR THE 21ST CENTURY 51 (Stephen A. Merrill et al. eds., 2004) (“There are several reasons to suspect that more issued patents are deviating from previous or at least desirable standards of utility, novelty, and especially non-obviousness.”); JAFFE & LERNER, *supra* note 1, at 32–35 (arguing that the USPTO often grants patent applications without evidence of inventive contribution due to insufficient investment in examination quality by the USPTO). For a popular contribution to the same effect, see *Junk Patents*, FORBES (June 15, 1997, 11:00 PM) <https://www.forbes.com/forbes/1997/0616/5912124a.html#328391741d27>

[<https://perma.cc/QFB2-3N3L>] (stating that the USPTO often issues patents for inventions that cannot be practically implemented and then give rise to costly litigation).

155. Method of Swinging on a Swing, U.S. Patent No. 6,368,227 (issued Apr. 9, 2002).

156. Sealed Crustless Sandwich, U.S. Patent No. 6,004,596 (issued Dec. 21, 1999).

157. '227 Patent, <https://patents.google.com/patent/US6368227B1/en>,

[<https://perma.cc/72DU-S76T>]; '596 Patent,

<https://patents.google.com/patent/US6004596A/en> [<https://perma.cc/SXP2-FMJF>].

heightened the barriers faced by petitioners who challenge issued patents through the PTAB.

*A. Knowing What We Don't Know About "Junk Patents"*

The AIA established or modified three administrative proceedings, the covered business method proceeding, post-grant review, and *inter partes* review ("IPR"), which provide opportunities to challenge the validity of issued patents at the USPTO.<sup>158</sup> The IPR mechanism is by far the most popular of the three patent challenge mechanisms, representing 93% of all PTAB petitions filed from September 2012 to March 2020.<sup>159</sup> All three patent challenge mechanisms reflect the widely-held view (as noted above<sup>160</sup>) that the increase in patent issuance starting in the 1980s had reflected in part lax examination standards at the USPTO, resulting in the issuance of low-value patents that impose unnecessary litigation and other costs. Yet it is hard to know whether individual cases of wrongly issued patents are simply the inevitable aberrant errors that would arise in any otherwise well-functioning system, or rather whether they indicate a systematic decline in patent quality that characterizes significant portions of the total pool of issued patents. A closer look at both economic theory and empirical evidence — much of which has not been sufficiently integrated into policy commentary on this topic — shows that this is a more complex and unsettled question than is often assumed.

In particular, it remains unsettled whether examination standards at the USPTO were in fact significantly relaxed starting in the 1980s compared to previous examination standards at the USPTO, examination standards at other major patent offices, or an indeterminate socially efficient standard of examination quality. Much of the literature has sought to measure patent quality by calculating grant rates (also known as "allowance rates") at different patent offices, or the same patent office over time, where the grant rate can be defined most simply as (i) the number of patents issued divided by (ii) the number of patent applications (excluding applications abandoned by the applicant).<sup>161</sup> Based on

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158. For the statutory sources of these mechanisms, see Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 18, 125 Stat. 284 (2011) (covered business method patent review); 35 U.S.C. §§ 311–319 (*inter partes* review); and 35 U.S.C. §§ 321–329 (post-grant review). Note that the covered business method mechanism lapsed as of September 16, 2020. Leahy-Smith America Invents Act § 18(a)(3)(A).

159. U.S. PAT. & TRADEMARK OFF., TRIAL STATISTICS IPR, PGR, CBM, PATENT TRIAL AND APPEAL BOARD 3 (Mar. 31, 2020), [https://www.uspto.gov/sites/default/files/documents/trial\\_statistics\\_20200331.pdf](https://www.uspto.gov/sites/default/files/documents/trial_statistics_20200331.pdf) [<https://perma.cc/PQ96-6N4V>] [hereinafter USPTO, Trial Statistics].

160. See *supra* note 154 and accompanying text.

161. This is a simplification. For reasons discussed subsequently, the grant rate, at least in the USPTO context, is sensitive to the definition of the denominator insofar as applicants have the opportunity to file "continuation" applications based on a single "parent" application. To

widespread anecdotal reports, apparently corroborated by a study published in 2001 that purported to find grant rates as high as 97%<sup>162</sup> (later corrected in 2002 by the authors of the same study to 85%<sup>163</sup>), commentary in the academy, industry, and policy circles had widely asserted that the post-1982 USPTO operated as a “rubber stamp” that approved almost all patent applications<sup>164</sup> or at least approved patent applications at a rate significantly higher than other leading patent offices.<sup>165</sup> At least two subsequent papers, published in 2003 and 2008, respectively, discredited the 2001 contribution, finding calculation errors and other deficiencies that led to the implausible 97% grant rate.<sup>166</sup> Curiously, the rebuttal 2003 and 2008 papers have only been cited 35 and 25 times, respectively, whereas each of the 2001 and 2002 papers (the first of which includes the discredited 97% estimate) have been cited, respectively, 221 and 114 times.<sup>167</sup> Put differently: the scholarly literature cites an admittedly incorrect paper on the same topic (the 2001 paper) almost *nine times* more than a subsequent paper (the 2008 paper) that corrects it. It so happens that the more highly cited paper conforms to the prevailing “junk patents” narrative while the other paper challenges it. This generalized form of confirmation bias bears a striking resemblance to the fact that scholarly and policy commentary on SEP licensing continues to assert that patent holdup is a material risk

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avoid overestimating the grant rate (since the continuation process can give rise to multiple patents), it is therefore necessary to develop a methodology to pair each issued patent with a unique patent application. For further discussion of this point, see *infra* note 170.

162. Cecil D. Quillen & Ogden H. Webster, *Continuing Patent Applications and Performance of the U.S. Patent & Trademark Office*, 11 FED. CIR. BAR J. 1, 13 (2001) (finding allowance rate of up to 97% during 1993–98).

