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Unregistered Patents

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UNREGISTERED PATENTS

Miriam Marcowitz-Bitton* and Emily Michiko Morris**

Abstract: Although all should be treated equally under the law, patent law has long been known to favor some less than others. Patentable technology is highly heterogeneous, covering everything from minute improvements in electronics to pioneering new artificial organs, but patent protection itself is purely a one-size-fits-all system. Patents thus overreward some while underrewarding others. On the one hand, patents overreward low-investment, low-value inventions by granting them the same twenty-year term of protection as those that required much higher investments and yield much higher social value. The resulting glut of low-quality patents has contributed greatly to the “patent crisis” of opportunistic “patent trolls,” heightened transaction costs, and costly litigation that have ultimately stalled innovation. On the other hand, patents also underreward in two significant ways. First, patents often fail to give some high-investment, high-value inventions enough protection. Second, many inventors are shut out from patent protection altogether if they lack the resources necessary to navigate the patent system’s costly, complex, and frequently biased examination process. This latter phenomenon disproportionately affects female and minority inventors, among others, thereby creating significant distributive effects.

This Article argues that both of these effects—the overprotection of low-value inventions and the underprotection of inventions by women and minorities—could be alleviated by altering one particular but seldom-appreciated aspect of the patent system’s one-size-fits-all approach: its registration-only design. Copyright and trademark law allow for both registered and unregistered rights, but the patent system grants rights only to those who register their inventions and undergo subsequent examination. If the patent system were to follow the two-tiered approach of copyright and trademark law, however, and implement a regime of automatic but very limited unregistered rights in addition to registered rights, it could help address both problems. First, providing a much lower-cost alternative for obtaining protection, such a two-tiered regime could, with varying degrees of aggressiveness, channel low-investment, low-value inventions away from the system-clogging overprotections of the full, twenty-year, broad rights currently granted to registered patents. Second, as the authors of this Article have previously argued, by providing automatic rights without having to go through the resource-intensive registration and examination process, unregistered patent protection could help women and other disadvantaged inventors gain greater access to patent protections. Maintaining a two-tiered regime of both registered and unregistered patent rights thus offers a promising way to mitigate the inefficiencies of the current system by attenuating certain aspects of the current patent crisis while promoting a more egalitarian playing field for inventors.

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INTRODUCTION

Law is generally seen as most efficient when it incentivizes beneficial behavior and disincentivizes harmful behavior. Patent law, for example, is designed to encourage technological innovation¹ by granting qualified inventors the exclusive rights to make, use, sell, or license their inventions against all others for a period of twenty years.² This rather robust, if relatively brief, exclusivity is thought to incentivize investment in innovation by giving inventors the potential to earn supracompetitive returns.³ Yet, the patent system has been under fire in the last few decades for stifling innovation by both overprotecting some inventions and

1. As allowed under the so-called IP clause of the U.S. Constitution. U.S. CONST. art. I, § 8, cl. 8 (granting Congress the enumerated power “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries”).

2. See 35 U.S.C. § 154(a)(2) (Supp. 2012).

3. See Christopher A. Cotropia, “After-Arising” Technologies and Tailoring Patent Scope, 61 N.Y.U. ANN. SURV. AM. L. 151, 168–71 (2005); Mark A. Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129, 129–30 (2004).

underprotecting others.⁴

Most critics blame this on the one-size-fits-all nature of the patent system, in which all inventions receive the same rights for the same length of time, regardless of the nature of the underlying technology, the magnitude of investment necessary to achieve it, or the overall social value that it creates.⁵ A previously unappreciated fact, however, is that these problems stem from more than just the patent system's failure to tailor rights or duration. It is also the patent system's inflexibility as to how those rights are acquired that causes problems of both under- and overprotection. The patent system grants rights only through registration (application) and examination. This means that, on the one hand, the patent system gives inventors only one choice—either forgo protection altogether or invest significant resources in going through the patent examination process. For many inventors this is in practice no choice at all, as the patent system's costly, complex, and frequently biased examination process hampers their ability to obtain patent protections, regardless of the value of their inventions. On the other hand, the patent system grants the same twenty years of robust rights to all inventions, regardless of how much protection those inventions actually merit or need, often leading to an excess of patent rights that serve more to hamper than to facilitate technological progress.

The patent system is an outlier among intellectual property (IP) regimes in granting only registered rights, however. Both copyright law and trademark law accord unregistered as well as registered rights and vary the protections allowed under each. If the patent system were to adopt a similarly two-tiered regime, it would put the patent system in line with the longstanding approaches taken in both copyright and trademark law. More importantly, such a relatively simple modification to the patent system would also furnish it with a very useful tool, both for avoiding overprotection of inventions of marginal value and for avoiding underprotection of inventions by those for whom registration and examination is an undue burden.

The most obvious way in which a two-tiered regime would assuage the inflexibilities of the patent system is by providing unregistered rights for inventors who might otherwise be unable to obtain them. Access to patent protection is not equal. Empirical research has repeatedly shown that specific groups such as women, racial and ethnic minorities, and

4. See JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 2 (2008); Maureen K. Ohlhausen, *Patent Rights in a Climate of Intellectual Property Rights Skepticism*, 30 HARV. J.L. & TECH. 103, 110–11 (2016).

5. DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT 3–4, 136–37 (2009).

entrepreneurs are consistently underrepresented among patentees.⁶ For example, women file patent applications at disproportionately lower rates than men, even when controlling for male-to-female ratios and other variables among inventors.⁷ Racial and ethnic minorities show a similarly disproportionate gap in patent applications filed.⁸ As the authors have previously shown elsewhere, this is in large part because simply filing a patent application can require tens of thousands of dollars, years of time, and in-depth knowledge of the patent system.⁹ On average, however, female and minority inventors have less access to the kind of funding, networks, and other support structures critical to navigating the patenting process.¹⁰ Moreover, studies show that women and minorities also face inherent biases in the examination process.¹¹ Recent studies indicate that patent applications filed by women and certain ethnic and racial minorities are more likely to be rejected than those by white male applicants and,

6. See Dana Kanze, Laura Huang, Mark A. Conley & E. Tory Higgins, *We Ask Men to Win and Women Not to Lose: Closing the Gender Gap in Startup Funding*, 61 ACAD. MGMT. J. 586, 586 (2018); JESSICA MILLI, EMMA WILLIAMS-BARON, MEIKA BERLAN, JENNY XIA & BARBARA GAULT, INST. FOR WOMEN'S POL'Y RSCH., EQUITY IN INNOVATION: WOMEN INVENTORS AND PATENTS 3–8, 11–12 (2016), <https://iwpr.org/wpcontent/uploads/wpallimport/files/iwprexport/publications/C448%20Equity%20in%20Innovation.pdf> [<https://perma.cc/6ZDA-UUFV>]; see also BERNA DEMIRALP, LAURA MORRISON & STEPHANIE ZAYED, NAT'L WOMEN'S BUS. COUNCIL, ON THE COMMERCIALIZATION PATH: ENTREPRENEURSHIP AND INTELLECTUAL PROPERTY OUTPUTS AMONG WOMEN IN STEM 22–24 (2017), <https://s3.amazonaws.com/nwbc-prod.sba.fun/wp-content/uploads/2017/03/13133831/STEM-Commercialization-website-ready.pdf> [<https://perma.cc/5P8V-PMMW>].

7. Gema Lax Martinez, Julio Raffo & Kaori Saito, *Identifying the Gender of PCT Inventors* 8 (Econ. & Stat. Series, Econ. Rsch. Working Paper No. 33, 2016); Waverly W. Ding, Fiona Murray & Toby E. Stewart, *Gender Differences in Patenting in the Academic Life Sciences*, 313 SCI. 665, 665 (2006); Kjersten Bunker Whittington, *Mothers of Invention? Gender, Motherhood, and New Dimensions of Productivity in the Science Profession*, 38 WORK & OCCUPATIONS 417, 418–20 (2011); Kjersten Bunker Whittington & Laurel Smith-Doerr, *Women Inventors in Context: Disparities in Patenting Across Academia and Industry*, 22 GENDER & SOC'Y 194, 203–07 (2008).

8. W. Michael Schuster, R. Evan Davis, Kourtenay Schley & Julie Ravenscraft, *An Empirical Study of Patent Grant Rates as a Function of Race and Gender*, 57 AM. BUS. L.J. 281, 317–18 (2020) (“Our analysis of more than 3.9 million patent applications provides evidence that patents are not equally available to some segments of society. Both women and minority inventors are less likely to have their patent applications granted.”).

9. Miriam Marcowitz-Bitton & Emily Michiko Morris, *The Distributive Effects of IP Registration*, 23 STAN. TECH. L. REV. 306, 345–47, 356–58 (2020).

10. ALICIA ROBB, ACCESS TO CAPITAL AMONG YOUNG FIRMS, MINORITY-OWNED FIRMS, WOMEN-OWNED FIRMS, AND HIGH-TECH FIRMS 31 (2013), [https://www.sba.gov/sites/default/files/files/rs403tot\(2\).pdf](https://www.sba.gov/sites/default/files/files/rs403tot(2).pdf) [<https://perma.cc/MN2B-RGF3>]; Paula E. Stephan & Asmaa El-Ganainy, *The Entrepreneurial Puzzle: Explaining the Gender Gap*, 32 J. TECH. TRANSFER 475, 481 (2007); Ding et al., *supra* note 7, at 666.

11. Kyle Jensen, Balázs Kovács & Olav Sorenson, *Gender Differences in Obtaining and Maintaining Patent Rights*, 36 NATURE BIOTECHNOLOGY 307, 307 (2018); Schuster et. al., *supra* note 8, at 317–18.

even if not rejected, are more likely to be narrowed in scope.¹² If women, minorities, and other disadvantaged inventors did not have to go through the application and examination process—that is, if patent protections were automatic and did not require registration—inventors could avoid the costs and biases of patent registration, and the gender and racial disparities in patenting would be significantly narrowed.

Second, and less obvious, unregistered patent rights would also alleviate the rigidity of the current patent system by reducing overprotection of inventions. When the patent system underprotects inventions, it fails to provide adequate incentives to invest in research and development (R&D).¹³ When patents provide more protection than is needed, on the other hand, patent protection can be destructive by hindering downstream innovation.¹⁴ Such problems are most likely to arise when patents cover relatively small improvements that have little value by themselves but are instead most useful in coordination with other cumulative or complementary existing technologies.¹⁵ The result is often a “thicket” of too many highly fragmented and yet overlapping patent rights belonging to too many different entities, all of whom have the same rights to block all of the others from combining their respective technologies into a single, marketable whole. This in turn decreases commercialization and development of these technologies, to the detriment of not only the patent owners but also the public.¹⁶

Furthermore, the issue of overprotection under the existing patent system relates to the more general problem of low-quality patents.¹⁷ Low-quality patents are those that cover technological developments requiring little to no R&D investment, often yielding negligible social or technological value.¹⁸ Note that this Article refers to the “value” or “quality” of an invention as defined by its social or technological value, not its economic value. The economic value of an invention is greatly

12. See Schuster et al., *supra* note 8.

13. BURK & LEMLEY, *supra* note 5, at 204 n.1.

14. See Maayan Perel, *Reviving the Gatekeeping Function: Optimizing the Exclusion Potential of Subject Matter Eligibility*, 23 ALB. L.J. SCI. & TECH. 237, 287–88 (2013).

15. BURK & LEMLEY, *supra* note 5, at 78.

16. See Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, 1 INNOVATION POL’Y & ECON. 119, 121–22 (2000).

17. See generally R. Polk Wagner, *Understanding Patent-Quality Mechanisms*, 157 U. PA. L. REV. 2135, 2140–41 (2009) (discussing the problems created by low patent quality).

18. See *Graham v. John Deere Co.*, 383 U.S. 1, 5–6 (1966) (noting that patent system was not designed to protect innovations that contribute little to the art); Bronwyn H. Hall & Dietmar Harhoff, *Post-Grant Reviews in the U.S. Patent System-Design Choices and Expected Impact*, 19 BERKELEY TECH. L.J. 989, 991 (2004) (“[H]igh quality patents describe inventions that are truly new, rather than inventions that are already in widespread use but not yet patented.”).

influenced by any patent rights attached to it, but patent rights are exactly the variable that this Article proposes to alter. Some low-quality patents are issued by mistake, but many are simply a result of the inability of the current patent system to screen out inventions that do not need or merit full patent protections.¹⁹ For example, many scholars have suggested that low-quality patents are particularly common among business-method and software patents, both areas in which patent quality is hotly debated.²⁰ Because low-quality patents offer the same level of protection as high-quality patents under the current system, however, patent owners have the power to interfere with the innovative activity of others, even when they themselves made little to no scientific contribution.²¹ Low-quality and low-value patents also create problems by giving leverage to “patent trolls,”²² who generate revenues not through invention or commercialization but through aggressive patent litigation and licensing techniques to extract rents from those who do.²³ Such practices serve only to divert investment from R&D and thus obstruct rather than stimulate innovation and technological progress.²⁴ The overabundance of low-quality and low-value patents and their concomitant problems with rights coordination and patent trolling have led to what many term a “patent crisis” or “patent failure,”²⁵ with significant costs for patentees, innovation, and society at large.²⁶

In a two-tiered patent regime, however, many of these low-investment, low-value inventions could be channeled into unregistered protections. At first glance, this might seem to accomplish little, but the virtue of unregistered patent rights is they could provide an alternative in terms of both duration and rights provided. The authors of this Article have previously proposed one such alternative: unregistered patent rights that, while relying on the same patentability requirements as registered rights,

19. See Wagner, *supra* note 17, at 2141.

20. See BESSEN & MEURER, *supra* note 4, at 187–214 (discussing software and business method patents).

21. *Id.* at 159–60.

22. See generally John R. Allison, Mark A. Lemley & David L. Schwartz, *How Often Do Non-Practicing Entities Win Patent Suits?*, 32 BERKELEY TECH. L.J. 237, 242–44 (2017) (discussing patent trolling); Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117, 2146–66 (2013) (same).

23. See Lemley & Melamed, *supra* note 22, at 2163–65. *But see* David L. Schwartz & Jay P. Kesan, *Analyzing the Role of Non-Practicing Entities in the Patent System*, 99 CORNELL L. REV. 425, 444 (2014) (suggesting that nonpracticing entities may support markets for patent rights).

24. See Wagner, *supra* note 17, at 2140–41.

25. BESSEN & MEURER, *supra* note 4, at 2–24; BURK & LEMLEY, *supra* note 5, at 1.

26. See BESSEN & MEURER, *supra* note 4, at 46–72, 147–64; BURK & LEMLEY, *supra* note 5, at 3–6.

last for only three years. More importantly, such rights would provide the right to exclude others from making, using, selling, or offering to sell only direct copies of the protected invention, not independent creations.²⁷ In this way, unregistered patent rights would not only set a meaningful limit on those that have not been vetted through the examination process but also permit some rough tailoring of patent protections. Because unregistered rights like these would be considerably limited in both duration and reach, they are significantly less burdensome on others than the much fuller and longer protections offered under registered rights. To the extent that inventors of minimally inventive or low-value works can be encouraged to settle for unregistered rights rather than registered ones, then, it would reduce the overall patent load in cumulative or complementary technologies and thus ease patent thickets and other problems in coordinating rights.

In a minority of cases, inventors would voluntarily forgo the much greater protections of registered rights for the much less costly protections of unregistered ones. For example, unregistered patent rights may be particularly attractive in technologies that have fast development cycles and high obsolescence rates, such as computer software and some electronics. In these fields, the profitable life of new innovations is brief and often gone before the examination process for registered patent rights can be completed. Unregistered patent rights, by contrast, would attach automatically, without cost or delay, and provide more meaningful protections for such short-lived innovations. Unregistered patent protections could be attractive for low-investment and low-value inventions as well, where three years of immediate albeit limited protections would easily be sufficient to recoup R&D costs as well as some profit, particularly in light of the fact that the protections come at no cost. But, as is evident from the crisis seen under the current patent system, many would still find it in their interests to invest in obtaining full registered rights in hopes of extracting more rents through aggressive licensing or litigation. To relieve the glut of this latter type of low-quality and low-value patenting, the patent system would need other, more aggressive measures to encourage owners of such inventions to choose unregistered rights over registered ones.

This Article therefore proposes a number of “sticks” that could be used to push inventors to choose unregistered rights over registered ones when their R&D investments do not meet some minimum threshold level. These sticks include higher filing fees, terminal disclaimers of some part of their

27. Miriam Marcowitz-Bitton, Yotam Kaplan & Emily Michiko Morris, *Unregistered Patents & Gender Equality*, 43 HARV. J.L. & GENDER 47, 73–88 (2020).

patent terms, or even disqualification from patent eligibility. Similar measures also could be imposed on nonpracticing patent owners who do not license their patents in good faith.

The analysis here advances the bold idea of introducing unregistered patents as a way to mitigate the ills of the current patent system, whose one-size-fits-all approach often results in either overprotection or underprotection by providing the same level of protection without regard to the great differences in the levels of investment that different inventions require. While the authors recognize the value of registering patent rights and do not call for the abolition of the current regime, the establishment of an unregistered patent regime would offset some of the drawbacks of registration. The automatic grant of limited patent rights without the need for registration would bypass bias during the registration process and reduce other inequities affecting access to patent protection. Such a scheme would also provide a more appropriate level of protection to low-value and low-investment inventions. Therefore, the patent system must consider the role of unregistered patent rights and incorporate their use in tandem with registered patent rights.

