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Innovation or Monopoly? Making Patents Work

By Wayne T. Brough

When evaluated from an economic perspective, there are circumstances in which the current patent system can support innovation, but there are also situations in which it fails to do so or may even be counterproductive.

Executive Summary

Patents have been a topic of debate for as long as they have existed. While the market exclusivity provided by a patent creates incentives for inventors, legitimate concerns exist about the potential for patents to become a tool for collecting monopoly rents. Finding the correct balance between monopoly and innovation can be challenging; patent reform should focus on improving the quality of patents as well as improving the ability to remove low-quality patents from the system. This reduces the possibility of patent abuse while ensuring that patents reward real innovation.

Introduction

The American patent system is a vital component of innovation policy. It is derived directly from the Constitution, which granted Congress the authority to "promote the progress of science and useful arts."¹ A clear delineation of rules and processes for securing and enforcing patents can spur research and development throughout

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^{1.} U.S. Const. art. I, § 8, cl. 8.



the economy, from cutting-edge technologies to life-saving drugs. Yet patent laws, like any other laws, have costs as well as benefits and are susceptible to political pressure and rent-seeking behavior. These pressures can thwart the intended goals of promoting innovation in favor of narrower, self-interested ambitions such as protecting monopoly rents.

Early in the nation's history, Congress passed the Patent Act to encourage innovation. The history and economic operation of intellectual property law define patents as an artificial scarcity created by the government to encourage more invention. This scarcity creates a monopoly that allows inventors the possibility to recoup their investments. As a result, the role of intellectual property law is significantly different from the "natural property rights" that apply to tangible property, but that is not surprising given the differences between the two types of property.²

As William Landes and Richard Posner explain, "intellectual property law is a complex amalgam of frequently amended federal statutes, together with common law principles, both state and federal, and some state statutes; and the economic issues are considerably more intricate."³ This knotty mix creates opportunities for special interests to abuse and exploit the patent system, not only putting innovation at risk but also undermining the very institutions that paved the way for economic success in a global economy.

Important sectors of the economy face considerable challenges under the current U.S. patent system, often due to poor-quality and overly broad patents that should not have been granted in the first place. The problem of invalid patents in the technology sector, for example, has been widely acknowledged.⁴ Additionally, the patent system is vulnerable to strategic behavior by actors focused more on extracting monopoly rents than increasing invention. For example, strategically deployed patent thickets often raise costs and limit entry in the pharmaceutical industry, which can reduce competition and impede innovation rather than promote progress.⁵ At the same time, non-practicing entities (NPEs)—also referred to as patent assertion entities (PAEs)—often acquire patents not for invention, but for litigation aimed at wresting royalties and licensing fees from those who are trying to innovate.⁶

When evaluated from an economic perspective, there are circumstances in which the current patent system can support innovation, but there are also situations in which it fails to do so or may even be counterproductive. For example, patents can be either good or bad in terms of quality and their ability to encourage invention. This variability in patent quality means that a simple count of patents is not a good proxy for invention.⁷ In addition, poor-quality patents are an undue obstacle to competition and a threat to innovation; an increase in the number of questionable patents is more indicative of the adverse economic outcomes posed by imperfect patent policies than



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See, e.g., Tom G. Palmer, "Are Patents and Copyrights Morally Justified? The Philosophy of Property Rights and Ideal Objects," Harvard Journal of Law and Public Policy 13:3 (Summer 1990), pp. 817-865. https://heinonline.org/HOL/LandingPage?handle=hein.journals/hjlpp13&div=50&id=&page.

^{3.} William M. Landes and Richard A. Posner, *The Economic Structure of Intellectual Property Law* (Belknap Press of Harvard University Press, 2003). https://www.hup. harvard.edu/catalog.php?isbn=9780674012042.

Bronwyn H. Hall, "Business and Financial Method Patents, Innovation, and Policy," National Bureau of Economic Research, April 2009. https://www.nber.org/ papers/w14868; Josh Lerner, "The Litigation of Financial Innovations," *The Journal of Law & Economics* 53:4 (November 2010), pp. 807-831. https://www.journals. uchicago.edu/doi/abs/10.1086/655757.

^{5.} Charles Duan, "Product Hopping: Federal and State Approaches," *R Street Policy Study* No. 227, March 2021. https://www.rstreet.org/wp-content/uploads/2021/03/Final-No.-227.pdf.

^{6.} Lauren Cohen et al., "The Growing Problem of Patent Trolling," Science 352:6285 (April 29, 2016), pp. 521-522. https://www.science.org/doi/10.1126/science. aad2686.

^{7.} See, e.g., Jeffrey Funk, "Beyond Patents," Issues in Science and Technology 34:4 (Summer 2018), pp. 48-54. https://issues.org/beyond-patents.



a measure of invention. It is important, therefore, that an institutional framework exist to assess the quality of patents issued while providing a cost-effective means for voiding invalid patents that do not support or incentivize invention.

The purpose of this paper is to examine both the origins and economics of patents. Although patents are commonly used by governments as a tool to promote innovation, the ways in which patent policy is implemented, the expanding use of patents and the economic tradeoffs inherent in government-granted monopolies concern economists. In addition to examining these concerns, this paper also explores proposals to improve the functioning of the patent system, particularly policies that address the problems generated by poor-quality or invalid patents.

Letters Patent: The Origin of Monopoly Privilege

Patents have had a colorful and contentious history tracing back more than 500 years. In 1474, Venice issued patents granting 10 years of exclusivity, with utility and novelty being important considerations.⁸ By all accounts, these early patents served the same purpose as today's patent system: to spur invention and promote innovation. In particular, the patents issued in Venice sought to attract skilled artisans and craftsmen to the flourishing city-state.