163. Cecil D. Quillen, Ogden H. Webster & Richard Eichmann, *Continuing Patent Applications and Performance of the U.S. Patent & Trademark Office — Extended*, 12 FED. CIR. BAR J. 35, 38, 50 (2002) (extending the earlier study through 2000, making corrections, and finding grant rates of approximately 85%). The authors subsequently published updated studies. See Cecil D. Quillen & Ogden H. Webster, *Continuing Patent Applications and the U.S. Patent & Trademark Office — Updated*, 15 FED. CIR. BAR J. 635, 642–43, 660–61 (2006) (updating the earlier studies through 2005, making further corrections, and finding grant rates of approximately 85% for the 2002 study and 80–87% from 1986–2005); Cecil D. Quillen & Ogden H. Webster, *Continuing Patent Applications and the U.S. Patent & Trademark Office — One More Time*, 18 FED. CIR. BAR J. 379, 396–98 (2009) (updating the earlier studies through 2008).

164. See, e.g., JAFFE & LERNER, *supra* note 1, at 34–35 (stating that the USPTO suffers from personnel shortages and skewed incentives such that the screening tests for novelty and non-obviousness “that are supposed to ensure that the patent monopoly is granted only to true inventors have become largely non-operative”).

165. See, e.g., NAT’L RSCH. COUNCIL, *supra* note 7, at 54 (referring to claims that the USPTO has exhibited increasingly higher grant rates “relative to comparable rates in other industrialized countries”).

166. Robert A. Clarke, *U.S. Continuity Law and its Impact on the Comparative Patenting Rates of the US, Japan and the European Patent Office*, 85 J. PAT. & TRADEMARK OFF. SOC’Y 335, 336–43 (2003); Ron D. Katznelson, *Bad Science in Search of Bad Patents*, 17 FED. CIR. BAR J. 1, 14 (2008).

167. All citation information is based on Google Scholar, as of January 4, 2021.



even after systematic empirical inquiries have repeatedly failed to find support for that claim.<sup>168</sup>

Since these early attempts to systematically investigate evidence relevant to the “junk patents” claim, the empirical literature on the topic has grown.<sup>169</sup> While results and methodologies vary, all empirical studies have found significantly lower (and roughly comparable) average grant rates compared to the “rubber stamp” findings in the two pioneer studies, although there remain methodological obstacles (due to certain unique features of the U.S. patent system associated especially with continuation applications<sup>170</sup>) that require qualifying any individual study’s findings to a certain extent. The aforementioned 2008 study found that grant rates fell within a range of 60% to 76%,<sup>171</sup> which is close to the average grant rate of approximately 74% determined by the aforementioned 2003 study<sup>172</sup> (both of which had rebutted the 2001 and 2002 studies that had provided support for the “rubber stamp” thesis). A widely-cited study published in 2008 reported that “the PTO rejects a *surprisingly* high percentage of patent applications” (my emphasis inserted to indicate the influence of the dominant “junk patents” narrative), finding that “approximately 75% of all applications result in at least one patent,” with higher grant rates in the pharmaceutical and chemical industries than the software and computer fields.<sup>173</sup> For the period of 1996 to 2013, a subsequent empirical study even found that grant rates had declined,<sup>174</sup> which is obviously inconsistent with the

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168. On the failure to integrate empirical findings on SEP licensing into “mainstream” policy commentary, see *supra* note 89 and accompanying text; on the empirical evidence concerning SEP licensing, see *supra* notes 98–100 and accompanying text.

169. Note that the discussion in this paragraph is intended as a representative, not a comprehensive, discussion of all relevant studies.

170. For a helpful discussion of these complex technical issues, see Michael Carley, Deepak Hegde & Alan Marco, *What is the Probability of Receiving a U.S. Patent?*, 17 YALE J.L. & TECH. 203, 204–12 (2014) (finding an allowance rate of 55.8% among non-continuation applications and 71.2% among non-continuation and continuation applications, and identifying the obstacles in calculating patent allowance rates, including the fact that many applicants alter their claims during examination resulting in the allowance of certain patentable claims rather than the allowance of the initial application as filed). As Katznelson explains, *supra* note 166, at 8–12, the ability of patent applicants at the USPTO to file continuation applications means that a single “parent” application (which is maintained to establish the earliest possible priority date) can have multiple “descendant” applications, which may then mature into multiple patents. If a researcher does not take this practice into account (and specifically does not distinguish between continuation applications that “recycle” previous applications and those that represent new applications), then an artificially elevated grant rate is almost certain to be generated. *See id.* at 13–14. Additionally, the continuation option makes it challenging to compare grant rates at the USPTO with grant rates at other patent offices where there is no comparable procedure. *Id.* at 24.

171. Katznelson, *supra* note 166, at 22.

172. Clarke, *supra* note 166, at 340.

173. Mark A. Lemley & Bhaven Sampat, *Is the Patent Office a Rubber Stamp?*, 58 EMORY L.J. 181, 182 (2008).

174. Carley, Hegde & Marco, *supra* note 170, at 210–12 (discussing the decline in allowance rates for applications filed between 1996 and 2005 and examined before June 30, 2013

view that examination quality at the USPTO has been declining. Yet another study recognizes both the lack of empirical confirmation and widespread assertion of the “rubber stamp” view, stating (as of 2015) that “there exists little to no compelling empirical evidence that the [USPTO] is *actually* over-granting patents.”<sup>175</sup> The authors then present data supporting a more nuanced view that certain institutional features of the USPTO application process (in particular, the practical impossibility of finally rejecting an application), combined with a significant application backlog, induce examiners to favor approving certain categories of “invalid” patent applications.<sup>176</sup>

In short: measuring examination quality at the USPTO is a complex empirical undertaking, but — even subject to certain inherent levels of imprecision — it is clear that the USPTO’s grant rate does not even approach the “rubber stamp” assertion that had been so widely repeated in policy commentary. Rather, all existing studies (to my knowledge) that use formal empirical methods reach annual average grant rates during the mid-1980s through the mid-2010s that fall approximately in the 60–75% range, with some variation over time (in particular, 1998–2002, when rates sometimes exceeded 75% by certain estimates), across technology classes, and by rate calculation methodology.<sup>177</sup> To be clear, this state of uncertainty over grant rates does not preclude the possibility that the USPTO is erroneously granting a material number of patents that would be deemed to be invalid upon further examination. Even taking into account the marginal costs involved in taking efforts to increase examination quality, our current state of knowledge also does not necessarily recommend a “do nothing” approach on the patent examination process. It does mean, however, that any sensible policy action requires taking into account that error costs

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and analyzing the extent to which the decline is attributable to the fact that “the USPTO introduced several procedures in 2000 that increased scrutiny of patent applications”).