The Article proceeds as follows. Part I provides a brief overview of the two-tiered regimes in copyright and trademarks, which unlike patent law offer both registered and unregistered routes of protection. This Part also discusses the justifications for registering IP rights. Part II then examines the current patent crisis on the one hand and the inequities and possible distributive effects arising from patent registration regimes, on the other hand, highlighting the various gender, racial, ethnic, and socio-economic gaps in patent protection. While the academic literature on registration of IP rights consistently focuses on its economic benefits, the patent regime's one-size-fits-all approach introduces significant costs by incentivizing the filing of patent applications on low-value and low-investment inventions, thereby raising the overall cost of innovation. Moreover, the inequities that arise from the registration process have long been overlooked in patent rights, and these costs create significant drags on equitable access to protection.

Part III introduces a proposal to mitigate both of these negative effects through the introduction of an unregistered patent regime. While registration should not be disincentivized, introduction of unregistered patents could offer a useful route to handling many of the negative side effects of the patent system. Although the rights granted under the proposed unregistered patent regime would be much less robust than those under the existing registered patent system, the unregistered patent rights would at least provide some measure of protection for inventors who are disadvantaged by the existing registration system. By the same token, the

carefully constrained design of the proposed unregistered rights could also reduce the power of rights holders who are arguably overly advantaged by the existing one-size-fits-all registered patent regime, particularly when combined with measures to drive these rights holders toward unregistered rights. In other words, the proposed model could mitigate the proliferation of patent rights on low-value, low-investment inventions by channeling these inventions toward narrower, much shorter-lived unregistered patents.

I. REGISTERED AND UNREGISTERED IP REGIMES

People have asserted and protected property rights under the law long before systems to register those rights existed. Even now, registration is not necessary to protect many types of property and other rights. For example, one need not register rights in every piece of personal property one owns. Nevertheless, registration of rights, particularly property rights, has become common.

Comparing the effect of registration in securing rights to the grant of rights without registration is particularly apropos in the field of IP rights, where protection is often granted both with and without registration. Both copyright and trademark law in the United States employ such a two-tiered approach: protection is automatic for all works that meet the requisite criteria, but protection can also be secured through registration.²⁸ A notable exception to this pattern is patent law, which does not employ a two-tiered approach and mandates registration and examination in order to receive protection.²⁹ Examining the theory behind registration of IP rights, as well as how specifically registration is used in each type of IP, shows that registration is heavily favored. Even in two-tiered regimes like copyright and trademark, registration yields advantages that unregistered rights do not. This disparity in protection between registered and unregistered rights thus has obvious implications, as discussed in Part II.

A. *The Theory Behind Registration*

The benefits of registration clearly demonstrate why copyright, trademark, and patent law all employ a registered rights approach. Registration serves an important public-notice function providing all with

28. Industrial design protection in the European Union and other jurisdictions also employs the two-tiered registered and unregistered rights approach. This Article, however, focuses solely on U.S. law.

29. 35 U.S.C. § 111 (discussing patent application); *id.* §§ 131–135 (discussing patent examination).

information on who owns what rights.³⁰ This saves both rights owners and potential infringers the costs of having to communicate with each other about the boundaries of those rights, which in turn lowers both enforcement and clearance costs.³¹ Registration also enhances the marketability of IP rights by verifying for buyers both the nature of the asset at issue and the seller's claim of ownership of it, thus reducing transaction costs.³² Registration furthermore enables sellers to transfer only partial rights, such as security interests or leaseholds, by allowing them to designate ownership without regard to physical possession.³³ Owners who register their assets also can more easily prove their ownership rights against fraudulent third-party claims of ownership and identify, locate, and recover assets that have been stolen, lost, or poorly transferred.³⁴

In addition, registration systems that require substantive examination, such as patent law, provide assurances that the rights granted are warranted and valid. This may increase the value of the rights by signaling not only legitimacy of the rights themselves but also that of their owner. Registration and examination also can help settle conflicting claims by giving priority to the first to register, the first to use, the first to create or possess, and so on, while simultaneously giving everyone else notice not to waste resources on reproducing what has already been claimed. The registration and examination process can elicit disclosures of information that might otherwise be kept as trade secrets.³⁵ These disclosures also assist in cross-sectional and longitudinal studies on rights registered and who owns them.³⁶ Failure to register one's IP rights, on the other hand, can be interpreted as dedication to the public or abandonment, thus reducing the number of ownership claims. Registration fees and other costs likewise can help deter claims to low-value creations or other assets.

30. Douglas Baird & Thomas Jackson, *Information, Uncertainty, and the Transfer of Property*, 13 J. LEGAL STUD. 299, 303–04 (1984).

31. *Id.*

32. Benito Arruñada, *Registries*, 1 MAN & ECON. 209, 211 (2014); Abraham Bell & Gideon Parchomovsky, *Of Property and Information*, 116 COLUM. L. REV. 237, 241–42 (2016).

33. Baird & Jackson, *supra* note 30, at 304–05.

34. Bell & Parchomovsky, *supra* note 32, at 241–42.

35. Indeed, in the patent system rights are said to be based on a “patent bargain” quid pro quo—full disclosure of technical information in exchange for property rights—as a way of enhancing the public's fund of technological and scientific knowledge. See 35 U.S.C. §§ 111–114 (discussing the patent application disclosure requirements).

36. See, for example, Schuster et al., *supra* note 8, and Robert Brauneis & Dotan Oliar, *An Empirical Study of the Race, Ethnicity, Gender, and Age of Copyright Registrants*, 86 GEO. WASH. L. REV. 46 (2018), for two major studies on trademark and copyright registration, respectively. Much of the value of this data also can be seen below in the discussion on the distributive effects of patent registration.

Intellectual property, which involves creations that are not only new but also intangible, particularly benefits from registration. The general lack of physically visible boundaries makes registration an important means of providing public notice of the claimed property right. Trademark, copyright, and patent law all employ registration to varying degrees, however.

B. *Trademark*

Trademark law employs a two-tiered approach by offering both registered and unregistered rights but varying the protections provided, particularly with regard to available remedies for infringement. Trademark law protects words, logos, package designs, and combinations thereof that are used by a manufacturer or merchant to identify its goods or services and distinguish them from others.³⁷ Trademarks thus include brand names,³⁸ service marks,³⁹ certification marks,⁴⁰ and collective marks.⁴¹ Owners can claim rights over their marks by registering them with the United States Patent and Trademark Office (USPTO), but simply being the first to use a sufficiently distinctive mark “in commerce” on or in connection with goods or services allows the user to acquire rights automatically within the geographic area of use, even if someone else subsequently tries to register rights in the same mark.⁴²

Registration nonetheless offers a number of advantages.⁴³ Federal registration provides protection nationwide, regardless of how extensively

37. 15 U.S.C. § 1127; *see also* Kellogg Co. v. Nat’l Biscuit Co., 305 U.S. 111, 118–19 (1938); RESTATEMENT (THIRD) OF UNFAIR COMPETITION § 9 (AM. L. INST. 1995).

38. 15 U.S.C. § 1127; *Coca-Cola Co. v. Koke Co. of Am.*, 254 U.S. 143, 145–46 (1920).

39. 15 U.S.C. § 1127 (service marks are “any word, name, symbol, or device, or any combination thereof . . . used by a person . . . to identify and distinguish the services of one person, including a unique service, from the services of others and to indicate the source of the services, even if that source is unknown”).

40. *Id.* (certification marks are “any word, name, symbol, or device, or any combination thereof . . . used by a person . . . to certify regional or other origin, material, mode of manufacture, quality, accuracy, or other characteristics of such person’s goods or services or that the work or labor on the goods or services was performed by members of a union or other organization”).

41. *Id.* (collective marks are marks “used by the members of a cooperative, an association, or other collective group or organization . . . and includes marks indicating membership in a union, an association, or other organization”); *see also* Procter & Gamble Co. v. Johnson & Johnson, Inc., 485 F. Supp. 1185 (S.D.N.Y. 1979), *aff’d*, 636 F.2d 1203 (2d Cir. 1980).

42. *See* Nat’l Ass’n for Healthcare Commc’ns, Inc. v. Cent. Ark. Area Agency on Aging, Inc., 257 F.3d 732, 735 (8th Cir. 2001); *Planetary Motion, Inc. v. Techsplosion, Inc.*, 261 F.3d 1188, 1193–200 (11th Cir. 2001); *see also* 15 U.S.C. § 1127 (defining “use in commerce”).

43. BARTON BEEBE, TRADEMARK LAW 250–52 (7th ed. 2020); *see also* 15 U.S.C. §§ 1057, 1065, 1072 (enumerating benefits of registration).

the mark is actually being used.⁴⁴ Mark owners can also register their marks with individual states, but this protects the mark only within that particular state⁴⁵ and can be superseded by subsequent federal registration.⁴⁶ Moreover, remedies such as disgorgement of profits,⁴⁷ damages for past infringement,⁴⁸ litigation costs,⁴⁹ and attorneys' fees are limited to federally registered marks⁵⁰ whose infringers had actual notice of the federal registration.⁵¹

Otherwise, both registered and unregistered trademarks enjoy the same protections. Protections for both last as long as the marks continue to meet the requisite standards for use in commerce and distinctiveness,⁵² although owners of federally registered marks also must take some additional steps, such as periodically certifying that continued use.⁵³ Both registered and unregistered marks can be licensed⁵⁴ or assigned⁵⁵ under specific circumstances, and federal and state trademark law protect both registered and unregistered marks⁵⁶ against infringement by identical or confusingly similar marks on identical or closely related goods or services within the protected geographical area.⁵⁷ Both registered and unregistered marks enjoy the right to injunctive relief against future infringement under federal and most state laws,⁵⁸ although this relief is limited. Some states even have criminal penalties for certain forms of

44. 15 U.S.C. §§ 1072, 1057(c).

45. See 3 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 22:1 (5th ed. 2020).

46. *Id.* § 22:2 (“[I]f state law were to give a state registrant exclusive rights throughout a state, such a result could be preempted by the federal Lanham Act, which limits the non-registrant to the exact territory of continuous pre-registration usage.”).

47. 15 U.S.C. § 1117(b).

48. *Id.*; *Taco Cabana Int’l, Inc. v. Two Pesos, Inc.*, 932 F.2d 1113, 1125–27 (5th Cir. 1991), *aff’d*, 505 U.S. 763 (1992). Damages for past infringement can also be trebled in cases of willful infringement. 15 U.S.C. § 1117(b).

49. 15 U.S.C. § 1114.

50. *Id.*; *Sands, Taylor & Wood v. Quaker Oats Co.*, 34 F.3d 1340, 1347 (7th Cir. 1994).

51. 15 U.S.C. § 1111.

52. *Id.* § 1064; *Saratoga Vichy Spring Co. v. Lehman*, 625 F.2d 1037, 1043 (2d Cir. 1980).

53. 15 U.S.C. §§ 1058–1059.

54. *Id.* § 1127; *Clark & Freeman Corp. v. Heartland Co.*, 811 F. Supp. 137, 139–40 (S.D.N.Y. 1993).

55. 15 U.S.C. § 1060; see *Yocum v. Covington*, 216 U.S.P.Q. (BNA) 210, 212–13 (T.T.A.B. 1982).

56. 15 U.S.C. § 1125.

57. *Id.*; *Polaroid Corp. v. Polarad Elecs. Corp.*, 287 F.2d 492, 495 (2d Cir. 1961), *cert. denied*, 368 U.S. 820 (1961).

58. 15 U.S.C. § 53; *Church of Scientology Int’l v. Elmira Mission of the Church of Scientology*, 794 F.2d 38, 41 (2d Cir. 1986).

trademark infringement.⁵⁹

The rationale behind trademark's two-tiered system is unclear. Trademark-like indications have been used for centuries.⁶⁰ In medieval England, for example, professional guilds and even some towns adopted symbols that artisans were required to use on their goods to show that they met established quality standards.⁶¹ Protection and regulation of these symbols were highly decentralized and variable, and whether the symbols had to be registered with a particular authority depended on the guild, locality, or town at issue.⁶² Much later, after trademarks came to be seen less as regulatory marks and more as protectible designations of origin, nineteenth century English and American courts interpreted this medieval history as showing that trademarks were protectible as common-law rights.⁶³ As trademarks continued to grow in value, national registries were established to provide more certainty over the ownership and geographic scope of rights.⁶⁴ State courts in the U.S. continued to protect trademarks as common-law rights, however, with federal courts eventually following suit,⁶⁵ presumably to protect settled expectations. Trademark law nonetheless created an increasing number of advantages to registration, such as nationwide priority, to incentivize registration.⁶⁶ The benefits of continuing to protect unregistered trademark rights, on the other hand, have gone unremarked.

C. Copyright

Although many other countries employ only a single-tiered, unregistered-rights-only approach to copyright protection, copyright law

59. See Jeremy M. Wilson, Brandon A. Sullivan, Travis Johnson, Roy Fenoff & Kari Kammel, *Product Counterfeiting Legislation in the United States: A Review and Assessment of Characteristics, Remedies, and Penalties*, 106 J. CRIM. L. & CRIMINOLOGY 521, 543–60 (2016).

60. FRANK L. SCHECHTER, *THE HISTORICAL FOUNDATIONS OF THE LAW RELATING TO TRADE-MARKS* 19–20 (Munroe Smith et al. eds., 1925).

61. *Id.* at 42–63 (describing English practices starting in the fourteenth century).

62. *Id.*

63. *Id.* at 9–10, 123–24, 152–53; David E. Missirian, *The Death of Moral Freedom: How the Trademark Dilution Act Has Allowed Federal Courts to Punish Subjectively-Defined Immoral Secondary Use of Trademarks*, 18 CHI.-KENT J. INTELL. PROP. 396, 398 (2019).

64. SCHECHTER, *supra* note 60, at 134 (noting how registration increased with increase of importance of trademarks); 10 CONG. REC. H2799 (daily ed. Apr. 27, 1880) (statement of H. Rep. M.A. McCoid); CONG. GLOBE, 41st Cong., 2nd Sess. 4821 (1870) (Senate voting against striking proposal in House bill to allow registration of trademark rights).

65. J. Thomas McCarthy, *Lanham Act § 43(a): The Sleeping Giant Is Now Wide Awake*, 59 LAW & CONTEMP. PROBS. 45, 51–54 (1996).

66. Deborah R. Gerhardt & Jon P. McClanahan, *Do Trademark Lawyers Matter?*, 16 STAN. TECH. L. REV. 583, 587 (2013).

in the U.S. and several other countries employs a two-tiered approach of both registered and unregistered protection of works, similar to that in trademark law.⁶⁷ Copyrights are said to protect the “writings” of “authors,”⁶⁸ but this actually includes written works, pictorial and sculptural works, audiovisual works, sound recordings, computer programs, and even architectural works.⁶⁹ Copyright covers only the particular expression of ideas, not the ideas themselves,⁷⁰ but otherwise the standards are simple: a work need only be “original” and fixed in a tangible medium to be protectable.⁷¹ Moreover, protection is quite long-lived: works created on or after January 1, 1978, for example, are protected for the remainder of the authors’ lifetimes plus another seventy years.⁷²

Despite the availability of registration, the vast majority of works are unregistered. The moment a (minimally) original work is fixed in a tangible form, it automatically enjoys federal copyright protection.⁷³ No copyright notice is required,⁷⁴ although owners may affix a statutory copyright notice to all publicly distributed copies of their works.⁷⁵ Protection automatically grants the exclusive right to reproduce, distribute, publicly display and perform, and make derivatives from their works, and for some fine artworks, authors also have the right to

67. There is an ongoing debate over the merits of automatic ownership rights to one’s own expressive works versus the merits of public registration of such rights, however. See LAWRENCE LESSIG, *FREE CULTURE: HOW BIG MEDIA USES TECHNOLOGY AND THE LAW TO LOCK DOWN CULTURE AND CONTROL CREATIVITY* 287–91 (2004); Stef van Gompel, *Formalities in the Digital Era: An Obstacle or Opportunity?*, in *GLOBAL COPYRIGHT: THREE HUNDRED YEARS SINCE THE STATUTE OF ANNE, FROM 1709 TO CYBERSPACE* 398–99 (L. Bently et al. eds., 2010); Niva Elkin-Koren, *Can Formalities Save the Public Domain? Reconsidering Formalities for the 2010s*, 28 *BERKELEY TECH. L.J.* 1537, 1538–41 (2013); James Gibson, *Once and Future Copyright*, 81 *NOTRE DAME L. REV.* 167, 168–73 (2005); Pamela Samuelson, *Preliminary Thoughts on Copyright Reform*, 2007 *UTAH L. REV.* 551, 562–63; Christopher Sprigman, *Reform(aliz)ing Copyright*, 57 *STAN. L. REV.* 485, 486–91 (2004); Daniel Gervais & Dashiell Renaud, *The Future of United States Copyright Formalities: Why We Should Prioritize Recordation, and How to Do It*, 28 *BERKELEY TECH. L.J.* 1459, 1460–66 (2013).

68. U.S. CONST. art. I, § 8, cl. 8; Zechariah Chafee, Jr., *Reflections on the Law of Copyright: I*, 45 *COLUM. L. REV.* 503, 506–11 (1945); William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright Law*, 18 *J. LEGAL STUD.* 325, 325–33, 344–46 (1989).

69. 17 U.S.C. § 102(a).

70. *Id.* § 102(b); *Baker v. Selden*, 101 U.S. 99, 100 (1879).

71. 17 U.S.C. § 102(a); *Feist Publ’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991); BENJAMIN KAPLAN, *AN UNHURRIED VIEW OF COPYRIGHT* 45–46 (1967).