175. Michael D. Frakes & Melissa F. Wasserman, *Does the U.S. Patent and Trademark Office Grant Too Many Bad Patents? Evidence from a Quasi-Experiment*, 67 STAN. L. REV. 613, 615 (2015).

176. *Id.* at 616–17 (discussing factors that may lead the USPTO to over-grant invalid patents, namely, “the inability of the PTO to reject a patent application with finality . . . [because] [t]he capacity of aggrieved patent applicants to continuously restart the examination process upon rejection by filing repeat applications can potentially overwhelm the existing examination infrastructure”).

177. On this point, see Dennis Crouch, *What is the Steady-State Patent Allowance Rate?*, PATENTLYO.COM (Nov. 4, 2016) <https://patentlyo.com/patent/2016/11/steady-patent-allowance.html> [<https://perma.cc/VE7R-N7KR>] which, based on USPTO Chief Economist data and without making adjustments for continuation applications, found that the annual average grant rate at the USPTO ranged between 60% and 70% for the period 1985–2016, except for 1998–2004, when it usually exceeded 70% and sometimes exceeded 75% during 1998–2002. I note that a previous study had similarly found a somewhat higher grant rate range between 68.4% and 78.1%, after making necessary adjustments for continuation applications, but based on a limited sample consisting only of published patent applications filed in January 2001. See Lemley & Sampat, *supra* note 173, at 192.

are an inevitable by-product of any upward *or* downward shift in examination thresholds. Any effort to screen out “bad” patents by increasing examination efforts both consumes social resources<sup>178</sup> and runs the risk of screening out “good” patents (or doing so implicitly by enabling opportunistic challenges by well-resourced parties against “good” patents held by under-resourced innovators). Conversely, *not* increasing examination efforts will save on personnel costs and other related expenditures but inevitably fail to screen out some “bad” patents, leading to litigation and other social costs that could otherwise have been avoided. As will be discussed in the next Section, USPTO leadership has recently undertaken what appear to be sensibly incremental refinements to the PTAB process that reflect awareness of these twin dangers of “overshooting” and “undershooting” the efficient level of examination quality. Interestingly, these actions concurrently respond to some of the process-related concerns expressed in recent Supreme Court jurisprudence on the PTAB.<sup>179</sup>

### B. The PTAB Rollout

The IPR proceeding can be simply described as a two-stage process: at stage one, the PTAB panel determines whether to institute the claim for final adjudication, based on a “reasonable likelihood” standard;<sup>180</sup> at stage two, the PTAB panel determines whether one or more of the challenged claims fails to satisfy either the novelty or nonobviousness standards (the only grounds on which an IPR petitioner can challenge a patent), in light of qualifying prior art submitted by the petitioner.<sup>181</sup> In the PTAB’s early years of operation (starting in 2012), petitioners who challenged the validity of a patent had an easy time achieving institution and then invalidating at least one claim of a challenged patent. USPTO data for petitions filed at the PTAB in 2013 through the three patent challenge mechanisms (of which IPR petitions

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178. On the tradeoffs involved in increasing examination quality, with an emphasis on the marginal costs and benefits of increased personnel and personnel time, see generally Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495 (2001), which explores the tradeoff between spending more resources on screening out low-quality patents in the examination process versus doing so through the litigation process, especially in light of the fact that most issued patents are never asserted against alleged infringers.

179. See *supra* Sections III.A and B.

180. 35 U.S.C. § 314(a) (providing that the “Director may not authorize an inter partes review to be instituted unless the Director determines that the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition”).

181. 35 U.S.C. § 311(b) (providing that a “petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and only the basis of prior art consisting of patents or printed publications”).

constituted the overwhelming majority<sup>182</sup>) indicates that almost 90% of such petitions were instituted.<sup>183</sup> Thereafter the rate declined significantly, stabilizing at slightly above 60% by 2017, which persisted through 2019<sup>184</sup> and then fell to 56% in 2020.<sup>185</sup> If a petition proceeds to institution, then the chances of invalidating at least one claim of the challenged patent are high. USPTO data from September 2012 to March 2020 indicates that 62% of all instituted claims that reached a final written decision were invalidated in full and 18% were invalidated in part.<sup>186</sup> Put differently, since the inception of the PTAB, 80% of all instituted patents that reached a final written decision have resulted in at least one claim being invalidated. Data for 2019 and 2020 shows no significant change from this historical norm: 79% and almost 83%, respectively, of all instituted petitions that reached a final written decision resulted in at least one claim being invalidated.<sup>187</sup>

The big picture is clear: once the institution hurdle is overcome, the PTAB mechanism (mostly, the IPR process) supplies a promising venue for petitioners with sufficient resources to challenge an issued patent on novelty or nonobviousness grounds using qualifying prior art. However, it is the interpretation of these tendencies that remains unsettled. Without further inquiry, the historical tendencies in PTAB outcomes support two interpretations (and any combination thereof). On the one hand, the initially high institution rates and, among instituted claims, the continuing high invalidation rates could indicate that the USPTO had previously been issuing large numbers of low-value patents consistent with the standard “junk patents” claim. In that case, the PTAB’s apparent vigilance would be a welcome intervention. On the

182. IPR petitions constituted 93% of all PTAB patent-challenge petitions filed during September 2012 to March 2020, *see* USPTO, Trial Statistics, *supra* note 159, at 3.

183. *Id.* at 6. Note that this figure excludes petitions that were filed but then settled or withdrawn prior to a decision on institution.