72. 17 U.S.C. § 302; H.R. REP. NO. 94-1476, at 133–36 (1976).

73. 17 U.S.C. § 102(a); H.R. REP. NO. 94-1476, at 52–53.

74. 17 U.S.C. § 401(a).

75. *Id.* § 401.

attribution or modification.⁷⁶ Copyright protections are, in many ways, narrower than in trademark or patent law, however. Independent creation is an absolute defense to claims of infringement, and actual copying is often difficult to prove.⁷⁷ Federal law in the U.S. also contains many detailed safe harbors, such as “fair use” of a work for “transformative” purposes such as criticism, comment, news reporting, teaching, scholarship, and research.⁷⁸

That being said, the U.S. did not grant unregistered, automatic protections until 1978,⁷⁹ and even now, unregistered works receive less protection than registered ones. For example, registration creates a presumption of validity of the copyright on a work⁸⁰ and is thus a prerequisite for initiating infringement suits for works of U.S. origin.⁸¹ Current law also allows statutory damages and attorneys’ fees only for infringement occurring after registration⁸² and bars non-willful infringement defenses for marked works.⁸³ Likewise, recordation of transfers creates a presumption of constructive notice but is not a prerequisite to an infringement action or a limit on infringement damages.⁸⁴ The division between registered and unregistered copyright rights thus resembles that seen in trademark law.

The history of copyright protections is slightly more complex than that of trademark protections. Although rights to print a work in Elizabethan England had to be registered with a printing guild, authors’ rights to their works often were contended to arise under common law and last into perpetuity without the need for registration.⁸⁵ Thus, as with trademark

76. *Id.* §§ 106, 106A.

77. *See, e.g.,* Ringgold v. Black Ent. Television, Inc., 126 F.3d 70, 74–75 (2d Cir. 1997) (explaining plaintiffs’ frequent need to rely on similarity plus access as indirect proof of copying); Alan Latman, “*Probative Similarity*” as Proof of Copying: Toward Dispelling Some Myths in Copyright Infringement, 90 COLUM. L. REV. 1187, 1188–99 (1990) (same).

78. 17 U.S.C. § 107; *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 579 (1994).

79. Copyright Act of 1976, 17 U.S.C. § 408; *see* Berne Convention for the Protection of Literary and Artistic Works art. 5(2), Sept. 9, 1886, amended Sept. 28, 1979, 25 U.S.T. 1341, 1161 U.N.T.S. 3 [hereinafter *Berne Convention for the Protection of Literary and Artistic Works*].

80. 17 U.S.C. § 410(c).

81. *Id.* § 411. There is no registration prerequisite in order to bring suit for infringement of a work of foreign origin. *See U.S. Adherence to the Berne Convention Hearings Before the Subcomm. on Patents, Copyrights, & Trademarks of the Comm. on the Judiciary*, 99th Cong. 480–81 (1987).

82. 17 U.S.C. § 412.

83. *See id.* § 401(d).

84. *Id.* § 205(c). The law continues to require deposit but punishes failure to comply with a fine rather than with forfeiture of the copyright. *Id.* § 407(d).

85. Tyler T. Ochoa & Mark Rose, *The Anti-Monopoly Origins of the Patent and Copyright Clause*, 84 J. PAT. & TRADEMARK OFF. SOC’Y 909, 916–17 (2002) (discussing *Millar v. Taylor* (1769) 98 Eng. Rep. 201 (KB)).

rights, copyrights were originally protected without registration. Copyright registration was created only later to record the content and date of a protectable work and to limit what otherwise would have been a perpetual common-law monopoly over the protected work.⁸⁶

United States federal law introduced such unregistered rights into its own copyright regime only after 1978 when it had finally acceded to the Berne Convention for the Protection of Literary and Artistic Works (Berne Convention).⁸⁷ Before 1978, U.S. federal copyright protection required publication with notice, deposit of a copy of the work with the register of copyright, and registration,⁸⁸ but both the Berne Convention and the Agreement on Trade-Related Aspects of Intellectual Property (TRIPS Agreement)⁸⁹ now prohibit the U.S. and other signatory countries from imposing formalities as a condition for protection.⁹⁰ Indeed, the Berne Convention developed over several decades not only to enhance copyright protections but also to make them more uniformly and easily obtainable, especially for foreign authors or others who might not be fully aware of a particular country's domestic copyright provisions.⁹¹ This reflects the natural rights philosophy that authors should have the right to control their creative works without having to comply with burdensome formalities in every country in which they wanted to protect their works.⁹²

Unlike the copyright laws in many other countries, the Copyright Act of 1976⁹³ retained registration in the U.S. This time, registration was retained on a voluntary basis in order to continue building the Library of Congress's collection of protected works and to provide it with as

86. Deborah R. Gerhardt, *Copyright Publication: An Empirical Study*, 87 NOTRE DAME L. REV. 135, 141–42 (2011).

87. Berne Convention for the Protection of Literary and Artistic Works, *supra* note 79; *see also* 2 DAVID NIMMER, NIMMER ON COPYRIGHT § 7.02[B] (2020) (detailing development of the 1976 Act); Agreement on Trade-Related Aspects of Intellectual Property Rights art. 9, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299 [hereinafter Agreement on Trade-Related Aspects of Intellectual Property Rights] (incorporating Articles 1 through 21 of the Berne Convention).

88. *See* Copyright Act of 1909, ch. 320, §§ 9–12, 35 Stat. 1075, 1080, *repealed by* Copyright Act of 1976, 17 U.S.C. §§ 407–412.

89. Agreement on Trade-Related Aspects of Intellectual Property Rights, *supra* note 87, at art. 9.

90. NIMMER, *supra* note 87, § 7.02[B].

91. *See* Jane C. Ginsburg, “With Untired Spirits and Formal Constancy”: Berne Compatibility of Formal Declaratory Measures to Enhance Copyright Title-Searching, 28 BERKELEY TECH. L.J. 1583, 1588–91 (2013).

92. Robert C. Hauhart, *Natural Law Basis for the Copyright Doctrine of Droit Moral*, 30 CATH. LAW. 53, 62 (1985) (“Subsequent national and international charters and declarations have continued to ground their existence in natural law and natural rights concepts. Among these, one may find the Berne Convention and its doctrine of moral rights of authors.” (footnote omitted)).

93. 17 U.S.C. §§ 101–1401.

comprehensive a record as possible of protected works.⁹⁴ The former is achieved through mandatory deposits of published works with the Library,⁹⁵ and the latter is incentivized by granting enhanced protections for registered works.⁹⁶

The merits of copyright formalities generally and registration specifically have been much debated. Complying with formalities is expensive, particularly when dealing with more than one jurisdiction, but forgoing registration increases clearance costs for others trying to determine whether a work is copyrighted and the identity of the rights holder.⁹⁷ These costs in turn hinder licensing of protected works and free use of unprotected works.⁹⁸ Information technology has served to exacerbate rather than ameliorate the problem by significantly increasing the number of copyrightable works.⁹⁹

The rise in clearance costs has led some scholars and policy advocates to call for the reintroduction of formalities,¹⁰⁰ particularly copyright registration,¹⁰¹ especially given that information technology can now reduce the cost of complying with such formalities.¹⁰² Some also argue that formalities can help enable reuse of cultural works and facilitate access to content.¹⁰³ Other scholars also argue that compliance with formalities should be even more strongly incentivized,¹⁰⁴ including for downstream transferees,¹⁰⁵ especially during the final twenty years, which are not mandated by the TRIPS Agreement, the major international treaty on IP.¹⁰⁶ Nonetheless, formalities continue to impose costs on copyright owners in a way that unregistered rights do not.

94. *Id.* §§ 407–412.

95. *Id.* § 407.

96. *Id.* §§ 408, 502–505, 510.

97. Stef van Gompel, *Copyright Formalities in the Internet Age: Filters of Protection or Facilitators of Licensing*, 28 BERKELEY TECH. L.J. 1425, 1431–34 (2013).

98. *Id.* at 1433.

99. See Sprigman, *supra* note 67, at 526–27.

100. See LESSIG, *supra* note 67, at 287–91; Gibson, *supra* note 67, at 221–29; Samuelson, *supra* note 67, at 562–63; van Gompel, *supra* note 67, at 395–423.

101. See Sprigman, *supra* note 67, at 488 n.13.

102. See Michael W. Carroll, *A Realist Approach to Copyright Law's Formalities*, 28 BERKELEY TECH. L.J. 1511, 1525–32 (2013).

103. Elkin-Koren, *supra* note 67, at 1563.

104. See, e.g., Christopher Jon Sprigman, *Berne's Vanishing Ban on Formalities*, 28 BERKELEY TECH. L.J. 1565, 1565–70 (2013) (advocating “new style” formalities to address the degree of protection, not whether a work is protected or not).

105. See Ginsburg, *supra* note 91, at 1614–15; see also Gervais & Renaud, *supra* note 67, at 1492–93.

106. Maria A. Pallante, *The Curious Case of Copyright Formalities*, 28 BERKELEY TECH. L.J. 1415, 1419 (2013).

D. Patent

Unlike copyright and trademark law, patent law protects an invention only through registration and examination by a patent office.¹⁰⁷ All three types of patent protections available in the U.S.—“utility patents” for new and useful processes, machines, articles of manufacture, and compositions of matter,¹⁰⁸ “design patents” for new ornamental designs for articles of manufacture,¹⁰⁹ and “plant patents” for new cultivated varieties of asexually reproducing plants—require registration.¹¹⁰ Of these, the most well-known are utility patents, which the USPTO examines under the various rigorous standards for patentability: subject matter eligibility,¹¹¹ novelty,¹¹² nonobviousness,¹¹³ and utility.¹¹⁴

For inventions that meet these exacting standards, protection is relatively brief but robust. Utility patents last for twenty years from the date of filing, as long as periodic maintenance fees are paid,¹¹⁵ and can even be extended under special circumstances.¹¹⁶ During that term, patents grant the right to exclude all others from making, using, selling, or offering an invention for sale, regardless of independent invention or even awareness of the patentee’s rights.¹¹⁷ Process patents also provide the exclusive right to import, use, or sell products made from the process in the U.S.¹¹⁸ Infringement can be remedied through injunctive relief¹¹⁹ and damages of not less than a reasonable royalty,¹²⁰ which may be trebled,¹²¹ although failure to mark the invention with the word “patent”

107. See generally 35 U.S.C. § 102; BURK & LEMLEY, *supra* note 5, at 7–20.

108. 35 U.S.C. § 101; BURK & LEMLEY, *supra* note 5, at 8–9.

109. 35 U.S.C. § 171; BURK & LEMLEY, *supra* note 5, at 8–9 (describing design patents as “cover[ing] nonfunctional product designs.”).

110. 35 U.S.C. § 161; BURK & LEMLEY, *supra* note 5, at 8–9.

111. 35 U.S.C. § 101; BURK & LEMLEY, *supra* note 5, at 9.

112. 35 U.S.C. § 102; BURK & LEMLEY, *supra* note 5, at 9.

113. 35 U.S.C. § 103; BURK & LEMLEY, *supra* note 5, at 9.

114. 35 U.S.C. § 101; BURK & LEMLEY, *supra* note 5, at 9. Other countries vary somewhat in their patentability criteria, although centralized filing procedures are available under the Patent Cooperation Treaty, June 19, 1970, 28 U.S.T. 7645, 1160 U.N.T.S. 231 (entered into force Apr. 1, 2002) (allowing unified patent filing in member states), and the Convention on the Grant of European Patents, Oct. 5, 1973, 1065 U.N.T.S. 199 (allowing unified patent filing in EU member states).

115. 35 U.S.C. § 154(a)(2).

116. *Id.* § 154(b).

117. *Id.* § 154(a)(1).

118. *Id.*

119. *Id.* § 283.

120. *Id.* § 284.

121. *Id.*

or “pat.” and the patent number¹²² does preclude a patentee from obtaining infringement damages, unless the patentee can prove that the infringer otherwise had notice of the patent.¹²³

Patent systems thus provide no automatic, unregistered alternative, although trade secrecy under federal or state law can provide such rights for inventions that are kept secret¹²⁴ through reasonable measures to maintain that secrecy.¹²⁵ Trade secrecy protects against only “wrongful” or “improper” acquisition or use of the secret,¹²⁶ however, and provides no protection against independent creation or even innocent copying.¹²⁷

Patent law’s adamantly single-tiered approach may stem in large part from the idea that registration and examination are necessary to limit the potentially monopolistic effects that patents can create.¹²⁸ Useful inventive concepts may be more rare than copyrightable expression or protectable trademarks, and defenses to infringement such as fair or experimental use or even independent creation do not exist in patent law, making patents particularly powerful.¹²⁹ Technology is typically both cumulative, in that it builds upon itself, as well as complementary, in that it is used in conjunction with other technologies. As such, patent rights frequently create “anticommons,” in which the transaction costs of coordinating rights held by diverse owners with diverse interests and motivations ultimately prohibit productive use of those rights.¹³⁰ Both registration and rigorous examination to ensure that a patent is in fact warranted can help limit these effects.

Thus, although copyright and trademark law offer both registered and unregistered rights, patent law has never done so, taking instead a registered-only approach that offers the same unitary term of protection regardless of merit or value. Part II will discuss in greater detail the largely unacknowledged costs that this one-size-fits-all registered patent regime imposes. First is the overprotection of marginal inventions that require

122. *Id.* § 287.

123. *Id.*

124. Defend Trade Secrets Act, 18 U.S.C. §§ 1831–1839; RESTATEMENT (THIRD) OF UNFAIR COMPETITION § 39 (AM. L. INST. 1995) (“A trade secret is any information that can be used in the operation of a business or other enterprise and that is sufficiently valuable and secret to afford an actual or potential economic advantage over others.”).

125. See Robert G. Bone, *A New Look at Trade Secret Law: Doctrine in Search of Justification*, 86 CALIF. L. REV. 241, 247–48 (1998).

126. *Id.*; see also 18 U.S.C. § 1839.

127. See 18 U.S.C. § 1839(5) (defining “misappropriation” as copying or disclosing a trade secret through “improper means”).

128. See Marcowitz-Bitton et al., *supra* note 27, at 77–88.

129. *Id.* at 78–80; Marcowitz-Bitton & Michiko Morris, *supra* note 9, at 327.

130. BURK & LEMLEY, *supra* note 5, at 75–77.

little or no investment but also yield little or no value and in fact may yield negative value by obstructing technological development and use.¹³¹ Second is the distributive effects that the resource-intensive patent registration and examination system has on certain inventors, particularly women and minorities, whose inventions often are underprotected because they are deterred from obtaining patents.¹³²

II. THE EXISTING REGIME, THE PATENT CRISIS AND THE DISTRIBUTIVE EFFECTS OF PATENT REGISTRATION

A. *The Existing Regime and the Patent Crisis*

The patent system is designed to incentivize innovation.¹³³ Patents provide a bundle of exclusive rights that allow their owners to try to reap economic benefit from their inventions.¹³⁴ Patent protection therefore is thought to advance human knowledge, science, and technology.¹³⁵ Yet, the social gain of enhanced innovation comes with a price. Exclusive ownership of an invention can have monopolistic effects and result in inflation of the prices of goods sold under a patent.¹³⁶ Patent law seeks to resolve this cost-benefit tension by limiting the duration of exclusivity.¹³⁷ The current system applies a one-size-fits-all approach, according the same twenty-year period of protection to all inventions irrespective of their value.¹³⁸ In addition to this time limitation, patent law provides statutory and doctrinal safeguards against potential imbalances in the costs vis-à-vis benefits of patents, such as specified requirements for patentability and the availability of compulsory licensing in special circumstances of social need.¹³⁹ However, inventions that meet the statutory patentability requirements of subject matter eligibility,¹⁴⁰

131. Marcowitz-Bitton et al., *supra* note 27, at 80.

132. *See generally* Schuster et al., *supra* note 8.

133. *See* U.S. CONST. art. I, § 8, cl. 8.

134. *See* 35 U.S.C. § 271(a) (providing rights of exclusivity); Cotropia, *supra* note 3, at 168–71 (noting the incentive effects of these rights); Lemley, *supra* note 3, at 129–30.

135. *See* BURK & LEMLEY, *supra* note 5, at 8.

136. *Id.* at 68, 71.

137. 35 U.S.C. § 154(a)(2).

138. *See* Abraham Bell & Gideon Parchomovsky, *Reinventing Copyright and Patent*, 113 MICH. L. REV. 231, 233–34 (2014).

139. 35 U.S.C. § 101; Gianna Julian-Arnold, *International Compulsory Licensing: The Rationales and the Reality*, 33 IDEA: J.L. & TECH. 349, 349–55 (1993).

140. 35 U.S.C. § 101.

utility,¹⁴¹ novelty,¹⁴² and non-obviousness¹⁴³ all receive the same potentially monopolistic level of protection. All patentees have the exclusive rights to use, sell, offer for sale, and import patented inventions¹⁴⁴ for the same, unitary twenty-year period of protection. Affording all inventors identical rights of exclusivity under this one-size-fits-all paradigm, however, without taking into account the cost of the invention or its economic and social value, creates several problems.

First, the current system undermines the constitutional mandate on which it is based. Article 1, Section 8 of the United States Constitution establishes that “Congress shall have power To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”¹⁴⁵ The current one-size-fits-all system, however, protects low-investment inventions to the same extent that it protects inventions requiring much more significant investments, thus providing unnecessary incentives for innovations that quite possibly would have occurred anyway. More specifically, if an invention can be created at a low cost, or at virtually no cost at all, no patent incentive is required in order “to promote” the creation of the invention.¹⁴⁶ As Professor Maayan Perel has noted, the current system often issues “patents whose development is not dependent on the patent act’s pecuniary incentives.”¹⁴⁷

Similarly, many commentators argue that even under patent law’s currently rigorous application and examination scheme, too many low-quality patents are clogging up the system and weighing down technological progress.¹⁴⁸ Scholars like Professors Fagundes and Masur, for example, argue that patents are much more likely to cover inventions that are of low social value than copyrights are to cover expressive works of low value.¹⁴⁹ This is because the costs of ensuring that inventions truly

141. *Id.*

142. *Id.* § 102.

143. *Id.* § 103.

144. *Id.* § 154(a)(1).

145. U.S. CONST. art. I, § 8, cl. 8.

146. See Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U. PA. L. REV. 1, 13–14 (2005).

147. See Perel, *supra* note 14, at 282–88.

148. See Christopher A. Cotropia, *The Folly of Early Filing in Patent Law*, 61 HASTINGS L.J. 65, 69–71 (2009).

149. David Fagundes & Jonathan S. Masur, *Costly Intellectual Property*, 65 VAND. L. REV. 677, 679, 726–28 (2012). That being said, Fagundes and Masur do not specify how they measure social value for either patented or copyrighted creations and instead seem to rely on the idea that inventions of low economic value necessarily lead to patents of low social value. See, e.g., *id.* at 686 n.21, 687

meet the patentability requirements are prohibitively high for the USPTO.¹⁵⁰ Because low-quality inventions typically contribute very little to the “Progress of . . . useful Arts,” a constitutional mandate incentivizing the creation of such inventions would seem likewise to be reduced.¹⁵¹

Second, the current patent system grants the same level of protection to both high- and low-investment patents.¹⁵² This results in an imbalance between the ex post costs of short-term monopolistic rights and the ex ante benefits of higher incentives for innovation.¹⁵³ The decreased competition and increased costs associated with a patent monopoly thus exceed the social benefits derived from such innovations.¹⁵⁴

To appreciate this point, consider the costs imposed by the current system. Patents can inflict deadweight losses on society because patentees may be able to sell their inventions at higher, monopolistic prices.¹⁵⁵ Users whose benefits from using a patented invention would be greater than its competitive price nonetheless will forgo using the invention if it is instead sold at a higher monopolistic price. This causes a loss of not only the profit the patentee would have earned had they sold their invention at its competitive price but also the value of the utility users would have received from using the patented invention had its price been lower.¹⁵⁶ Such forgone transactions thus result in deadweight losses equal to the combined surplus the parties would have received in a competitive market.¹⁵⁷ Under a freely competitive regime, by contrast, inventors tend

(stating that “[a] patent with low private value will have low social value, but a patent with low social value will not necessarily have low private value” because patentees can still profit from patents on “low social value” inventions by threatening and thereby extorting fees from others (citing Jonathan S. Masur, *Costly Screens and Patent Examination*, 2 J. LEGAL ANALYSIS 687 (2010))).

150. See F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. REV. 55, 58–59 (2003); Mark A. Lemley, *Rational Ignorance at the Patent Office*, 85 NW. U. L. REV. 1495, 1497–500 (2001).

151. U.S. CONST. art. I, § 8, cl. 8; see also *Graham v. John Deere Co.*, 383 U.S. 1, 5–6 (1966) (“The Congress in the exercise of the patent power may not overreach the restraints imposed by the stated constitutional purpose. Nor may it enlarge the patent monopoly without regard to the innovation, advancement or social benefit gained thereby.”).

152. Perel, *supra* note 14, at 282.

153. *Id.*

154. See David S. Olson, *Taking the Utilitarian Basis for Patent Law Seriously: The Case for Restricting Patentable Subject Matter*, 82 TEMP. L. REV. 181, 186, 193–94 (2009).

155. See WILLIAM A. MCEACHERN, *ECONOMICS: A CONTEMPORARY INTRODUCTION* 204–05 (10th ed. 2014).

156. See Steve P. Calandrillo, *An Economic Analysis of Property Rights in Information: Justifications and Problems of Exclusive Rights, Incentives to Generate Information, and the Alternative of a Government-Run Reward System*, 9 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 301, 304 (1998).

157. MASSIMO MOTTA, *COMPETITION POLICY: THEORY AND PRACTICE* 41–42 (2004).

to sell their inventions at lower prices closer to their marginal cost of production, which for low-investment inventions may still yield sufficient net revenues to incentivize what little investment was necessary to bring the inventions to the public.¹⁵⁸

Of course, costs imposed by the patent system may be justified if they help promote innovation. This is because innovations such as patentable inventions share the characteristics of so-called public goods. A public good is defined by two fundamental characteristics: (1) nonrivalrousness, which means that consumption by one person does not leave less for any other consumer, and (2) nonexcludability, which is the high cost or, often, impossibility of excluding nonpaying beneficiaries from consuming the good.¹⁵⁹ Without the possibility of recouping the costs of producing such a good by extracting payment from consumers, no private profit-maximizing firm would have the incentive to supply it.¹⁶⁰ For creations such as inventions, the incentives to create and produce an invention or its resulting goods suffer from the relative ease of copying and the inability of innovators to recapture the sunk costs of creation by extracting payment.¹⁶¹ This problem thus must be solved either through subsidies or through supracompetitive pricing.¹⁶² The patent system employs the latter strategy by guaranteeing the exclusivity necessary for supracompetitive pricing and the possibility to recoup the fixed cost of invention.¹⁶³ It is in this way that the patent system seeks to “promote the Progress of . . . useful Arts.”¹⁶⁴

To justify the grant of patent rights, however, the deadweight loss occasioned by such supracompetitive pricing must be outweighed by the social benefit of incentives to innovate.¹⁶⁵ With low-investment inventions, this balancing equation seems to collapse.¹⁶⁶ When the process of inventing depends on relatively low monetary expenses, inventors are less dependent on the pecuniary incentive of a right to exclude others from

158. See Calandrillo, *supra* note 156, at 304–05.

159. Parchomovsky & Wagner, *supra* note 146, at 13.

160. See Wendy J. Gordon, *Asymmetric Market Failure and Prisoner’s Dilemma in Intellectual Property*, 17 U. DAYTON L. REV. 853, 854–59 (1992) (identifying this as market failure); Wendy J. Gordon, *On Owning Information: Intellectual Property and the Restitutory Impulse*, 78 VA. L. REV. 149, 223–24, 230–38 (1992).

161. Olson, *supra* note 154, at 196.

162. See ROBERT COOTER & THOMAS ULEN, *LAW & ECONOMICS* 108 (Denise Clinton et al. eds., 5th ed. 2008).

163. See SUZANNE SCOTCHMER, *INNOVATION AND INCENTIVES* 36–37 (2004).

164. U.S. CONST. art. I, § 8, cl. 8.

165. See Louis Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, 97 HARV. L. REV. 1813, 1824–25 (1984).

166. Perel, *supra* note 14, at 287–88.

their inventions.¹⁶⁷ With no substantial need to recoup their costs of invention, inventors will invent so long as they expect their inventions to make at least minimal profit.¹⁶⁸

Thanks to the exclusivity ensured by patent protection, however, patentees of low-investment inventions may be able to sell copies of their inventions for several times their marginal costs of production, regardless of whether the patentees actually need to earn such supracompetitive returns.¹⁶⁹ Thus, because the current one-size-fits-all system of patent protection does not align the costs of investment or value of an invention with the length or breadth of patent protection, low-investment inventions impose deadweight losses without countervailing societal benefit.¹⁷⁰ If the cost of creating an invention is low enough that its inventor needed little to no return on it, there is no need for the patent system to force society to pay a higher monopolistic price for it. The social benefit of patenting thus would be outweighed by the deadweight losses it causes. The fact that society pays equally to promote all inventions, regardless of their respective investments, introduces inefficiency.

Third, the current one-size-fits-all patent system distorts the incentive structure of the patent system. As noted above, the current system frequently makes low-investment but patentable inventions much more profitable than high-investment inventions. If identical protection and potentially similar earning opportunities compensate for smaller and larger investments in R&D alike, inventors will rationally minimize their investments and skew their efforts toward low-investment inventions.¹⁷¹ Indeed, this tendency will be even more marked if the low-investment patents cover inventions needed for complementary or cumulative technologies. In this case the low-investment patents could also be used to extract licensing or other rents from other inventors, making the system more vulnerable to abuse.¹⁷² Moreover, because the current one-size-fits-all system of patent protection does not take into account the magnitude of investments in invention, inventors are also effectively incentivized to minimize their overall research investments, thereby increasing the odds

167. See Alan Devlin & Neel Sukhatme, *Self-Realizing Inventions and the Utilitarian Foundation of Patent Law*, 51 WM. & MARY L. REV. 897, 898, 921, 951 (2009).

168. See *id.* at 927–28.

169. See Bell & Parchomovsky, *supra* note 138, at 240. This does not include “pirate” companies that simply elect to ignore patents and take their chances in court, hoping that they can avoid infringement or invalidate the patent. Mark A. Lemley, *Ignoring Patents*, 2008 MICH. ST. L. REV. 19, 21–22.

170. Calandrillo, *supra* note 156, at 327–28.

171. See Bell & Parchomovsky, *supra* note 138, at 239–40.

172. See Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1992–93 (2007).

that they will produce low-quality inventions, in turn reducing social welfare.¹⁷³

Fourth, the current one-size-fits-all approach creates a drag on innovation by others. Allowing patent owners to obtain licensing revenues greatly exceeding their investment in their patents could hamper the ability of downstream innovators to commercialize and benefit from their own innovations.¹⁷⁴ Patentees can demand such excess rents through holdups and threats of patent litigation.¹⁷⁵ Defendants who have already sunk large investments into developing and commercializing products that now appear to infringe those patents will be highly motivated to pay whatever royalties or licensing fees are demanded of them.¹⁷⁶ Otherwise, the defendants may have to stop developing and commercializing their products if the patents at issue are found to be valid and infringed.¹⁷⁷ As the rich literature on patent holdups and patent trolls explains, agreeing to pay excessive licensing fees is not a genuine exercise of free will, but a coerced last resort.¹⁷⁸ By generating income through aggressive licensing and litigation instead of commercialization, patent trolls ultimately hinder subsequent innovation at great cost to social welfare. If, on the other hand, patentees received protection that more closely resembled their actual investment in their patents, improper injunctive threats and strategic holdups could be drastically reduced.¹⁷⁹

Fifth, the proliferation of patents leads to holdouts, patent thickets, patent trolling, and other phenomena that overdeter other inventors from working on worthwhile projects for fear of infringing another's patents.¹⁸⁰ This is in some part due to the fact that technology may also be more incremental, cumulative, or complementary than expressive works, trademarks, or trade secrets,¹⁸¹ and inventive concepts are often more

173. See 2 JOHN W. SCHLICHER, *PATENT LAW, LEGAL AND ECONOMIC PRINCIPLES* § 13:31 (2d ed. 2015). But see Janet Freilich, *Prophetic Patents*, 53 U.C. DAVIS L. REV. 663, 716–17 (2019) (explaining why inventors might be better off investing in research in order to create working examples of their invention rather than filing early with a prophetic example of the invention).

174. See Lemley & Shapiro, *supra* note 172, at 2009–10.

175. *Id.* at 1992–93.

176. *Id.*

177. See Mark A. Lemley, *Ten Things to Do About Patent Holdup of Standards (and One Not to)*, 48 B.C. L. REV. 149, 153–54 (2007).

178. See Lemley & Shapiro, *supra* note 172, at 1993; Michael J. Meurer, *Controlling Opportunistic and Anti-Competitive Intellectual Property Litigation*, 44 B.C. L. REV. 509, 541–43 (2003).

179. Meurer, *supra* note 178, at 541–43.

180. Robert G. Harris, *Patent Assertion Entities & Privateers: Economic Harms to Innovation and Competition*, 59 ANTITRUST BULL. 281 *passim* (2014).

181. See, e.g., John Shepard Wiley Jr., *Copyright at the School of Patent*, 58 U. CHI. L. REV. 119, 146, 167, 182 (1991) (arguing that authorship is much less incremental than invention).

difficult to design around.¹⁸² Unlike other IP rights, moreover, patent law has very few safe harbors from infringement to protect inventors from opportunistic claims of infringement and from overdetering others from using and building on existing technologies.¹⁸³ For instance, both copyright and trade secrecy allow independent creation as a complete defense to infringement,¹⁸⁴ but this defense does not apply to patent infringement, which is a strict liability offense that does not require that the alleged infringer even know that the invention was patented.¹⁸⁵ Patent law also lacks the fair-use defense, which in copyright and trademark law allows others to copy protected marks or expression for uses such as commentary, satire, etc.¹⁸⁶ The few safety valves that patent law does possess are very narrow and seldom applicable. Prior-user right exceptions to patent infringement are common in a number of countries but apply only to those who were using an invention, often only if in a commercial setting, before another independent creator filed an application to patent that invention.¹⁸⁷ Likewise, many countries allow experimental-use exceptions to patent infringement, but the only commercial uses allowed are for the clinical trials needed for regulatory approval of generic pharmaceuticals.¹⁸⁸ A few other more specific exceptions exist, such as the U.S. patent system's section 287(c)

182. See Fagundes & Masur, *supra* note 149, at 712–14.

183. Some scholars doubt the effectiveness of such safety valves in buffering against the negative effects of IP rights on others, however, see Sprigman, *supra* note 67, at 526–27.

184. See *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991); *Procter & Gamble Co. v. Colgate-Palmolive Co.*, 199 F.3d 74, 77–78 (2d Cir. 1999). Trademark law does not allow an independent creation defense, however, see *Blendco, Inc. v. Conagra Foods, Inc.*, 132 F. App'x 520, 523 (5th Cir. 2005).

185. *Commil USA, LLC v. Cisco Sys., Inc.*, ___ U.S. ___, 135 S. Ct. 1920, 1926 (2015); *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 490 (1974).

186. Gideon Parchomovsky & Alex Stein, *Intellectual Property Defenses*, 113 COLUM. L. REV. 1483, 1505 (2013) (explaining that fair use allows descriptive use of another's trademark); Elizabeth L. Rosenblatt, *Intellectual Property's Negative Space: Beyond the Utilitarian*, 40 FLA. ST. U. L. REV. 441, 452 (2013) (describing fair use as “use-based carve-outs” from copyright infringement liability). Copyright law in the U.S. also contains a number of compulsory licenses, and other countries do avail themselves of compulsory licensing of patents as well, as allowed under the TRIPS agreement. See generally David N. Makous & Mina I. Hamilton, *Compulsory IP Licensing and Standards-Setting, Standard-Essential Patents and F/RAND*, in *INTELLECTUAL PROPERTY LICENSING STRATEGIES* 95 (Thomson Reuters & Aspatore, 2014 ed.). In the U.S., however, rights holders have thus far successfully resisted compulsory licensing of trade secrets, trademarks, and patents. *Id.*

187. U.S. PAT. & TRADEMARK OFF., REPORT ON PRIOR USER RIGHTS 2–3, https://www.uspto.gov/sites/default/files/ip/global/prior_user_rights.pdf [<https://perma.cc/WA2X-33WJ>] (report drafted by DK, DE, FR, UK).

188. See generally Hans-Rainer Jaenichen & Johann Pitz, *Research Exemption/Experimental Use in the European Union: Patents Do Not Block the Progress of Science*, COLD SPRING HARBOR PERSPS. MED., 2015, at 1 (describing the status of the experimental-use exception in EU member states).

exemption from damages for infringement of patents on “medical activit[ies]” by “medical practitioner[s]” and “related health care entit[ies]” but these exceptions are even more constrained.¹⁸⁹ This paucity of defenses to patent infringement, combined with the costs and uncertainty of infringement litigation, causes inventors to often give patents a much wider berth than they merit.¹⁹⁰ Patents are therefore more likely than other types of IP rights to overdeter others.

The anticommons dynamic prevalent in the current system is a notable example of how too many patents can stifle innovation.¹⁹¹ Anticommons result from overfragmentation of property rights¹⁹² that distribute the right to exclude into the hands of too many owners.¹⁹³ This often occurs in the patent context when several different patents cover complementary elements of a product or different steps in a cumulative innovative process.¹⁹⁴ The heightened transaction costs and potential for holdouts that result from an anticommons easily lead to bargaining breakdowns whenever the development of a product requires permission from the owners of two or more elements or steps.¹⁹⁵ One example of the anticommons problem is DNA sequence patents,¹⁹⁶ of which hundreds cover specific genes or gene fragments.¹⁹⁷ The current one-size-fits-all patent system exacerbates the anticommons problem by allowing the

189. 35 U.S.C. § 287(c); see also Cynthia M. Ho, *Patents, Patients, and Public Policy: An Incomplete Intersection at 35 U.S.C. § 287(c)*, 33 U.C. DAVIS L. REV. 601, 641–45 (2000).

190. See Bert I. Huang, *Surprisingly Punitive Damages*, 100 VA. L. REV. 1027, 1046–47 (2014) (discussing in *terrorem* effects of copyright law); see also Christopher R. Leslie, *The Anticompetitive Effects of Unenforced Invalid Patents*, 91 MINN. L. REV. 101, 117–18 (2006) (discussing in *terrorem* effects of patents).

191. See BURK & LEMLEY, *supra* note 5, at 75–77; Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621, 624 (1998).

192. See Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCI. 698, 698–99 (1998); Arti K. Rai, *The Information Revolution Reaches Pharmaceuticals: Balancing Innovation Incentives, Cost, and Access in the Post-Genomics Era*, 2001 U. ILL. L. REV. 173, 192–94.