184. *Id.*

185. U.S. PAT. & TRADEMARK OFF., PTAB TRIAL STATISTICS, FY21 Q1 OUTCOME ROUNDUP IPR, PGR, CBM 6 (Dec. 2020), [https://www.uspto.gov/sites/default/files/documents/ptab\\_aia\\_fy2021\\_q1\\_roundup.pdf](https://www.uspto.gov/sites/default/files/documents/ptab_aia_fy2021_q1_roundup.pdf) [<https://perma.cc/V7DK-C7ES>] [hereinafter USPTO, FY21 PTAB Trial Statistics].

186. USPTO, Trial Statistics, *supra* note 159, at 10. Note that actual institution rates are higher if measured on a per-patent, rather than per-petition, basis. *See* U.S. PAT. & TRADEMARK OFF., BOARDSIDE CHAT: NEW DEVELOPMENTS 8–9 (June 11, 2020), [https://www.uspto.gov/sites/default/files/documents/PTAB\\_boardside\\_chat\\_new\\_trial\\_stats\\_and\\_operational\\_faqs\\_06\\_11\\_2020.pdf](https://www.uspto.gov/sites/default/files/documents/PTAB_boardside_chat_new_trial_stats_and_operational_faqs_06_11_2020.pdf) [<https://perma.cc/UY2V-GSH2>] [hereinafter USPTO, New AIA trial statistics]. A per-patent measure of institution success may be more relevant given that some petitioners pursue a strategy of filing multiple petitions against the same patent, with each petition directed at a different claim. For further discussion, *see* Josh Malone, *PTAB Institution Data Analysis Proves that Reforms Have Failed*, IPWATCHDOG.COM, (May 21, 2020), <https://www.ipwatchdog.com/2020/05/21/ptab-institution-data-analysis-proves-reforms-failed/id=121440/> [<https://perma.cc/JT43-SWHX>].

187. For 2019, *see* USPTO, New AIA trial statistics, *supra* note 186, at 16; for 2020, I calculated this rate based on USPTO, FY21 PTAB Trial Statistics, *supra* note 185, at 9.

other hand, the data is at least equally consistent with the view that the PTAB is “overshooting” and erroneously screening out high-value patents, which in turn may have deleterious effects on innovation markets. In particular, some observers have argued that the PTAB mechanism has sometimes been used opportunistically by large, well-resourced firms against smaller entrants for strategic purposes,<sup>188</sup> possibly resulting in “false positive” errors in which the PTAB invalidates “good” patents held by innovative but less well-resourced firms.<sup>189</sup>

There is some reason for concern on this last point in light of the fact that large technology incumbents are among the most active petitioners at the PTAB. From September 2012 to June 2016, twenty-five firms were responsible for 28% of all IPR petitions. The top five were Apple (213 petitions), Samsung (127), Microsoft (91), Google (87), and LG Electronics (81).<sup>190</sup> In 2019, the ranking remained roughly the same, comprising Apple (81), Samsung (56), Microsoft (50), Google (44), and Unified Patents (43),<sup>191</sup> the last entity being an intermediary that (among other services) files PTAB petitions on behalf of corporate clients. Together these top five petitioners represented slightly more than 20% of all IPR petitions filed in 2019.<sup>192</sup> Of equal concern, these same firms employ petition strategies in which multiple petitions are filed concurrently or sequentially by a single firm against the same patent claim or claims.<sup>193</sup> One study found that, of the IPR petitions filed by Microsoft, Apple, Google, Samsung, and LG from September 2012 through June 2018, respectively, 59%, 56%, 38%, 38%, and 34%, were duplicative (that is, a petition challenged at least one patent that was also challenged in another petition by the same filer).<sup>194</sup> While some of these petitions may be directed at deterring nuisance patent litigation strategies or in response to the high percentage of infringement suits

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188. ALL. FOR U.S. STARTUPS & INVENTORS FOR JOBS, HOW “ONE BITE AT THE APPLE” BECAME SERIAL ATTACKS ON HIGH QUALITY PATENTS AT THE PTAB 4 (Oct. 17, 2018).

189. Josh Malone shows that there is a strong correlation between the number of petitions filed against a single patent and the likelihood that at least one such petition will be instituted against the patent. See Malone, *supra* note 186 (showing that, from September 2012 to May 2020, patents against which one IPR petition was filed were instituted 63% of the time on average, while patents against which six or more IPR petitions were filed were instituted 96% of the time on average).

190. Pedram Sameni, *Patexia Insight 12: Top 25 IPR Petitioners Filed Nearly 30 Percent of All Challenges*, (Sept. 21, 2016), <https://www.patexia.com/feed/weekly-chart-top-25-ipr-petitioners-20160920> [<https://perma.cc/DRZ2-8SE8>].

191. *Annual PTAB Report (2019)*, UNIFIED PATENTS, <https://portal.unifiedpatents.com/ptab/annual-report?year=2019> [<https://perma.cc/J4U6-2M4S>].

192. Author’s calculations, based on UNIFIED PATENTS, *supra* note 191.

193. ALL. FOR U.S. STARTUPS & INVENTORS FOR JOBS, *supra* note 188, at 2.

194. Steven Carlson & Ryan Schultz, *Tallying Repetitive Inter Partes Review Challenges*, LAW360 (Sept. 14, 2018), <https://www.law360.com/articles/1083158/tallying-repetitive-inter-partes-review-challenges> [<https://perma.cc/6YF8-X7W7>].

brought against large technology firms,<sup>195</sup> the significant percentage of petitions directed at operational companies (43% as of 2019)<sup>196</sup> runs counter to the common understanding that the IPR mechanism principally deters opportunistic patent litigants that lack any meaningful R&D or other non-licensing business functions.

If the IPR mechanism is at least sometimes being used by incumbents to impede entry or reduce the costs of acquiring required technology inputs<sup>197</sup> (rather than to deter opportunistic litigation or licensing demands by the holders of low-value patents), then a socially undesirable domino effect could ensue in which smaller firms decline to apply for patents or to enforce issued patents or, in the absence of a credible litigation risk, are compelled to agree to “low-ball” settlements with better-resourced alleged infringers. These contingencies are at a minimum plausible in a litigation environment in which it is now often expected that patents must be simultaneously litigated in district court and the PTAB,<sup>198</sup> at significant cost and with limited likelihood of achieving a successful outcome in both venues. In a case involving parallel IPR and federal court proceedings, the patentee must achieve all of the following steps: (i) survive a validity challenge on novelty or nonobviousness grounds in the IPR proceeding; (ii) survive a potential additional validity challenge on other grounds in the court proceeding; (iii) demonstrate infringement; (iv) demonstrate damages and/or show

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195. This possibility is suggested by the fact that, at least as of 2018, almost all of the technology firms that rank among the most frequent IPR petitioners (Microsoft being the exception) also rank among the most frequent defendants in patent infringement litigations, see MORGAN LEWIS LLP, 2019 PTAB DIGEST: THE LATEST TRENDS AND DEVELOPMENTS IN POST-GRANT PROCEEDINGS 12–13 (2019), <https://www.morganlewis.com/-/media/files/publication/report/2019-ptab-digest.pdf> [<https://perma.cc/UH2A-FLNW>] (noting that Apple, Google, LG, Amazon and Samsung were defendants in the greatest number of patent infringement suits in 2018).

196. According to Unified Patents, 43% of challenged patent owners in PTAB proceedings were operating companies, 11% were non-practicing small companies, and almost 45% were patent assertion entities, in each case for the year 2019. See *2019 Patent Dispute Report — Year in Review*, UNIFIED PATENTS (Jan. 1, 2020), <https://www.unifiedpatents.com/insights/2019/12/30/q4-2019-patent-dispute-report> [<https://perma.cc/9D6V-YVKJ>]. For purposes of these calculations, the report defines a “non-practicing small company” as an “[e]ntity whose original activity was providing products and services, but is now primarily focused on monetizing its own patent portfolio,” while a patent assertion entity is an “[e]ntity whose primary activity is licensing patents and acquired most of its patents from another entity.” *Id.*

197. In one well-documented case, Apple purportedly undertook a multiple petition strategy at the PTAB against a patentee whose technology Apple had allegedly used to develop the Apple Watch. The strategy ultimately induced a settlement with the patentee. See Steven C. Carlson, *Weaponizing IPRs*, 12 LANDSLIDE 1, 3–4 (2019).

198. As of 2016, approximately one-third of patents at issue in a district court litigation were concurrently being challenged in a PTAB proceeding, see ASS’N CORP. COUNS., *supra* note 145, at 30, and between 2011 and 2015, 86% of patents being challenged in an IPR or covered business method patent proceeding were concurrently being litigated in federal court, see Saurabh Vishnubhakat, Arti K. Rai & Jay P. Kesan, *Strategic Decision Making in Dual PTAB and District Court Proceedings*, 31 BERKELEY TECH. L.J. 45, 69 (2016).

that injunctive relief is merited under the *eBay* four-factor test<sup>199</sup>; and (v) potentially survive an appeal of an infringement finding, injunction, or damages award. These proceedings can require an investment of millions of dollars on average in litigation costs.<sup>200</sup> In any infringement dispute involving a well-resourced alleged infringer and an individual or small-firm patentee, the former would enjoy disproportionate bargaining leverage in settlement negotiations, especially given the fact that current patent case law no longer consistently provides patentees with the ability to make a credible threat that they can secure injunctive relief even after having defended patent validity and demonstrated infringement.<sup>201</sup> In industry segments (whether defined by technology or firm type) in which firms clearly rely on patents to capture returns on innovation (for example, biopharmaceuticals and medical devices<sup>202</sup>), this could slow down the flow of new technologies or, as I have argued elsewhere, might disadvantage smaller, R&D intensive firms in a broader range of industries that rely on patents to extract returns on innovation through licensing and other relationships with larger producers and distributors.<sup>203</sup> Contrary to standard intuitions, patent reforms designed to “open up” markets may simply entrench incumbents that have the greatest resources and capacities to make strategic use of dispute resolution mechanisms in the courts and the PTAB.

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199. *eBay, Inc. v. MercExchange LLC*, 547 U.S. 388, 391 (2006) (setting forth four-factor test for awarding a permanent injunction in a patent infringement litigation).

200. According to a 2019 survey-based report of the American Intellectual Property Law Association, the median cost of a PTAB hearing involving an electrical or computer-related patent was \$325,000 (and \$450,000 through appeal), and the median cost of a patent infringement litigation (for \$10 to \$25 million at risk) was \$1.2 million through discovery and \$2.7 million through final adjudication. See AM. INTELL. PROP. LAW ASS'N, REPORT OF THE ECONOMIC SURVEY 50–52 (2019).

201. On the reduced likelihood of securing injunctive relief following the Supreme Court's 2006 decision in *eBay*, 547 U.S. 388, see Christopher B. Seaman, *Permanent Injunctions in Patent Litigation After eBay: An Empirical Study*, 101 IOWA L. REV. 1949, 1950–53, 1982–84 (2016).

202. On evidence relating to the differing extent to which R&D (and R&D monetization) relies on robust patent protection, see generally Jonathan M. Barnett, *Do Patents Matter? Empirical Evidence on the Incentive Thesis*, in HANDBOOK ON LAW, INNOVATION & GROWTH (Robert E. Litan ed., 2011).

203. BARNETT, INNOVATORS, FIRMS, AND MARKETS, *supra* note 10, at 115 (discussing how “a robustly enforced patent system promotes transactional choice and enables entry by R&D intensive innovator firms into markets that are otherwise dominated by vertically integrated incumbents”); Jonathan M. Barnett, *Intellectual Property as a Law of Organization*, 84 S. CAL. L. REV. 785, 788, 810, 829 (2011) (contending that weak patent rights can serve to elevate larger firms' position in the marketplace because unlike large firms, which have safeguards throughout the supply chain, “small firms and individual inventors most clearly depend on the patent system” because small firms “may have no production or distribution infrastructure”).