193. BURK & LEMLEY, *supra* note 5, at 76.

194. *Id.*

195. See *id.*; Rochelle Cooper Dreyfuss, *Varying the Course in Patenting Genetic Material: A Counter-Proposal to Richard Epstein’s Steady Course*, in PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT 195, 197–98 (F. Scott Kieff ed., 2003); Lloyd Cohen, *Holdouts and Free Riders*, 20 J. LEGAL STUD. 351, 356 (1991). See generally MANCUR OLSON, *THE LOGIC OF COLLECTIVE ACTION* (1961) (describing the problems of collective action).

196. See BURK & LEMLEY, *supra* note 5, at 86; cf. Dan L. Burk, *Introduction: A Biotechnology Primer*, 55 U. PITT. L. REV. 611, 621–28 (1994).

197. See Rebecca S. Eisenberg, *Reaching Through the Genome*, in PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT 209, 210–11 (F. Scott Kieff ed., 2003); S. M. Thomas, A. R. W. Davies, N. J. Birtwistle, S. M. Crowther & J. F. Burke, *Commentary, Ownership of the Human Genome*, 380 NATURE 387, 387–88 (1996).

proliferation of multiple low-investment and low-quality patents.

This proliferation of low-investment and low-quality patents also implicates the closely related issue of patent thickets. Patent thickets are distinguished from anticommons by the overlapping nature of the patents involved, such that practicing even a single patent out of the thicket could necessarily entail infringement of others.¹⁹⁸ Anticommons are thus a problem of coordinating large numbers of patents, while patent thickets are a problem of coordinating overlaps between patents. The current patent system fosters such thickets by permitting separate inventors to patent small, cumulative contributions to the same product.¹⁹⁹ As these overlapping patents accumulate, it becomes nearly impossible to pierce the patent thicket and secure the necessary consent for continued innovation.²⁰⁰ Patent thickets are also created when patent offices err in the examination and vetting process, inadvertently granting overlapping patents to several inventors.²⁰¹ In the current patent system, such mistakes are a by-product of both the low quality of patents and their high numbers, which overwhelm the capacity of patent offices to sift through them all carefully.

The one-size-fits-all approach of the existing patent system thus can be seen as the root of many instances in which patents overprotect inventions and overdistribute the rights to those protections amongst inventors. The result is to hinder, rather than promote, technological progress, a direct contradiction of the very purpose of the patent system. An alternative form of patent protection that offers a better match to the actual investment in and value of many inventions would help mitigate this perverse effect of the current system.

B. Distributive Effects of Patent Registries

Despite the thickets, trolls, and anticommons that plague the modern-day patent system, that same system also underprotects many inventors. A variety of factors contribute to the gender, race, and other demographic and economic gaps seen amongst patent holders, but the current registration and examination regime is one significant factor that contributes to these distributive effects in ways that have been long overlooked, despite the large body of social science and legal scholarship

198. See BURK & LEMLEY, *supra* note 5, at 77–78, 89–92; Shapiro, *supra* note 16, at 121.

199. See BURK & LEMLEY, *supra* note 5, at 90.

200. *Id.* at 78.

201. *Id.* (suggesting that “[b]ecause patent examiners spend very little time with each patent, patents regularly issue that would not withstand more searching scrutiny, and indeed nearly half of all litigated patents are held invalid”).

on the subject.²⁰² Similar distributive effects are seen in other areas of IP, but these effects are most marked in patent rights.²⁰³

1. *Distributive Effects on Women, Racial Minorities, and Entrepreneurs*

For example, a large number of studies, including a comprehensive 2016 World Intellectual Property Organization (WIPO) study of international patent application patterns, have shown a sizeable gender gap in applications for, grants, and ownership of patents. In the WIPO study, for example, fewer than 30% of international patent applications listed any female inventors, and less than 5% listed only female inventors.²⁰⁴ Women in academia also hold fewer patents, even in fields such as bioscience, where female academics are more numerous,²⁰⁵ and women generally patent less often than they publish.²⁰⁶

Moreover, although patents by women are thought to be equal to or better in quality and impact than those by men,²⁰⁷ other research shows patent applications from women were more likely to be rejected.²⁰⁸ Patent applications by female inventors, for example, are 21% more likely to be

202. See Anjali Vats & Deidre A. Keller, *Critical Race IP*, 36 CARDOZO ARTS & ENT. L.J. 735, 752–55 (2018).

203. Robert Brauneis & Dotan Oliar, *An Empirical Study of the Race, Ethnicity, Gender, and Age of Copyright Registrants*, 86 GEO. WASH. L. REV. 46 (2018) (studying racial, ethnic, gender and age gaps in copyright registration). No empirical work to date has documented gaps in trademark registration for extended periods. See NAT'L WOMEN'S BUS. COUNCIL, INTELLECTUAL PROPERTY AND WOMEN ENTREPRENEURS 46 (2012), <https://cdn.www.nwbc.gov/wp-content/uploads/2018/02/27192725/Qualitative-Analysis-Intellectual-Property-Women-Entrepreneurs-Part-1.pdf> [<https://perma.cc/H2CQ-FCFD>] (documenting the gender gap in trademark filing and registration and concluding “[w]omen have a significantly higher participation in Trademark activity as compared to Patent activity”).

204. Martinez et al., *supra* note 7, at 8; see also U.K. INTELL. PROP. OFF., GENDER PROFILES IN WORLDWIDE PATENTING: AN ANALYSIS OF FEMALE INVENTORSHIP 30 (2016), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/567518/Gender-profiles-in-worldwide-patenting.pdf [<https://perma.cc/D9M2-58QX>].

205. Annette I. Kahler, *Examining Exclusion in Woman-Inventor Patenting: A Comparison of Educational Trends and Patent Data in the Era of Computer Engineer Barbie*, 19 AM. U. J. GENDER SOC. POL'Y & L. 773, 776–77 (2011).

206. Rainer Frietsch, Inna Haller, Melanie Funken-Vrohllings & Hariolf Grupp, *Gender-Specific Patterns in Patenting and Publishing*, 38 RSCH. POL'Y 590, 595 (2009).

207. G. Steven McMillan, *Gender Differences in Patenting Activity: An Examination of the U.S. Biotechnology Industry*, 80 SCIENTOMETRICS 683, 683 (2009); Kjersten Bunker Whittington & Laurel Smith-Doerr, *Gender and Commercial Science: Women's Patenting in the Life Sciences*, 30 J. TECH. TRANSFER, 355, 363–66 (2005).

208. Jensen et al., *supra* note 11, at 307.

rejected by the USPTO than those by men.²⁰⁹ The USPTO also tends to grant fewer claims in women's applications and to narrow those claims that they did allow in scope and value more than those in men's applications.²¹⁰

Studies on IP law and gender have revealed other ways in which the law and how it is applied also contribute to gender disparities in IP rights, including patents.²¹¹ For example, the seemingly gender-neutral but vague "PHOSITA" (Person Having Ordinary Skill In The Art) standard for measuring utility and nonobviousness is often interpreted and applied in gender-biased ways.²¹² Likewise, patentable subject matter doctrine relies on frequently androcentric definitions of "invention," "technology," and "industrial application" that exclude the types of social or otherwise nonmechanical inventions that women often create.²¹³ Empirical data also suggest gender biases among patent examiners, who are more likely to reject part or all of applications from inventors whose first names are widely recognized as feminine.²¹⁴

Women also have difficulty in even accessing the patent system. The patenting process can cost as much as tens of thousands of dollars per patent,²¹⁵ but women tend to have fewer financial resources, such as access to venture capital and other funding.²¹⁶ Women also have less access to the kinds of networking and other support structures that can help negotiate the complexities of patent drafting, filing, and

209. *Id.* In other words, applications filed by women are more likely to be rejected regardless of the field of technology or science to which the invention belongs. When the researchers controlled for technology class, the rejection rate fell to 7%, as women were more likely to apply for patents in technology classes with lower acceptance rates. *Id.*

210. *Id.* at 308.

211. Kara W. Swanson, *Intellectual Property and Gender: Reflections on Accomplishments and Methodology*, 24 AM. U. J. GENDER SOC. POL'Y & L. 175, 176 (2015).

212. Dan L. Burk, *Diversity Levers*, 23 DUKE J. GENDER L. & POL'Y 25, 34–42 (2015); Dan L. Burk, *Do Patents Have Gender?*, 19 AM. U. J. GENDER SOC. POL'Y & L. 881, 883–907 (2011).

213. Shlomit Yanisky-Ravid, *Eligible Patent Matter—Gender Analysis of Patent Law: International and Comparative Perspectives*, 19 AM. U. J. GENDER, SOC. POL'Y & L. 851, 851 (2011).

214. Jensen et al., *supra* note 11, at 309.

215. *USPTO Fee Schedule*, U.S. PAT. & TRADEMARK OFF. [hereinafter *USPTO Fee Schedule*], <https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule#Patent%20Fees> [https://perma.cc/UKK5-V5RN] (listing the fee schedule effective October 2, 2020).

216. ALICIA ROBB, U.S. SMALL BUS. ADMIN., OFF. OF ADVOC., ACCESS TO CAPITAL AMONG YOUNG FIRMS, MINORITY-OWNED FIRMS, WOMEN-OWNED FIRMS, AND HIGH-TECH FIRMS 31 (2013), [https://www.sba.gov/sites/default/files/files/rs403tot\(2\).pdf](https://www.sba.gov/sites/default/files/files/rs403tot(2).pdf) [https://perma.cc/L3L6-WK65]; Paula E. Stephan & Asmaa El-Ganainy, *The Entrepreneurial Puzzle: Explaining the Gender Gap*, 32 J. TECH. TRANSFER 475, 483–86 (2007).

prosecution.²¹⁷ And of course, outright sexism amongst colleagues, industry, and even customers has a deleterious effect on female inventors, often causing them to misjudge the patentability and importance of their own work.²¹⁸

The resulting gender gap in patent ownership has consequences for women who want to commercialize their innovations. Patents not only protect against free-riding on investments in inventing and commercializing those inventions²¹⁹ but also help to signal technological expertise and innovative legitimacy to potential investors and cross-licensing partners.²²⁰ Likewise, patent applications and patents help attract investment funding from sources such as venture capitalists.²²¹ Patents even serve an important role in deterring infringement lawsuits by others by furnishing meaningful grounds for countersuit.²²² The inability to obtain patent protections thus has obvious economic implications for women.

By contrast, racial and ethnic gaps in patenting have not been as well studied as the gender gap in patenting, although a few legal scholars have explored the intersection of patenting and race over various periods in time. Historically, African Americans could not own patents because they were not considered “citizens” of the United States.²²³ Of course, this also meant that those who held African Americans as enslaved peoples also could not patent the inventions created by these people either, as neither the enslaved inventor nor the purported owner had standing to make the required inventor’s oath.²²⁴ These deeply racist laws were later abrogated

217. See Wenpin Tsai & Sumantra Ghoshal, *Social Capital and Value Creation: The Role of Intrafirm Networks*, 41 ACAD. MGMT. J. 464, 473 (1998); MILLI ET AL., *supra* note 6, at 22–26.

218. NAT’L WOMEN’S BUS. COUNCIL, *supra* note 203, at 15–17; Fiona Murray & Leigh Graham, *Buying Science and Selling Science: Gender Differences in the Market for Commercial Science*, 16 INDUS. & CORP. CHANGE 657, 667–69 (2007); Christine Wenneras & Agnes Wold, Commentary, *Nepotism and Sexism in Peer-Review*, 387 NATURE 341, 341 (1997).

219. MILLI ET AL., *supra* note 6, at 16; Michael Abramowicz & John F. Duffy, *Intellectual Property for Market Experimentation*, 83 N.Y.U. L. REV. 337, 338–45 (2008); Landes & Posner, *supra* note 68, at 328–33. *But see* Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 343–47 (2010) (questioning whether the current patent system provides adequate protection for commercialization investments).

220. Stuart J. H. Graham, Robert P. Merges, Pam Samuelson & Ted Sichelman, *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255, 1287–309 (2009).

221. MILLI ET AL., *supra* note 6, at 15–16.

222. Ted Sichelman & Stuart J. H. Graham, *Patenting by Entrepreneurs: An Empirical Study*, 17 MICH. TELECOMMS. & TECH. L. REV. 111, 124–25 (2010).

223. *Dred Scott v. Sandford*, 60 U.S. (19 How.) 393, 396 (1857), *superseded by constitutional amendment*, U.S. CONST. amend. XIV.

224. *Invention of a Slave*, 9 Op. Att’y Gen. 171, 171–72 (1858); Brian L. Frye, *Invention of a Slave*, 68 SYRACUSE L. REV. 181, 181, 188 (2018).

by the Thirteenth Amendment, but the historical exclusion of African Americans from the U.S. patent system continued long afterward.²²⁵

For example, Cook and Kongcharoen²²⁶ examined patenting patterns among women and African American inventors as identified by their first names, and identified only a little over 1,000 African American inventors from an initial pool of approximately 1.2 million U.S. inventor names (0.00083%).²²⁷ Another study of the 2003 National Survey of College Graduates dataset²²⁸ revealed that Hispanic and Black inventors are among the least likely to file patent applications, particularly among male inventors.²²⁹ The study also showed that the USPTO was less likely to grant applications by either female inventors or Black and Hispanic inventors.²³⁰ A recent study by Schuster et al. confirms these results and clearly shows that minority inventors in the U.S. are less likely to secure patents compared to white male inventors.²³¹ The distributive effects of the patent registration system thus may affect racial minorities as well as women.

One surprising third group of inventors on whom the current patent registration system imposes distributive effects are entrepreneurs. Entrepreneurs, who by definition take on greater financial risks in starting and operating their businesses, contribute significantly to economic growth globally and in the U.S.²³² Because of the inherent risk, entrepreneurs also rely heavily on IP protections, which often affect the opportunities for and the success or failure of entrepreneurial endeavors.²³³ Recent research on American entrepreneurs suggests that the patent system disadvantages entrepreneurs, however, by discouraging them from seeking patent protection.²³⁴

225. Frye, *supra* note 224, at 223–29.

226. Lisa D. Cook & Chaleampong Kongcharoen, *The Idea Gap in Pink and Black* (Nat'l Bureau of Econ. Rsch., Working Paper No. 16331, 2010), <https://www.nber.org/papers/w16331.pdf> [<https://perma.cc/DEE6-36FP>].

227. *Id.* at 41.

228. MILLI ET AL., *supra* note 6, at 5.

229. *Id.*

230. *Id.* at 6; *see also* Schuster et al., *supra* note 8, at 306.

231. Schuster et al., *supra* note 8, at 303.

232. *See* DAVID B. AUDRETSCH, MAX C. KEILBACH & ERIK E. LEHMANN, *ENTREPRENEURSHIP AND ECONOMIC GROWTH* 7 (1st ed. 2006) (noting that entrepreneurs are more willing to take risks); JOSEPH A. SCHUMPETER, *THE THEORY OF ECONOMIC DEVELOPMENT: AN INQUIRY INTO PROFITS, CAPITAL, CREDIT, INTEREST, AND THE BUSINESS CYCLE* 74–79 (1934) (discussing entrepreneurship generally); Martin A. Carree & A. Roy Thurik, *The Impact of Entrepreneurship on Economic Growth*, in *HANDBOOK OF ENTREPRENEURSHIP RESEARCH* 437 (Zoltan J. Acs & David B. Audretsch eds., 2003) (examining the relationship between economic growth and entrepreneurship).

233. *See* Sichelman, *supra* note 222, at 114–15.

234. Graham et al., *supra* note 220, at 1309–15.

Of most relevance to the discussion here, among the many reasons they cited for not pursuing patents, entrepreneurs pointed to the cost of obtaining a patent, including attorneys' fees, and the cost of enforcing the patent, including litigation, as two of the leading factors.²³⁵ Interestingly, start-ups' reasons to forgo patenting differed by industry: software companies, whose invention development cycles tend to be rapid and brief, cited patent prosecution costs as the reason for abstaining from patenting, while biotechnology companies, whose invention development cycles are frequently slow and uncertain, cited a reluctance to disclose information as the reason.²³⁶ These results are similar to those found in the Small Business Administration survey of small firms conducted in 1998²³⁷ and the findings reported in the Carnegie Mellon study.²³⁸

Patent reform initiatives have tried to address the cost concern by introducing lower filing and maintenance fees for small entities. "Small entities" of 500 or fewer employees, as well as universities and non-profit organizations, can qualify for a 50% reduction in fees.²³⁹ The America Invents Act (AIA) also allows "micro entities," defined as small entities with gross earnings of no more than three times the median household income in the past year and who are not assigned to an entity with greater earnings, a 75% fee discount.²⁴⁰ While these fee reductions are important and helpful for small business interests, they do nothing to mitigate attorneys' fees, which comprise the more significant patenting costs.²⁴¹

While some argue that patent registration and examination do not disenfranchise as many inventors as a similar screening system would do under copyright law,²⁴² in reality, a significant number of inventors are disenfranchised by the costs and complexities of the patent registration and examination system as well as its inherent biases.²⁴³ Importantly, that disenfranchisement falls systematically and disproportionately on women

235. *Id.* at 1309–12.

236. *Id.* at 1312–14.

237. JOSEPH J. CORDES, HENRY R. HERTZFELD & NICHOLAS S. VONORTAS, U.S. SMALL BUS. ADMIN., A SURVEY OF HIGH TECHNOLOGY FIRMS 55–58 (1999), www.sba.gov/advo/research/rs189tot.pdf [<https://perma.cc/9MYW-M82H>].

238. Wesley M. Cohen, Richard R. Nelson & John P. Walsh., *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)* 15–16 (Nat'l Bureau of Econ. Rsch., Working Paper No. 7552, 2000).

239. *USPTO Fee Schedule*, *supra* note 215; *see also* 37 C.F.R. § 1.27 (2019) (defining "small entity").

240. Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 10, 125 Stat. 284, 316–19 (2011). Micro entities also cannot have been named in more than four previous patent applications. *Id.*

241. *See* Graham et al., *supra* note 220, at 1311.

242. Wiley, *supra* note 181, at 182–83 (noting that authors greatly outnumber inventors).

243. MILLI ET AL., *supra* note 6, at 18–28.

and people of color in particular.²⁴⁴

2. *The Characteristics of Patent Registration*

Many factors contribute to the underrepresentation of women, minorities, and entrepreneurs, but patent registration is undoubtedly a significant factor. Three specific but long overlooked characteristics of the patent registration system are to blame: the costs of obtaining and maintaining registered patent rights; the dependence of registration on human judgement and the natural human predilection toward bias; and the need to understand the intricacies of the registration as well as the value of the rights it yields.

As compared to the much lower costs of obtaining copyrights or trademarks, the patenting process is quite complex and resource intensive. Even for inventors who are aware that their inventions might be patentable, determining whether an invention is patentable is inherently difficult because the standards for protection are much stricter than those in copyright, trademark, or trade secrecy. Before applying for a patent, inventors must conduct patent searches to verify whether their inventions meet the standards for patentability over existing technologies.²⁴⁵ Because the information costs of identifying and analyzing all relevant prior art can be considerable, patent searches alone range from \$165 to \$660.²⁴⁶

If the patent search indicates that a patent is worth pursuing, inventors can apply for a “provisional” patent application to give themselves up to a year to explore whether to invest further,²⁴⁷ but the fee for filing a provisional patent adds another \$75 to \$300 in costs.²⁴⁸ As noted above, the mandatory filing fees for nonprovisional applications vary with filing entity and the complexity of the invention and range from a few hundred dollars to more than two thousand. Surcharges for late submission, extension of time, accelerated examination, and other special requests can also increase the cost of patent filing by thousands of dollars.²⁴⁹

In addition, many patent applicants seek assistance from patent agents or patent attorneys during the application process. The complexity and rigor of the patenting process can take years, with an average pendency of

244. Kanze et al., *supra* note 6, at 588–89; MILLIET AL., *supra* note 6, at 5–6, 18–28; Martinez et al., *supra* note 7, at 1–4.

245. *Patent Process Overview*, U.S. PAT. & TRADEMARK OFF. [hereinafter *Patent Process Overview*], <https://www.uspto.gov/patents-getting-started/patent-process-overview> [<https://perma.cc/RXQ9-M5SX>].

246. *USPTO Fee Schedule*, *supra* note 215.

247. *Patent Process Overview*, *supra* note 245.

248. *USPTO Fee Schedule*, *supra* note 215.

249. *Id.*

just under three years.²⁵⁰ Patent attorneys' fees can thus accumulate and range between \$6,000 to \$20,000 or more.²⁵¹ If the patent application is rejected, all of these fees are lost. If the application is ultimately granted, on the other hand, the applicant must pay yet more fees for issuance and publication,²⁵² ranging from \$400 to \$475 in total.²⁵³ Post-issuance, patentees are assessed maintenance fees at the 3.5-, 7.5-, and 11.5-year mark as well.²⁵⁴ Like filing fees, maintenance fees vary, but maintaining a patent through its full term requires approximately \$3,200 to over \$12,000 in fees.²⁵⁵

In total, the costs of simply obtaining a patent could run to tens of thousands of dollars and bring no guarantees of actually securing patent rights.²⁵⁶ Predicting the commercial value of an invention is also immensely difficult, adding to the gamble in deciding whether to invest in the process of applying for patent protection, even if through a provisional patent application.²⁵⁷ For disadvantaged inventors such as women, entrepreneurs, and minority groups, the financial resources needed to file a patent application are often prohibitive, causing many to forgo patent protection altogether.

Furthermore, the patent registration and examination process is not only costly but also a convenient platform for discriminatory effects, particularly in combination with the vague and often complex standards for patentability and the potential biases among patent examiners. For one thing, patentability standards are intentionally broad and vague to address not only the growing diversity of patentable technologies, but also the creation of the very unforeseeably novel technologies that the patent

250. Vic Lin, *How Long Is the US Patent Application Process (How Much Time Does It Take to Get a Utility Patent)?*, PAT. TRADEMARK BLOG: IP Q&A, <http://www.patenttrademarkblog.com/how-long-us-utility-patent-application-process/> [<https://perma.cc/4AGZ-VWR5>] (reporting average total patent pendency was thirty-three months in 2017).

251. Gene Quinn, *The Cost of Obtaining a Patent in the U.S.*, IPWATCHDOG (Apr. 4, 2015), <https://www.ipwatchdog.com/2015/04/04/the-cost-of-obtaining-a-patent-in-the-us/id=56485/> [<https://perma.cc/LGP4-M2GA>].

252. *Patent Process Overview*, *supra* note 245.

253. *USPTO Fee Schedule*, *supra* note 215. Issuance fees range from \$100 to \$175 and publication fees are generally \$300. *Id.*

254. *Id.*

255. *See id.*

256. *Id.*

257. Provisional patent applications are typically less expensive to file because they do not undergo examination and simply preserve the applicants' filing date. 35 U.S.C. § 111(b)(3). Provisional applications must be converted to nonprovisional status within a year, however, so applicants must eventually assume the full cost of prosecuting their applications. *Id.* § 111(b)(5).

system is designed to incentivize.²⁵⁸ The ambiguity of these standards, however, also allows patent examiners to exercise discretion in ways that can be discriminatory.²⁵⁹

Beyond the costs and potential biases of patent examination, another major issue is simply the abstruse nature of the process and general lack of understanding of its intricacies. As noted above, for example, female inventors often do not file for patents because they lack access to knowledgeable guidance through the process and at times have the mistaken perception that their invention is unpatentable.²⁶⁰ A lack of awareness of one's legal rights can be equivalent to having no rights at all. The modern movement toward helping disadvantaged groups gain access to the legal system²⁶¹ has led many countries to launch projects toward that end,²⁶² but these efforts are unlikely to yield significant change in the public's access to legal knowledge any time soon. This is all the more true with regard to patent laws and procedures because of their complexity.

Accordingly, even if their inventions have enough value to warrant the cost of patent prosecution, not all inventors will see filing for patent protection as worthwhile or even possible under the current system.²⁶³ A patent system that obviated the costs, complexities, and opportunity for biases inherent in the registration and examination process could go a long way to remedying the gender, race, and other gaps in patenting. The next Part discusses possible reforms to the patent regime, arguing that the challenges posed by the one-size-fits-all approach of the patent system and the distributive effects of patent registration can be addressed by the introduction of an unregistered patent regime.

258. Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1576 (2003); Emily Michiko Morris, *Res or Rules? Patents and the (Uncertain) Rules of the Game*, 18 MICH. TELECOMMS. & TECH. L. REV. 481, 486 (2012).

259. Evan J. Criddle, *When Delegation Begets Domination: Due Process of Administrative Lawmaking*, 46 GA. L. REV. 117, 162 (2011); see also Elaine Golin, *Solving the Problem of Gender and Racial Bias in Administrative Adjudication*, 95 COLUM. L. REV. 1532, 1533, 1544–49 (1995) (noting the gender, racial, and cultural biases that often plague agency decision making).

260. See *supra* text accompanying notes 215–218.

261. See Deborah L. Rhode, *Access to Justice: A Roadmap for Reform*, 41 FORDHAM URB. L.J. 1227, 1227–28 (2016).

262. See Teresa Scassa, *The Best Things in Law Are Free?: Towards Quality Free Public Access to Primary Legal Materials in Canada*, 23 DALHOUSIE L.J. 301, 329–35 (2000); Mark Adler, *The Plain Language Movement*, in THE OXFORD HANDBOOK OF LANGUAGE & LAW 67 (Peter M. Tiersma & Lawrence M. Solan eds., 2012); Kirsten Wurmman, *Public Legal Education Bibliography*, 34 CAN. L. LIBR. REV. 232, 232 (2009).

263. *Contra* David Fagundes & Jonathan S. Masur, *Costly Intellectual Property*, 65 VAND. L. REV. 677, 701 (2012) (arguing that unregistered patents are unnecessary because rational inventors will always file for protection when their inventions warrant it).

III. PROPOSALS FOR REMEDYING THE PATENT CRISIS AND THE DISTRIBUTIVE EFFECTS: UNREGISTERED PATENT RIGHTS

The authors of this Article have previously proposed a new, unregistered patent regime as a means of addressing the distributive effects of the patent registration system, but this approach would also be useful as an alternative to the current one-size-fits-all registered patent regime to address the patent crisis as well. Specifically, the limited scope and relative brevity of these unregistered rights offer a more efficient and less costly form of protection for low-value and low-investment inventions by curbing the excesses of the existing registered right system. The registered patent system would otherwise continue to be favored in most regards, as patent registration and examination serve a number of vital functions. Given the significant flaws of the current one-size-fits-all approach to patenting, however, an unregistered rights regime would serve a vital function as well.

To recapitulate the authors' previous proposal, the unregistered patent system would be an amendment to the current Patent Act²⁶⁴ modeled after the E.U.'s unregistered industrial design protection scheme.²⁶⁵ Protection would be subject to meeting the same substantive requirements applied in the current registered patents regime, including subject matter eligibility, novelty, utility, and nonobviousness, but any invention that satisfies those requirements would automatically become protected as soon as it becomes publicly available. Public availability would be defined in much the same way as it is under the current Patent Act: that is, public description in enabling detail, patenting in another country, public use, offers for sale, or any other disclosure to the public.²⁶⁶ For a process invention, public availability would also include public disclosure of products affected by use of the process. In suing for infringement of their rights, unregistered patentees therefore would have to establish their priority date by proving the date on which their inventions became public.

Upon attaching, unregistered patent rights would protect against making, using, selling, or offering to sell only knowing and direct copies of the subject invention. Patentees seeking to enforce their rights therefore would also have the burden to prove that the alleged infringers actually

264. 35 U.S.C. §§ 1–390.

265. Council Regulation 6/2002, art. 11(1), 2002 O.J. (L 3) 1 (EC); *see also* Charles-Henry Massa & Alain Strowel, *Community Design: Cinderella Revamped*, 2003 EUR. INTEL. PROP. REV. 68, 74 (providing and overview of the regulation).

266. *See* *Helsinn Healthcare S.A. v. Teva Pharm. USA, Inc.*, ___ U.S. ___, 139 S. Ct. 628, 634 (2019); *Metallizing Eng'g Co. v. Kenyon Bearing & Auto Parts Co.*, 153 F.2d 516, 518 (2d Cir. 1946).

copied their inventions. The proposed rights would thus be quite limited in scope as compared to registered patent rights. Limiting infringement to knowing copies also simplifies the infringement analysis somewhat. Litigation over unregistered rights would not have the benefit of the peripheral claiming system, under which registered patentees must limn the boundaries of their inventions with written “claims” that “particularly point[] out and distinctly claim[]” the invention.²⁶⁷ With unregistered rights, on the other hand, downstream inventors and courts are left only with what is more akin to the former central claiming system, under which infringement suits would have had to rely on equivalence between the allegedly infringing device and any examples of the patented invention described in the patent.²⁶⁸ In adjudicating infringement of unregistered patents, however, courts would at least have evidence that the defendant actually copied the subject invention.

And while any reversion to a more central-claiming approach may seem to introduce greater unpredictability and higher information costs, it is not clear that the central claiming system is significantly more unpredictable than the peripheral claiming system, however.²⁶⁹ Modern-day patent claims are notoriously difficult to interpret,²⁷⁰ and in any event patent law frequently depends on unstructured comparisons between technologies to measure things like novelty and nonobviousness.²⁷¹ Moreover, although the central-claiming approach means that unregistered protections would extend to not only identical copies but also those that are effectively equivalent to the subject invention, the proposed unregistered rights in practice would not be appreciably broader than registered patent rights. While registered patents usually protect against only infringement literally identical to the claimed invention, registered patentees typically claim their inventions broadly to include as many variations on, or “embodiments” of, their inventions as possible.²⁷²

267. 35 U.S.C. § 112(b).

268. See ROBERT P. MERGES & JOHN F. DUFFY, *PATENT LAW AND POLICY: CASES AND MATERIALS* 651, 711 (7th ed. 2017); Martin J. Adelman, *Patent Claiming in the United States: Central, Peripheral, or Mongrel?*, 1 *IP THEORY* 71, 72–75 (2010).

269. Dan L. Burk & Mark A. Lemley, *Fence Posts or Sign Posts? Rethinking Patent Claim Construction*, 157 *U. PA. L. REV.* 1743, 1747, 1751–61 (2009).

270. Janet Freilich, *Patent Clutter*, 103 *IOWA L. REV.* 925, 925 (2018).

271. Burk & Lemley, *supra* note 269, at 1758. The central claiming analysis is similar to what courts continue to do under the doctrine of equivalents (DOE) approach to construing patent claims in the peripheral claiming system. *Id.* at 1763 (noting that although the DOE is arguably more structured than infringement analyses under a central-claiming system, both methods look at the “gist” of the underlying invention to determine infringement).

272. See generally Adelman, *supra* note 268, at 72–75 (comparing and contrasting peripheral and central claiming systems).

Allowing unregistered protection against substantially similar copies of their inventions thus would likely cover only that which would otherwise have been claimed through registration. Independent creation would always be an absolute defense to infringement of such unregistered patent rights, moreover.

For much the same reasons, the proposed unregistered patent regime would not have much effect on the public-notice function of patent registration. A common complaint about the registered patent system is that in practice it has proven less than effective in giving notice to others. Inventors and others in science and technology often do not read patents for fear of being accused of willful infringement,²⁷³ and even if they did, the clearance costs of identifying and reviewing all of the patents relevant to one's research project can often be astronomical.²⁷⁴ By contrast, the simple act of copying another's invention would put copyists on notice that they might be infringing (unregistered or registered) patents, lowering their information costs in many if not most cases below those of other alleged infringers (because registered patents protect not only against copying but also against independent creation). Downstream inventors would have to examine the inventions they copy to verify the date the inventions became public, and this is not always simple or inexpensive, especially if the inventor's identity is not readily apparent. Discovering exactly when an invention became public, however, is likely no more difficult than determining the effective date of prior art that can be used to invalidate an issued patent;²⁷⁵ both inquiries depend on determining when previous technology became "public."

Returning to the structure of the proposed new regime, unregistered patent rights holders would be entitled to a presumption of validity, resembling that which registered patent holders enjoy, but rebuttable by a mere preponderance of the evidence, rather than by clear and convincing evidence.²⁷⁶ The alleged infringers would thus have the opportunity to challenge the validity of the unregistered rights under a significantly lower standard, reflecting the fact that the rights would not have been vetted by a patent office.²⁷⁷ Despite the lack of vetting, however, allowing unregistered patent holders at least this lower-level presumption of

273. Lemley, *supra* note 150, at 1510 n.63.

274. See generally Christina Mulligan & Timothy B. Lee, *Scaling the Patent System*, 68 N.Y.U. ANN. SURV. AM. L. 289 (2012) (calculating patent clearance costs).

275. See BURK & LEMLEY, *supra* note 5, at 14.

276. 35 U.S.C. § 282.

277. See *id.* (awarding presumption of validity to issued patents); *Microsoft Corp. v. i4i Ltd. P'ship*, 564 U.S. 91, 97–98 (2011) (noting that section 282 has long been interpreted as requiring clear and convincing evidence to rebut presumption that PTO correctly issued a patent).

validity would save them the additional costs and time of proving validity, thereby avoiding the additional costs of patent searches and so on to their overall enforcement costs. Indeed, defendants often are able to find invalidating prior art references more easily than even a patent office can.²⁷⁸ Having defendants proceed immediately to their invalidity arguments, rather than forcing patentees to provide validity first, may lead to faster and less costly disposition of infringement proceedings. The presumption of validity even for unregistered patent rights is in this way important to the cost-reducing objective of the proposed system.

Similar to unregistered industrial design rights,²⁷⁹ moreover, the proposed unregistered patent protections would last for only three years from the first publication of the invention. Inventors would remain eligible to apply for registered patent protections but would have to file within one year of the date on which the invention was first made public. Inventors who do not file patent applications within one year of the time their inventions become public would forfeit issued patent protection altogether, leaving them with only the remaining two years of their unregistered patent rights.

This provision is consistent with the existing U.S. patent system's one-year grace period for novelty for inventors that publicly disclose their inventions prior to filing under section 102(b) of the AIA. The AIA declares that any disclosure of an invention prior to the date on which the patent application on it is filed bars the invention from patent eligibility for lack of novelty. The exception to this rule is disclosure of the invention by its own inventors, as long as they disclose no more than one year before they file their application. More to the point, this grace period establishes an effective "first-to-file-or-first-to-publicly-disclose" system, in which such self-disclosure of an invention allows its inventor to set a de facto priority date by pre-empting any later third-party disclosures that could disprove the novelty of the invention.²⁸⁰ Allowing inventors to establish

278. In the vast majority of cases, issued patents are invalidated based on defendant-identified prior art previously unseen by the USPTO. Stephen Yelderman, *Prior Art in the District Court*, 95 NOTRE DAME L. REV. 837, 883–84 (2019); Shine Tu, *Invalidated Patents and Associated Patent Examiners*, 18 VAND. J. ENT. & TECH. L. 135, 159–61 (2015).