*C. Refining the PTAB*

During the leadership of Director Iancu (February 2018 to January 2021), the USPTO took actions to address some of the process concerns that, as discussed above,<sup>204</sup> several members of the Supreme Court had identified in recent opinions relating to the PTAB. Three key changes were implemented. First, in April 2018, the USPTO updated its IPR rules concerning the institution decision to conform to the Court's decision in *SAS Institute, Inc. v. Iancu*,<sup>205</sup> in which the Court had prohibited the practice of partial institution of challenged claims. Specifically, the PTAB must now elect to institute all challenged claims or none at all,<sup>206</sup> which is likely to lead petitioners to target only the claims that they feel are most likely to be instituted. Second, in October 2018, the USPTO replaced the "broadest reasonable interpretation" standard for claim construction in PTAB administrative review proceedings with the *Phillips* (or "ordinary and customary meaning") standard applied by federal district courts.<sup>207</sup> Third, in March 2019, the USPTO initiated a pilot program that provides patentees with greater opportunities to amend claims during a PTAB proceeding,<sup>208</sup> which followed a Federal Circuit decision that had mitigated the hurdles faced by patentees in amending patent claims in an IPR proceeding.<sup>209</sup> Everything else being equal, the last two changes tend to improve patentees' ability to survive a validity challenge. In particular, the narrower *Phillips* standard prevents challengers from arguing for broad claim constructions that capture more anticipatory prior art while increased amendment opportunities enable patentees to narrow claims to avoid anticipatory prior art. Together these changes may reduce even further the declining rates at which IPR petitioners have achieved institution and may reduce

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204. See *supra* Section III.B.

205. 138 S. Ct. 1348, 1353 (2018).

206. *Guidance on the Impact of SAS on AIA Trial Proceedings*, U.S. PAT. & TRADEMARK OFF. (Apr. 27, 2018), <https://www.uspto.gov/patents/ptab/trials/guidance-impact-sas-aia-trial> [<https://perma.cc/XQ8N-WAPD>].

207. U.S. Patent & Trademark Office, *Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board*, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (codified at 37 C.F.R. pt. 42). For the source of the *Phillips* standard, see *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (noting that "the ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application").

208. U.S. Patent & Trademark Office, *Notice Regarding a New Pilot Program Concerning Motion to Amend Practice and Procedures in Trial Proceedings Under the America Invents Act Before the Patent Trial and Appeal Board*, 84 Fed. Reg. 9497 (Mar. 15, 2019).

209. *Aqua Products, Inc. v. Matal*, 872 F.3d 1290, 1303 (Fed. Cir. 2017) (holding that petitioner in a PTAB proceeding bears burden of persuasion concerning the patentability of claim amendments by the patentee).



the high rates at which, following institution, challengers successfully invalidate at least one of the claims of a challenged patent.<sup>210</sup>

#### D. Refining Patent Examination

Concurrently with these changes to the PTAB mechanism, the USPTO has acted to clarify the principles applied by patent examiners in addressing applications that raise potential subject-matter eligibility concerns under the Supreme Court's 2014 decision in *Alice Corp. v. CLS International*.<sup>211</sup>

As noted in the Introduction,<sup>212</sup> the *Alice* decision emphasized the importance of the long-standing abstract ideas exclusion in determining whether an invention qualifies as patentable subject matter, specifically in the context of financial-method patents (the subject of the *Alice* litigation) but more broadly in the larger category of software-enabled inventions.<sup>213</sup> The *Alice* decision was followed by a significant increase in the invalidation of patents in infringement litigation on *Alice*-related grounds and a significant increase in the rejection of patent applications on those same grounds in first office actions during the examination process.<sup>214</sup>

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210. For data on these points, see *supra* notes 184–187 and accompanying discussion. The “everything else being equal” qualification is critical because the composition of the patentee population or the set of patents targeted by IPR petitioners could change in response to these increased hurdles for successfully defeating a patent through the IPR mechanism. The composition of the patentee population may change if a lower expected likelihood of a successful IPR challenge induces lower-quality applications to be filed. The composition of the set of challenged patents may change insofar as higher hurdles to a successful IPR challenge leads challengers to target lower-value and more vulnerable patents. Both responses would offset to some extent any expected decline in IPR institution or invalidation rates. As some readers may observe, this is an application of the Priest-Klein “selection effects” hypothesis. For the classic source, see George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUDS. 1, 4 (1984).

211. 573 U.S. 208 (2014).

212. See *supra* note 17 and accompanying text.

213. The *Alice* decision followed the Court's landmark decision in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66 (2012), in which the Court set forth a two-step process for addressing subject-matter challenges to patent eligibility under Section 101 of the Patent Act. In that framework, a court must first determine whether the claim limitation includes an abstract idea (which is therefore patent-ineligible) and, if so, must then determine whether the claim limitation nonetheless includes an “inventive concept” that falls within patent-eligible subject matter, see *id.*, at 70–74.

214. See *supra* notes 19–21; Andrew A. Toole & Nicholas A. Pairolero, *Adjusting to Alice: USPTO Patent Examination Outcomes After Alice Corp. v. CLS Bank Int'l*, IP DATA HIGHLIGHTS 3 fig.1 (Apr. 2020). A “first office” action is the first response by the examiner to a patent application, based on a review of the prior art and examination of the application. In response to a first office action that does not grant the application, the applicant can choose to withdraw the application or amend the claims in response to the examiner's concerns. For an accessible review of the patent prosecution process, see Gene Quinn & Michael Benson, *Understanding U.S. Patent Prosecution*, IPWATCHDOG.COM (June 30, 2018), <https://www.ipwatchdog.com/2018/06/30/understanding-u-s-patent-prosecution/id=98955/> [<https://perma.cc/R3QR-EGYY>].