279. Several jurisdictions offer protection for new unregistered industrial designs once they become publicly available. Most prominent of these protections is in the European Union, which protects unregistered designs under the Community Design Regulation (CDR). Council Regulation 6/2002, art. 11(1), 2002 O.J. (L 3) 1 (EC); *see also* Massa & Strowel, *supra* note 265, at 74 (providing and overview of the regulation). This regulation protects an unregistered design for a period of three years from the date it first was made available to the public in a way that specialists in the relevant sector could be reasonably assumed to know of the design. Council Regulation 6/2002, art. 11(1), 2002 O.J. (L 3) 1 (EC). To be eligible for protection, a design must be new and of individual character over prior designs. *Id.*

280. *See* MERGES & DUFFY, *supra* note 268, at 390–91.

priority in this way gives both registered and unregistered rights holders the incentive to disclose their inventions publicly as soon as possible. Almost all countries allow inventors to disclose their inventions publicly up to a year before filing without anticipating themselves or otherwise being barred from patent eligibility.²⁸¹ This one-year grace period would not give inventors much time to prepare and file their patent application, but it does at least provide both registered and unregistered rights holders the right to prevent others from copying their inventions during that time.

And if inventors do opt to file for registered rights, they would not automatically be entitled to registered patent rights, even if their unregistered patent rights were found to be valid by a court of law. Full examination with the patent office would ensure that the patent office maintains authority to issue registered patents. Nonetheless, the proposed unregistered rights preserve the same twenty-one-year maximum effective duration of protection allowed under existing U.S. patent law. Granted, even under U.S. patent law, patentees cannot sue others for infringement occurring in that first pre-filing year, the way they would be able to under the proposal here.²⁸² That being said, under both systems, an inventor who applies for registered patent rights within a year of publicly disclosing their invention can force others to wait to practice the invention until the twenty-first year after that initial pre-filing disclosure.

A. *Distributive Effects Under an Unregistered Patent System*

As the authors have written elsewhere, one of the major benefits of the proposed two-tiered regime is that it would offer automatic patent rights without the need for a lengthy, costly, and often biased registration process. Unregistered rights would thus offer a toe-hold to inventors such as women and racial and ethnic minorities, who are often effectively excluded from the current system. Moreover, unregistered rights require no awareness or motivation to file, compensating for the fact that disadvantaged inventors do not have access to the kind of guidance and legal expertise that other patentees have. The broader effect of unregistered rights could thus provide disadvantaged inventors with better economic leverage and lead to changes in perception of innovation by women and racial minorities.

The potential investors would also have more incentives to invest in the subject inventions, as investors would have the assurance that the

281. WORLD INTELL. PROP. ORG., CERTAIN ASPECTS OF NATIONAL/REGIONAL PATENT LAWS (2019), https://www.wipo.int/export/sites/www/scp/en/national_laws/grace_period.pdf [<https://perma.cc/Q2MS-V9UQ>].

282. 35 U.S.C. § 273(a)(2).

inventions are protected automatically for at least three years. Of course, unregistered patents would be much shorter in duration than registered patents and would not benefit from the USPTO's imprimatur of validity or a presumption of validity rebuttable only by clear and convincing evidence. Once they make their inventions public, however, unregistered patent owners effectively establish priority for themselves should they opt to apply for registered rights within the one-year grace period allowed under U.S. patent law.²⁸³ This combination of three years of unregistered protection and priority in filing for the more robust protections of a registered patent could provide investors with the strong positive signals that they want. And even issued patents have only probabilistic validity under the clear and convincing evidence standard,²⁸⁴ and the U.S. Federal Circuit Court of Appeals, has become notorious for disagreeing with the USPTO and the lower courts on questions of patent validity and scope.²⁸⁵ Investing in unregistered patents therefore may not be significantly riskier than investing in registered patents.

To be sure, when rights are unregistered, their acknowledgement and enforcement is transferred to the courts, replacing one human agent with another one. Human intervention is not eliminated altogether but rather is replaced. Yet, courts are more committed to due process than administrative agencies,²⁸⁶ as agencies lack many of the procedural justice and due process constraints to which courts must adhere.²⁸⁷ The judiciary also are unlikely to suffer from the same biases as those in many technological fields or to have any associative connections with, or favorable inclinations toward, those who work in those fields;²⁸⁸ the USPTO, by contrast, draw their examiners from science and

283. See *supra* text accompanying notes 280–281.

284. Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, 19 J. ECON. PERSPS. 75, 75–76 (2005).

285. See David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223, 259 (2008).

286. See A. Dan Tarlock, *Administrative Law: Procedural Due Process and Other Issues*, 56 CHI.-KENT L. REV. 13, 13–14 (1980); Alan B. Morrison, *Administrative Agencies Are Just Like Legislatures and Courts—Except When They're Not*, 59 ADMIN. L. REV. 79, 80–84 (2007).

287. See Ronald J. Krotoszynski, Jr., *Taming the Tail That Wags the Dog: Ex Post and Ex Ante Constraints on Informal Adjudication*, 56 ADMIN. L. REV. 1057, 1058 (2004).

288. See Martin H. Redish & Kristin McCall, *Due Process, Free Expression, and the Administrative State*, 94 NOTRE DAME L. REV. 297, 298 (2018). But see Adrian Vermeule, *Essay, Deference and Due Process*, 129 HARV. L. REV. 1890, 1928–29 (2016) (arguing that agency motivation seldom affects decision-making).

technology.²⁸⁹ Judges are subject to their own biases,²⁹⁰ but granting rights automatically *ex ante*, without agency intervention, and then allowing courts to adjudicate the validity of those rights *ex post* may help protect against bias.

Of course, enforcement costs even for unregistered rights could still be exorbitant. While rights holders under both regimes would have to incur significant costs when later attempting to enforce those rights, at least under the unregistered regime they would not have to face the often prohibitively high costs for obtaining those rights at the outset. And while the value of investing in obtaining protection for an invention is often speculative at best, once the invention has been copied, the value of investing in enforcing rights against copying the invention becomes less speculative. Even inventors who are not aware of their rights will be more motivated to learn about them and enforce them once infringement is detected.

B. *The Patent Crisis Under an Unregistered Patent System*

New to the proposal here is the surprising fact that, in addition to mitigating the underprotection of disadvantaged inventors, an unregistered patents regime could also mitigate the overprotections that underlie the current patent crisis. An unregistered patent alternative could be used to channel more trivial innovations—as measured in terms of low investment or low social value—away from the full-blown protections of the registered patent system, thereby mitigating deadweight losses and the innovation stifling effects of anticommons and patent thickets.

First, the proposed regime would mitigate the problem of deadweight loss associated with patent monopolies. Because patentees of low-investment and low-value inventions would be entitled to protection only against direct copying of their inventions, independent creators of the same inventions would be able to compete down the prices the patentees can charge. Likewise, the inventions would be protected for only a short term, limiting the duration of the patentees' ability to charge supracompetitive prices, even if there are no independent creators to

289. Redish & McCall, *supra* note 288, at 307–08 (noting that “biased assimilation” makes people more “likely to credit or dismiss evidence or argument selectively based on how it conforms to their group, belief, or position”). And while administrative agency discretion is subject to judicial review, this review often tends to be deferential. *See, e.g.*, *Dickinson v. Zurko*, 527 U.S. 150, 152 (1999) (holding that Administrative Procedures Act generally requires judicial deference to agency findings of fact); Krotoszynski, *supra* note 287, at 1060 (describing judicial review of agency decisions as an “imperfect mechanism for ensuring fair process in the first instance”).

290. Thomas W. Merrill, *Fair and Impartial Adjudication*, 26 *GEO. MASON L. REV.* 897, 897 (2019) (noting possibility of biases in courts as well as agencies).

create a more competitive market.

Second, the proposed regime would attenuate the effects of both the anticommons and patent thicket phenomena. If registered protection is reserved mainly for inventors of high-quality, high-investment inventions, and low-value and low-investment inventions are relegated to unregistered rights, the overall patent burden will be greatly reduced, in turn reducing the chances for anticommons and patent thickets. Again, the proposed unregistered patent rights limit infringement liability to those who copy, not to those who independently create, thereby creating a safe harbor for most potential patent infringers, given that those sued for infringement are most often independent creators who just happened to be second-in-time.²⁹¹ Although copyists may be overdeterred, copying in itself provides little social value other than lowering prices by free riding on others' inventive efforts. Unlike the registered patent system, moreover, the proposed regime would not impose treble damages for knowing infringement.²⁹² Competitors therefore would have even less incentive to turn a blind eye to the latest developments in their field to avoid claims of copying.

Additionally, unlike unregistered copyright, trade secrecy, or trademark protections, the proposed unregistered patent rights would last for only three years. This creates another significant safe harbor for those who wait before copying another's invention and greatly reduces the window in which they would face the risk of patent trolling, nuisance suits, thickets, and holdouts. The ability of patentees to extract excessive royalties and hold out would be significantly reduced under an unregistered patent regime, and, as a result, the effects of anticommons tragedies or patent thickets would be very limited. To illustrate this, consider again the situation in which several patentees hold patent rights on different components that are necessary inputs for the production of a single product. With both the limited scope and limited duration of their rights, these patentees would have limited power to hold out and extort rents from the producer.²⁹³

Finally, were patentees provided with a limited form of patent protection that coincides with their low-investment and low-value inventions, as we proposed here, inventors would have a greater incentive to engage in complex, expensive, and, most importantly, valuable inventive activities. They will also have an incentive to engage in less valuable activities as well under the proposed model because they still

291. JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE* 123–24 (2008).

292. THOMAS F. COTTER, *COMPARATIVE PATENT REMEDIES: A LEGAL AND ECONOMIC ANALYSIS* 23 (2013).

293. *See supra* Part II.

would be awarded fairly and receive adequate compensation for those efforts. The proposed two-tiered patent regime in this way would be more consistent with the IP clause of the U.S. Constitution because it would help promote progress in the useful arts.

That being said, how to convince inventors who have the resources to apply for registered patent protections to nonetheless settle for the lesser protections of unregistered patents is key. The availability of automatic protections under the unregistered patent scheme would encourage many inventors of low-value, low-investment patents to elect that alternative just as creators often do under copyright and trademark law, effectively weeding out such inventions from registration-based route of protection. Many technologies like computer software and electronics do not need a full twenty years of patent protection, as their product development and market cycles are brief and rapid.²⁹⁴ Three years of protection against copying under the proposed unregistered patent rights could be more than enough to recoup investments in these industries, particularly if the underlying invention is of high commercial value. Inventors therefore might voluntarily opt for the immediate protections of unregistered patent rights. Saving the not insignificant expense and delays of applying for registered patent protection also could yield greater returns on their investments. In this way, the proposed system would naturally channel some types of invention toward this less costly scheme of protection.

For a great number of inventors, however, uncertainty about their inventions' life cycles and the desire to maximize revenues would presumably drive them to opt for twenty years of full patent rights. This Article accordingly proposes a number of "sticks" to impel inventors toward the unregistered rights regime, similar to the kinds of constraints also seen to some extent in the two-tiered regimes in copyright and trademark law as well, and for many of the same reasons. One of the authors of this Article has previously suggested one such measure, for example: creating a new patentability requirement that inventors disclose at least some credible evidence of the R&D investment needed for the subject invention.²⁹⁵ This evidence would comprise state and federal

294. Verne A. Luckow & Steven C. Balsarotti, *Statistical Analysis of Federal District Court Cases Seeking Longer Patent Term Adjustments in the Wake of Wyeth v. Kappos*, 10 J. MARSHALL REV. INTELL. PROP. L. 1, 3 (2010).

295. Miriam Marcowitz-Bitton, Yotam Kaplan & Maayan Perel, *Recouping Patent*, 98 N.C. L. REV. 481, 519–20 (2020).

income tax filings,²⁹⁶ SEC filings,²⁹⁷ publicly traded companies' regulatory reporting schemes,²⁹⁸ private companies' by-laws and reporting requirements,²⁹⁹ and so on. In the proposed two-tiered system, R&D investments that do not meet some minimum threshold level could then be disqualified from obtaining registered patent rights or—if less coercive measures were desirable—charged significantly higher filing fees. (Although this latter measure might effectively disqualify disadvantaged inventors who cannot afford higher filing fees, these inventors would still have their unregistered rights on which to fall back.)

An even more administratively simple method would be a presumption of unregistrability for certain technologies such as business methods or computer software, which could funnel what are typically low-investment inventions of often dubious patentability into the unregistered rights regime. In many ways, this presumption would simply formalize what is now a general expectation that most business methods and software are unpatentable subject matter, but giving inventors in these fields the automatic option of unregistered rights could alleviate what has otherwise become a quagmire in the law on patentable subject matter.

To alleviate the patent crisis in other ways, inventive entities who do not themselves practice their own inventions could be required to submit credible evidence of a good faith intent to license their patents to entities who would. This intent-to-license requirement would be similar to the intent-to-use requirement in trademark registration. Inventors who cannot produce such evidence could be denied registrability, and even inventors who do prove an intent to license could be required to sign a terminal disclaimer curtailing their registered rights if such licensing does not occur within a given period of time. Directing nonpracticing entities in this way toward the narrow scope and breadth of unregistered rights could help protect against abuse of registered rights by patent trolls to extort rents from unwitting infringers.

It is easy to see the advantages of constraining low-investment, low-value inventions to unregistered patent rights—again, these types of

296. See generally Jeffrey A. Dubin & Louis L. Wilde, *An Empirical Analysis of Federal Income Tax Auditing and Compliance*, 41 NAT'L TAX J. 61 (1988) (discussing tax compliance issues and the effectiveness of tax filings, audits, and the IRS in ensuring accurate disclosure).

297. On the significance of SEC filings, see generally Earl K. Stice, *The Market Reaction to 10-K and 10-Q Filings and to Subsequent The Wall Street Journal Earnings Announcements*, 66 ACCT. REV. 42 (1991).

298. See Ray Ball, *Infrastructure Requirements for an Economically Efficient System of Public Financial Reporting and Disclosure*, in BROOKINGS-WHARTON PAPERS ON FINANCIAL SERVICES: 2001, 127, 127 (Robert E. Litan & Richard J. Herring eds., 2001).

299. See *id.* (sketching “the principal infrastructure requirements for an economically efficient system of public financial report[s]” and disclosure).

inventions do little to “promote the Progress of . . . useful Arts.”³⁰⁰ Low-investment but high-value inventions, on the other hand, are still within the category of inventions the patent system should incentivize, but as noted above, these inventions will likely recoup their investments even with only unregistered rights. These inventions would still be protected for three years, which if they have value may be enough time for them to earn sufficient profits, and although they would also be protected against only copyists, not against independent creators, independent creation would suggest that these inventions would have been invented anyway without incentive of registered patent rights. And if an invention is of high-value, but low-investment, there is all the more reason to limit its protections in order to limit the potential for hindering others’ use of the invention, thereby lowering both deadweight losses and barriers to future innovation.

Inventions that require high levels of investment, by contrast, would all receive full registered patent rights. Registered patent rights would still lead to deadweight losses and the potential to impede innovation by others, but again, for high-investment and high-quality inventions, this is still a worthwhile cost-benefit ratio.³⁰¹ The one quadrant of inventions that may be troublesome under the proposed two-tiered regime is high-investment but low-quality inventions, which can have a considerable effect on future innovation, particularly in complementary or cumulative technologies. On the one hand, if an invention has little or no social value, a registered patent on it is unlikely to incur much in deadweight losses. Similarly, if the invention has little or no technological value, registered rights pose less of a possibility of anticommons or patent thickets, particularly if meaningful alternatives to the invention are available. Nonetheless, registered patents on such inventions could pose a particularly dangerous potential for abuse against inadvertent infringers. Inventions of this type may be relatively few in number, however. Assuming that the level of monetary investment in an invention at least roughly correlates with the value of the invention, both socially and technologically, the high-investment but low-value invention will tend to be less common. Perhaps more importantly, assuming that inventors and those who fund them are rational, both will typically take pains to avoid investing heavily in inventions of low value, as the odds will be greater that the invention will never recoup their investment. High-investment but low-value inventions are therefore most likely to arise when inventors try

300. See *supra* text accompanying note 145 (discussing the intellectual property clause, Article I, Section 8, Clause 8 of the U.S. Constitution).

301. See *supra* text accompanying notes 159–179.

to salvage something patentable from an otherwise failed inventive effort.

The value of an unregistered patent rights regime while maintaining the stronger incentives of registered rights for high-value and high-investment inventions becomes clear. This proposal can remedy, at least partially, the challenges posed by the one-size-fits-all patent regime and the distributive effects of registered patent regimes by providing easier access to patent protection. As patent law's insistence on requiring registration likely contributes to distorted incentives for inventors of low-value and low-investment inventions and to the gender, racial, ethnic and economic gap in patenting, an unregistered patent regime would go far in tailoring protection for both of these groups. Notably, the new regime would require periodic evaluation to measure how many low-value and low-investment inventions rely on unregistered patents and to what extent gaps in patent filings persist in gender, racial, ethnic, and economic groups. And although it is not a comprehensive solution, which would require much more far-reaching changes to standards for patentability and in empowering women and disadvantaged minorities more generally, the proposed unregistered patent regime would serve as a significant measure and a more optimal scheme for incentivizing low-value and low-investment inventions.