In April 2018, the USPTO issued the so-called “Berkheimer” memorandum,<sup>215</sup> which was formalized as “Revised Patent Subject Matter Eligibility Guidance” in January 2019.<sup>216</sup> The “Berkheimer” memorandum, relying on a decision by the Federal Circuit,<sup>217</sup> required examiners to identify factual support for a determination that a particular element of a patent application was a “well-understood, routine, conventional activity.”<sup>218</sup> In the context of software-related inventions, such a determination would tend to support rejection of an application on grounds that it lacks an “inventive concept” and, given the fact that a software-related invention typically implicates the abstract ideas exclusion, therefore constitutes patent-ineligible subject matter.<sup>219</sup> The 2019 guidance reiterated this same principle and further emphasized the distinction between a “stand-alone” abstract idea, which falls outside of patentable subject matter, and an abstract idea implemented as part of a “practical application,” which would qualify as patentable subject matter (and could then lead to patent issuance assuming all other patentability requirements were deemed to be satisfied).<sup>220</sup>

The effect of these heightened bars to reaching an ineligibility determination on subject-matter grounds has been clear. The percentage of first office actions resulting in rejection on subject-matter eligibility grounds of “*Alice*-affected technologies” has fallen from approximately 35% as of April 2018 (when the memorandum was released) to slightly less than 30% as of January 2019 (when the guidance was released) and

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215. Memorandum from Robert W. Bahr, Deputy Comm’r for Patent Examination Pol’y, to Patent Examining Corps (Apr. 19, 2018) [hereinafter USPTO, 2018 Memorandum].

216. 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (finalized Jan. 7, 2019).

217. *Berkheimer v. HP, Inc.*, 881 F.3d 1360, 1367–69 (Fed. Cir. 2018) (holding that whether a patent’s claim limitations constitute “well-understood, routine, conventional [activity] to a skilled artisan in the relevant field” is a factual issue and therefore cannot be the basis for a summary judgment finding that a patent claim is subject-matter ineligible under Section 101 of the Patent Act).

218. USPTO, 2018 Memorandum, *supra* note 215, at 1–2.

219. For readers who wish for greater detail, this point relates to the two-step analytical framework for determining patent eligibility on subject-matter grounds, as articulated by the Supreme Court in *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 217–18 (2014), and *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66, 71–73 (2012). Following that framework, a court that finds that an invention encompasses an “abstract idea” (or some other subject matter conventionally excluded from patent protection as a matter of case law) must then inquire whether the invention nonetheless includes an “inventive concept” that falls within patentable subject matter. *Id.* If a patent claim (i) implicates an abstract idea (as would likely be the case in most software-enabled inventions); and (ii) otherwise constitutes a “well-understood, routine, conventional” practice in the relevant field, then it would lack an inventive concept and be deemed patent ineligible on subject-matter grounds. *Alice*, 573 U.S. at 225.

220. USPTO, 2019 Guidance, *supra* note 216, at 53 (“[T]he Supreme Court has long distinguished between principles themselves (which are not patent eligible) and the integration of those principles into practical applications (which are patent eligible).”).

had stabilized at approximately 20% as of January 2020.<sup>221</sup> That is almost exactly the level at which those same set of technologies had been rejected in first office actions just prior to the *Alice* decision in 2014.<sup>222</sup> Additionally, uncertainty in the examination of patent applications for *Alice*-affected technologies — measured by the “variability in patent subject matter eligibility determinations across examiners in the first action stage of examination”<sup>223</sup> — declined by 44% in the 12-month period following formal issuance of the Berkheimer memorandum in January 2019.<sup>224</sup> In short: without any change in case law or statutory intervention, the USPTO has reduced significantly the effect of *Alice* in the context of patent examination.<sup>225</sup>

### E. Putting It All Together

There is at least reasonable ground to believe that the USPTO’s refinement of the PTAB mechanism, and the issuance of the “Berkheimer” memo and associated guidance at the patent examination stage, may reflect a healthy rebalancing that now does a better job at trading off the inevitable mix of “false positive” and “false negative” errors in examination and post-examination processes. At a minimum, it shows a more nuanced approach that recognizes that any combination of examination and post-examination mechanisms necessarily gives rise to both types of errors and that our empirical understanding of the net effects of increased investments in examination quality and design is inherently limited. It is possible that the moderate decline in petitioners’ institution rates at the PTAB could reflect an unwise reduction in the PTAB’s level of scrutiny, resulting in “false negative” results in which “bad” patents are permitted to survive. The same could be said of the moderate decline in patent applicants’ rejection rates on *Alice*-related

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221. Toole & Pairolero, *supra* note 214, at 5 fig.3.

222. *See id.* at 3 fig.1.

223. *See id.* at 1.

224. *See id.* at 7.

225. I note that we cannot exclude the possibility that the reversion to the pre-*Alice* rate of rejections reflects to some extent the fact that the composition of the pool of patent applications has changed as patent applicants have adapted over time to the stricter *Alice* standard of subject-matter eligibility, incrementally resulting in a higher-quality pool of patent applicants, which in turn pushes down the rejection rate. If that were true, then this would constrain the ability to attribute the reduction in the rejection rate to the changes in USPTO examination guidelines as described above. This line of argument is an application of the Priest-Klein “selection effects” hypothesis, *see generally* Priest and Klein, *supra* note 210, which counterintuitively argues that changes in legal standards do not impact litigation outcomes due to changes in the composition of claims being litigated. As a subsequent theoretical literature has shown, the circumstances under which the Priest-Klein hypothesis will be realized are limited, which both gives rise to the possibility that the hypothesis may often only be partially realized and may explain why empirical tests of the Priest-Klein hypothesis have reached mixed results. For discussion, see Yoon-Ho Alex Lee & Daniel Klerman, *The Priest-Klein Hypothesis: Proofs and Generality*, 48 INT’L REV. L. & ECON. 59, 59–61 (2016).

subject-matter ineligibility grounds in the examination process.<sup>226</sup> However, the observed results of both these policy changes are at least also consistent with the view that the PTAB mechanism on the “back end” and the examination mechanism on the “front end” have been appropriately adjusted to avoid “false positive” errors that mistakenly screen out “good” patents or induce opportunistic challenges by large-firm infringers with greater litigation resources relative to a patent owner. Additionally, the preponderance of large-firm incumbents among the PTAB petitioner pool and the large number of operating companies among the PTAB patent owner pool suggest that the over-screening risk is far from an implausible or atypical scenario. Just as raising examination standards screens out “bad” patents and deters opportunistic litigation by patent owners, raising institution standards screens out “bad” patent challenges and deters opportunistic strategies by infringers.

## V. CONCLUSION

In his landmark work, *The Structure of Scientific Revolutions*, Thomas Kuhn famously described the dynamics of a paradigm shift. While the phrase has achieved wider adoption across a variety of contexts, Kuhn used the phrase specifically to refer to a sequence of developments in which the consensus in a scholarly or other community shifts over time in response to changing factual understandings of a particular subject of scientific or other inquiry.<sup>227</sup> As anomalies build up, the existing theoretical structure must be amended until it is ultimately displaced by a theory that exhibits superior explanatory fit with the relevant set of phenomena. As Kuhn observed, any such shift can take a considerable period of time, in part because persons and groups that are invested in the existing paradigm are resistant to discarding it.<sup>228</sup> In issues that involve the intersection of (i) scholarly inquiry, the province of the academy; (ii) policy design, the province of political institutions; and (iii) business interests, the province of the market, this Kuhnian interaction between theory, fact, and private interest is rendered even more complex given the fact that certain business constituencies or advocacy groups may have economic or ideological commitments that favor or disfavor the status quo, independent of the explanatory merits of one paradigm relative to another.

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226. See *supra* note 221 and accompanying text.

227. See THOMAS S. KUHN, *THE STRUCTURE OF SCIENTIFIC REVOLUTIONS* 150–57 (1962) (observing that a dominant scientific paradigm is challenged when researchers assemble a sufficient body of empirical anomalies and other contrarian evidence).

228. *Id.* at 157 (observing that researchers invested in the dominant scientific paradigm resist adoption of the new paradigm, but the new paradigm can ultimately prevail if it demonstrates stronger explanatory force with respect to the relevant set of empirical phenomena).

In the field of patent scholarship and policy, we may currently be in the midst of a similar, although certainly still-emergent, paradigm shift in the intersecting spheres of the scholarly, policymaking, and interested business and advocacy communities. For some time, the patent policy conversation has been dominated by a narrative of “decline and reform” in which the patent system was allegedly captured by certain private interests, resulting in a state of affairs in which patents were issued and enforced at robust levels, followed by a reform process that has sensibly moderated the strength of patent protection. This “moderation” process has in some cases eroded *immoderately* some of the most “property-like” features of a patent right, starting with the *eBay* decision in 2006<sup>229</sup> (and the follow-on case law), running through the effective denial of injunctive relief to SEP owners,<sup>230</sup> and culminating in the *Oil States* decision in 2018 that deemed patents to be a public franchise, possibly endowed with certain property-like characteristics.<sup>231</sup> An accumulating body of evidence suggests that the conventional narrative of decline may often have relied on imprecise characterizations of the real-world effects of the patent system put in place in the early 1980s. If that is the case, then reforms undertaken since the mid-2000s to “protect” the public against purportedly excessive patent protections may have been at best unnecessary and at worst counterproductive. It is especially suggestive that, with few exceptions, large technology incumbents outside the pharmaceutical industry have been the strongest advocates for *weakening* patent protections.<sup>232</sup>

To be clear, each of the conventional assumptions discussed in this Article, including the patent holdup, royalty stacking, and “junk patents” assertions, still deserve further empirical inquiry to understand more precisely the extent of these phenomena, which may turn out to retain some reasonable measure of material relevance. Also, to be clear, this Article has only addressed the factual deficiencies of *some* of the policy failures regularly attributed to the patent system inaugurated by the Federal Circuit and the Bayh-Dole Act in the early 1980s.<sup>233</sup> At a

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229. See *eBay, Inc. v. MercExchange, LLC*, 547 U.S. 388 (2006).

230. See *supra* notes 44–46 and accompanying text.

231. See *supra* note 121 and accompanying text. On the conversion of patent rights from property-rule-protected to liability-rule-protected entitlements, see *supra* note 52 and accompanying text. For related discussion on these points, see generally Jonathan M. Barnett, *The Long Shadow of the Blackberry Shutdown That Wasn't*, CTR. PROT. INTELL. PROP., July 2020 <https://cpip.gmu.edu/wp-content/uploads/sites/31/2020/07/Barnett-Long-Shadow-of-the-Blackberry-Shutdown.pdf> [<https://perma.cc/VZC4-B9W5>].

232. See BARNETT, INNOVATORS, FIRMS, AND MARKETS, *supra* note 10, at 139–50; Barnett, *Quasi-Fallacies*, *supra* note 10, at 29–39. As I observe in those publications, large technology incumbents may strategically advocate for weak patent protections to the extent smaller entrants rely on those protections and are therefore disadvantaged in a weak-IP environment.

233. In particular, I did not address deficiencies in the factual support for the widely held “anticommons” or “patent thicket” thesis, according to which dispersed holdings of large numbers of patents give rise to transaction costs and deadweight losses that raise prices and

minimum, however, existing empirical evidence is now sufficiently developed that there must be considerable doubt as to whether the alleged “failures” of the patent system were sufficiently clear to warrant the significant reductions in patent protection that have been undertaken over the past decade by the Supreme Court, Congress, and antitrust regulators. In the face of this empirical uncertainty, and growing evidence that in some cases there may have been no material “failure” at all, it may be time for policymakers to reconsider whether some of those reforms themselves were “excessive” and may have placed at risk the innovation economy that the patent system is designed to support and promote.

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deter innovation. The “stacking” hypothesis can be understood as a special application of this thesis to multi-component technologies in the smartphone and related computing and communications markets. For a critical review of the evidence relating to this assertion, see generally Jonathan M. Barnett, *The Anti-Commons Revisited*, 29 HARV. J.L. & TECH. 127 (2015). Nor did I address factual deficiencies that have been observed in the estimated social costs attributed to purportedly opportunistic infringement litigation undertaken by non-practicing entities (also known as “patent trolls”). For a nuanced discussion of these new-found complexities, based on a critical review of existing evidence and new empirical findings, see generally Christopher A. Cotropia, Jay P. Kesan & David L. Schwartz, *Unpacking Patent Assertion Entities*, 99 MINN. L. REV. 649 (2014); Christopher A. Cotropia, Jay P. Kesan & David L. Schwartz, *Heterogeneity Among Patent Plaintiffs: An Empirical Analysis of Patent Case Progression, Settlement, and Adjudication*, 15 J. EMPIRICAL LEGAL STUDS. 80 (2018).