IV. THE BENEFITS OF A TWO-TIERED PATENT MODEL

Despite the large body of scholarship documenting both the patent crisis and the distributive effects of patent registration, the patent system has yet to implement reform proposals that can remedy or at least alleviate either of these problems. Unregistered patent rights could play a major role in this reform. Over the years, legal scholars also have proposed changes in judicial interpretation of legal patent doctrines, as well as other targeted solutions to nonpatent related challenges certain disadvantaged groups face.³⁰² Many of the previous proposals, however, cannot easily be addressed or will take a lot of time and money to implement. Many also have proposed changing the design of the patent regime to remedy the problems from its one-size-fits-all nature, as well as the distributive effects of patent registration.³⁰³ Several of the proposed reforms, ranging

302. See Keith Aoki, *Distributive and Syncretic Motives in Intellectual Property Law (with Special Reference to Coercion, Agency, and Development)*, 40 U.C. DAVIS L. REV. 717, 774–79 (2007).

303. E.g., BESSEN & MEURER, *supra* note 4, at 2–4; BURK & LEMLEY, *supra* note 5, at 1, 4–6; Michael Abramowicz, *Orphan Business Models: Toward a New Form of Intellectual Property*, 124 HARV. L. REV. 1362, 1406–07 (2011); Michael J. Burstein, *Rules for Patents*, 52 WM. & MARY L. REV. 1747, 1761–62 (2011); Daniel R. Cahoy, *An Incrementalist Approach to Patent Reform Policy*, 9 N.Y.U. J. LEGIS. & PUB. POL'Y 587, 635–36 (2006); Michael W. Carroll, *One for All: The Problem*

from moderate to comprehensive, seek to address the current patent crisis. Compared to the relatively streamlined two-tiered regime proposed here, however, the complexity of these latter proposals would be much more administratively burdensome and could lead to greater uncertainty in the patent system, undermining its effectiveness.

Professors Bell and Parchomovsky, for instance, have introduced the idea of lowering deadweight losses by allowing patentees to choose what level of protection they receive in terms of rights granted, scope, and remedies.³⁰⁴ These different levels of protection would also entail different levels of patent fees to reflect the value of the rights sought. Inventors whose technologies are likely to have shorter effective commercial lives would be able to pay less in filing fees for a shorter patent term.³⁰⁵ Similarly, inventors who plan to use their patents mostly for licensing could pay fewer fees if they agreed to waive their rights to injunctive relief.³⁰⁶ Inventors who by contrast need longer effective patent lives or more robust rights would also have the choice to pay for greater levels of protection. By thus tailoring patent protections to the needs of the patentee, their suggested model would reduce associated deadweight losses.³⁰⁷

Professors Bell and Parchomovsky's proposal suffers from a number of salient problems, however. First, the model would be most costly and difficult to administer because it would necessitate the creation of not just two different types of patents but instead a whole panoply of patent categories and accompanying fees. It would also require inventors to predict how much patent scope and duration they would need to earn sufficient revenues. This calculation would be difficult in technologies with unpredictable market demand and would depend as well on predictions of post-patenting commercialization costs, which for technologies such as those that are science-based are also unpredictable.

Second, the patentees' absolute freedom to choose the desired length and scope of protection, which Bell and Parchomovsky view as one of the

of Uniformity Cost in Intellectual Property Law, 55 AM. U. L. REV. 845, 847–49 (2006); Eric E. Johnson, *Calibrating Patent Lifetimes*, 22 SANTA CLARA COMPUT. & HIGH TECH. L.J. 269, 290–93, 297–300 (2006); Amir H. Khoury, *Differential Patent Terms and the Commercial Capacity of Innovation*, 18 TEX. INTELL. PROP. L.J. 373, 407 (2010); Jonathan S. Masur, *Regulating Patents*, 2010 SUP. CT. REV. 275, 321–26; Peter S. Menell, *A Method for Reforming the Patent System*, 13 MICH. TELECOMMS. & TECH. L. REV. 487, 495, 508 (2007); Peter S. Menell & Michael J. Meurer, *Notice Failure and Notice Externalities*, 5 J. LEGAL ANALYSIS 1, 50 (2013); Jensen et al., *supra* note 11, at 307–09 (proposing to redact inventor's name as a way to avoid bias).

304. Bell & Parchomovsky, *supra* note 138, at 234.

305. *Id.* at 234–35.

306. *Id.*

307. *Id.* at 235.

major advantages of their proposal,³⁰⁸ is also a major drawback. For well-heeled patent holders and potential patent trolls, for example, a higher fee for broader protection may not be sufficiently threatening by itself to channel them toward lower protection levels. Patent trolls, for example, would continue to purchase higher levels of patent protection to extract excessive rents through aggressive litigation, as they do now. Unless the differentials in the patent fees are greater than present value of the additional revenues patent holders might earn from abusing higher levels of protection, applicants will elect stronger and longer patent rights. Without any objective guidelines or external review, a nonregulated, self-tailored regime of patent protection can easily miss its goals.

Third, and much more important to the analysis in this Article, Bell and Parchomovsky's self-tailored regime may disfavor less well-heeled and experienced powerful inventors. On the one hand, their model would do nothing to help disadvantaged inventors who are already discouraged from seeking patent rights by the current costs of registration and examination. Indeed, their model could serve to aggravate the distributive effects of patent registration. Inventors may be forced to agree to less protection than they need to recoup their initial investment costs if they cannot afford the higher fees associated with this protection, particularly if those fees are set at levels high enough to deter patent trolling. Hence, Bell and Parchomovsky's model could effectively impair deserving but disadvantaged inventors without having any meaningful effect on patent abuse. This in turn would inefficiently reduce incentives to invent and would slow technological progress.

Professors Burk and Lemley, by contrast, suggest a technology-specific system of patent protection,³⁰⁹ adding to the growing body of technology-specific patent reform proposals.³¹⁰ Burk and Lemley suggest that courts

308. *Id.*

309. See generally Burk & Lemley, *supra* note 258; Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 BERKELEY TECH. L.J. 1155 (2002) [hereinafter Burk & Lemley, *Is Patent Law Technology-Specific?*] (describing recent trends of increasing divergence between the ways patent law rules are applied in different industries).

310. *E.g.*, BURK & LEMLEY, *supra* note 5, at 97; Abramowicz, *supra* note 303, at 1406–07; Burstein, *supra* note 303, at 1761–62; Cahoy, *supra* note 303, at 635–36; Carroll, *supra* note 303, at 847–49; Johnson, *supra* note 303, at 290–93, 297–300; Khoury, *supra* note 303, at 407; Masur, *supra* note 303, at 321–26; Menell, *supra* note 303, at 495, 508; Menell & Meurer, *supra* note 303, at 50; Joshua D. Sarnoff, *The Patent System and Climate Change*, 16 VA. J.L. & TECH. 301, 307–09 (2011); F.M. Scherer, *Nordhaus' Theory of Optimal Patent Life: A Geometric Reinterpretation*, 62 AM. ECON. REV. 422, 427 (1972); William Fisher III, *The Disaggregation of Intellectual Property: How the Laws of Intellectual Property Have Grown—and Grown Apart*, HARV. L. BULL. (July 1, 2004), <https://today.law.harvard.edu/disaggregation-intellectual-property/> [<https://perma.cc/UT83-CCAW>]; Richard A. Posner, *Why There Are Too Many Patents in America*, THE ATL. (July 12, 2012), <http://www.theatlantic.com/business/print/2012/07/why-there-are-too-many-patents-in-america/259725/> [<https://perma.cc/63G8-R5SA>].

vary their application of patentability doctrines according to the technological field and industry to which an invention belongs.³¹¹ Using the software and biotechnology industries to demonstrate this concept, Burk and Lemley argue that courts frequently (but perhaps unwittingly) use the “person having ordinary skill in the art” standard common to many patent law doctrines to tailor patent scope.³¹² They therefore advocate more explicitly for use of patentability standards to help tailor what is otherwise the one-size-fits-all nature of the patent system.³¹³

As useful as more nuanced patentability doctrines may be in improving patent quality and fit, however, Burk and Lemley’s patent system still relies on a binary, full-patent-rights or no-patent-rights approach that both underprotects and overprotects. While Burk and Lemley are clearly correct in their observation that we can, in a general sense, characterize the overarching differences between different fields of technology, the inventions within a specific field of technology are hardly monolithic in their characteristics.³¹⁴ The two-tiered regime proposed in this Article therefore takes a more fine-grained approach that distinguishes between individual inventions themselves rather than merely between individual industries. This approach is also easier to administer, as characterizing individual inventions based on the information applicants supply is much cheaper and easier than attempting to characterize entire industries and how patent protection affects them.³¹⁵ Furthermore, Burk and Lemley’s patent system allows patentees to try to game the system by strategically drafting their patent applications to fit the categories of technology they perceive to be more advantageous.³¹⁶

Professor Roin has also proposed a tailored patent system similar to, but less discretionary than Bell and Parchomovsky’s model.³¹⁷ Noting that certain inventions have longer development cycles and take longer to

311. Burk & Lemley, *Is Patent Law Technology-Specific?*, *supra* note 309, at 1158–85.

312. *See id.* at 1156, 1185, 1189–91.

313. *Id.* at 1194–96.

314. *See* Bell & Parchomovsky, *supra* note 138, at 275.

315. *Id.*; Anna B. Laakmann, *An Explicit Policy Lever for Patent Scope*, 19 MICH. TELECOMMS. & TECH. L. REV. 43, 45 (2012). The boundaries between technologies are also highly ambiguous and mutable. BURK & LEMLEY, *supra* note 5, at 97–99; Benjamin N. Roin, *The Case for Tailoring Patent Awards Based on Time-to-Market*, 61 UCLA L. REV. 672, 710 (2014). Technological and market conditions evolve rapidly, further complicating the task of designing and implementing technology-specific patent laws that keep pace with these changes. Roin, *supra*, at 711.

316. Bell & Parchomovsky, *supra* note 138, at 275. This is exactly what inventors of software and business methods did once courts began to declare them unpatentable subject matter. *See* Roin, *supra* note 315, at 710–12; *see also* R. Polk Wagner, *Understanding Patent-Quality Mechanisms*, 157 U. PA. L. REV. 2135, 2146 (2009) (describing use of strategic claim drafting).

317. Roin, *supra* note 315, at 672.

reach the market than others,³¹⁸ Roin argues that longer patent terms would better reward such inventions without stifling other innovations in the same field because of their similarly longer development cycles.³¹⁹ He also posits that an invention's time-to-market also reliably indicates its R&D costs, its risk of failure in R&D, its anticipated future revenue streams, and its potential for imitation by rivals.³²⁰ Roin therefore also stands for the proposition that "inventions' time-to-market strongly correlates with optimal patent strength."³²¹

Like the proposals mentioned above, however, Professor Roin's proposed system poses some problems. Assuming that Roin is correct that an invention's time-to-market accurately indicates R&D investment, risk, and likelihood of returns, calculating time-to-market is fairly straightforward. Roin neglects the possibility, however, that some inventions may have longer times-to-market not because of the invention itself, which may have required relatively little investment, but because of external factors, such as development of complementary or cumulative technologies or the need to develop other infrastructure (think of biofueled cars and their dependence on an infrastructure of biofueling stations). These same issues plague the use of so-called secondary or objective factors, such as commercial success or long-felt need, in nonobviousness analyses; although an invention may be a commercial success or may respond to a long-felt need—or, as in Roin's system, may take longer to reach the market—this may be due to economic or other factors rather than the technological merits of the invention itself.

Professor Perel has also proposed a novel method of patent valuation for licensing purposes.³²² Her suggestion is that patent value should correlate with the social and technological contribution of an invention based on exhaustive analysis of how well the invention fits the patentability requirements, its prospective uses, the degree to which it relied on patent incentives, and so on.³²³ Based on this analysis, the inventor would then be granted a patent that could be licensed only within a prescribed range of prices.³²⁴ This would on the one hand encourage more investment in high-quality innovation and on the other hand set ex ante limitations on licensing fees to deter patent trolling and minimize the

318. *Id.*

319. *Id.* at 676.

320. *Id.* at 684.

321. *Id.*

322. Maayan Perel, *An Ex Ante Theory of Patent Valuation: Transforming Patent Quality into Patent Value*, 14 J. HIGH TECH. L. 148, 196–222 (2014).

323. *Id.* at 202–13.

324. *Id.* at 213–22.

effect of bargaining leverage during licensing negotiations. This in turn would hamper patentees' ability to hold up subsequent innovation and impede future research and perhaps thereby also reduce litigation costs and litigation rates.³²⁵

While Professor Perel's suggestion is in many ways ideal for matching the costs of patent protection with its benefits, it would be extremely costly and difficult—if not in fact impossible—to administer. Moreover, her proposal is limited to licensing and would not affect a patentee's ability to price its own market products and services supracompetitively or the deadweight losses caused as a result. Important for the purposes of this Article, moreover, inventors would still have to undergo registration and examination in order to obtain patent rights, and with the exponentially more intensive examination that would be required under Perel's system, registration and examination costs could be astronomical. Perel's proposal therefore could easily exacerbate the distributive effects of the patent system.

As mentioned above, another proposal made by one of the authors of this Article introduces a new "recoupment patent" regime.³²⁶ Professor Marcowitz-Bitton and her co-authors advocate replacing the current one-size-fits-all model with an approach that offers different periods and different levels of protection based on the specific level of investment made in any given invention. Under this recoupment patent model, patent protection would expire once the investment is recouped and a fixed percentage of profit is earned. Filing and renewal fees will also be calculated based on documented investment. Additionally, investment will serve as a basis for calculating royalties (or damages in subsequent litigation). This regime would more accurately incentivize innovation while avoiding the excessive protection under the current one-size-fits-all system. Like other proposals for tailored systems, however, this recoupment regime would raise administration and examination costs considerably, which in turn may worsen distributive effects.

A very different line of proposals is to supplement or even replace the patent system with prizes and rewards.³²⁷ For example, Professors Shavell and van Ypersele described a prize system that inventors could opt into

325. *Id.* at 181–96.

326. Marcowitz-Bitton et al., *supra* note 295, at 523–31.

327. See BURK & LEMLEY, *supra* note 5, at 44–45; Michael Abramowicz, *Perfecting Patent Prizes*, 56 VAND. L. REV. 115, 119–20 (2003) (reviewing the literature suggesting prizes as an alternative to the current patent system); Mark D. Janis, *Patent Abolitionism*, 17 BERKELEY TECH. L.J. 899, 939–41 (2002).

by waiving their patent rights,³²⁸ and Professor Kremer proposed a similar system in which patent recipients would agree to give up their patents in exchange for compensation that would be determined through a unique auction process.³²⁹ While prizes and rewards have long been discussed as an alternative to the unitary nature of the patent system, there is also broad agreement that prize and reward systems would present quite thorny problems of administration.³³⁰ Systems that allowed inventors to choose between prizes or patents, for example, would have to be protected against political influence and agency capture. Prizes based on social value of an invention, such as that proposed by Shavell and van Ypersele, would face the difficulty of measuring social value, particularly in unpredictable or new technologies, and in any event there is plenty of debate about whether inventors should be able to appropriate the full social value of their contributions. Professor Lichtman, on the other hand, proposes a way of achieving the benefits of a prize system without its costs by retaining patent protections but subsidizing consumers who might be priced out of the market as a result.³³¹ While avoiding the administrative costs of prize systems, however, Lichtman's proposal merely substitutes them with the administrative costs of calculating appropriate consumer subsidies and how to allocate them.

A discussion of all of the different alternatives to the unitary regime of the current patent system is beyond the scope and space limits of this Article. The analysis in this Part does at least, however, provide a broad sense of how the two-tiered patent regime proposed in this Article compares to other such proposals. In doing so, this Part also illustrates the advantages of such a two-tiered regime and its relative simplicity and yet comprehensive effect. A two-tiered regime that allows for both full registered patent rights where warranted and more limited but automatic unregistered rights where necessary would go far to reduce the distributive effects of the existing system while simultaneously relieving the effects of the patent crisis.

CONCLUSION

This Article proposes a novel model for patent protection designed to

328. Steven Shavell & Tanguy van Ypersele, *Rewards Versus Intellectual Property Rights*, 44 J.L. & ECON. 525, 525–27 (2001).

329. Michael Kremer, *Patent Buyouts: A Mechanism for Encouraging Innovation*, 113 Q.J. ECON. 1137, 1146 (1998).

330. See Abramowicz, *supra* note 303, *passim*.

331. Douglas Gary Lichtman, *Pricing Prozac: Why the Government Should Subsidize the Purchase of Patented Pharmaceuticals*, 11 HARV. J.L. & TECH. 123, 123–25 (1997).

overcome the epidemic of low-quality patents and the crisis it has generated, as well as to offset gender, ethnic, racial, economic, and other gaps in patenting. To remedy these problems, this Article advocates the implementation of an unregistered patent regime that would grant patent protection automatically, without the various costs imposed by the current registered rights regime. As noted above, copyright and trademark law both offer two avenues of protection, one for registered rights and another for unregistered rights.³³² Only patent law remains a holdout in requiring registration to obtain protection, despite the fact that many inventions do not require twenty years of registered patent protection and the fact that many female and disadvantaged inventors are disproportionately less likely to apply for or receive patent protection.³³³

Although this unregistered patent regime could not by itself solve the patent crisis and achieve gender, ethnic, racial, and economic parity in patenting, this model's relaxation of the registration requirement, together with the safeguards the proposed regime introduces, is a step in the right direction to expedite the registration of high-value inventions while narrowing the identified patenting gaps and remedying their detrimental consequences.

332. See *supra* sections II.B–D.

333. See Kanze et al., *supra* note 6, at 588; MILLI ET AL., *supra* note 6, at 18–20; Martinez et al., *supra* note 7, at 6–8.