In contrast to those of Venice, patents issued in England gravitated toward government largesse, with rulers issuing patents for personal enrichment or to buy loyalty. Indeed, the concept of the patent comes from "letters patent," by which a ruler would grant privileges or appointments of various sorts, be it an official rank, land, a monopoly or a patent on invention.⁹ In late-16th-century England, the grant of privilege was abused considerably, and protected monopolies began to emerge with little correlation to innovation or industry. Large swathes of economic activity and everyday life were heavily regulated, with government-granted monopolies on everything from salt to vinegar to starch.¹⁰ In a perhaps extreme example, in 1582, the Crown provided a monopoly grant to William Harebrowne for the making of salt, "in part for the relief of the decayed fortunes of the Harebrownes attributable to losses at sea."¹¹

The rising economic burden and associated civil and political unrest of such practices eventually led to new restrictions on grants of monopoly privileges, as political momentum grew to eliminate some protected monopolies. At the start of the 17th century, a famous case, *Darcy v Allen*, challenged a monopoly granted over all playing cards marketed in England.¹² For the first time, a court ruled that a monopoly grant for private gain violated the common law and was economically harmful. Although this important historical ruling aimed to reduce the adverse welfare effects of monopolies, patent abuse continued under King James I, leading the Parliament to pass the Statute of Monopolies in 1623.¹³

Often referred to as the touchstone of Anglo-American patent law, the legislation had two key impacts on patents. First, the statute restricted the monarch's ability to



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8. Edith Tilton Penrose, The Economics of the International Patent System (The Johns Hopkins Press, 1951). https://books.google.com/books/about/The_Economics_ of_the_International_Paten.html?id=_79hAAAAMAAJ.

12. Darcy v. Allen, 77 Eng. Rep. 1260 (K.B.), 1603.

^{9.} Fritz Machlup, "An Economic Review of the Patent System," Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, U.S. Senate, 1958. https://www.google.com/books/edition/An_Economic_Review_of_the_Patent_System/Cz7bAAAAMAAJ?hl=en.

^{10.} Penrose, p. 6. https://books.google.com/books/about/The_Economics_of_the_International_Paten.html?id=_79hAAAAMAAJ.

^{11.} Ibid.

^{13. 1623 1} Jac 1 c 3.



grant abusive patents and nullified many of the monopolies granted by the Crown.¹⁴ Although this did not eliminate the potential for abuse, it did reduce royal patronage to some degree. Second, the Statute of Monopolies provided an exception that granted a "first and true" inventor a patent for a period of 14 years. In this regard, the statute returned the concept of a patent of invention to its original moorings: rewarding inventors for innovation. Importantly, it should be noted that the Statute of Monopolies provided no reference to patents as property rights imbued with the same protections as natural or tangible property. The statute made clear that patents were a vehicle for promoting innovation and rewarding inventors for their efforts.

The American Patent System: Promoting the Progress of Science and Useful Arts

Patent law in the United States draws heavily from its British origins. The Statute of Monopolies and English patent law were influential in America and helped shape what ultimately became the Patent Act. Given that American law primarily followed English common law traditions and English legal theory, the desire to promote invention through patent privilege was not a new idea, and it was widely accepted in the colonies. In fact, early on, many colonies would grant patents not just for invention but also for establishing industries that were known to be successful elsewhere.¹⁵

Yet the nation's founders typically viewed monopolies as problematic, and the broader application of patents was not included in the framing documents of the United States.¹⁶ Instead, Article I, Section 8 of the U.S. Constitution—often called the Progress Clause—grants Congress the authority "[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."¹⁷ This period of exclusive ownership provides an incentive to produce works that might otherwise not be undertaken; it does not, however, enshrine patents as property. The U.S. Constitution is, in fact, silent on this issue. Exclusivity is not identical or even analogous to the ownership of tangible or real property, given the many differences between them, which are discussed below. This exclusivity is, therefore, more aptly explained as a statutory monopoly privilege created by Congress under its constitutional mandate.

That statutory privilege was created in 1790 when Congress exercised its constitutional option to enact both copyright and patent laws granting creators and inventors limited monopolies on the works they produce.¹⁸ The Patent Act of 1790 provided inventors a "sole and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said invention or discovery."¹⁹ Many who view patents as equivalent to tangible property assert that this establishes a sort of natural right for ideas; however, the limited period of exclusivity established by statute is more suggestive of a government grant of monopoly privilege rather than a common law or natural right. As former U.S. Solicitor General Paul Clement notes:

Statute of Monopolies Passed In 1623

Often referred to as the touchstone of Anglo-American patent law, the Statute of Monopolies had two key impacts on patents.



^{14.} Petra Moser, "Patents and Innovation: Evidence from Economic History," Journal of Economic Perspectives 27:1 (Winter 2013), p. 24. https://www.aeaweb.org/ articles?id=10.1257/jep.27.1.23.

^{15.} Herbert Hovenkamp, "The Emergence of Classical American Patent Law," *Arizona Law Review* 58:263 (2016), pp. 263-306. https://arizonalawreview.org/pdf/58-2/58arizlrev263.pdf.

^{16.} Philip B. Kurland and Ralph Lerner, eds., *The Founders' Constitution* web edition (University of Chicago Press and the Liberty Fund), last accessed Oct. 28, 2022. http://press-pubs.uchicago.edu/founders/documents/v1ch14s46.html.

^{17.} U.S. Const. art. I, § 8, cl. 8.

^{18.} Robert P. Benko, Protecting Intellectual Property Rights: Issues and Controversies (American Enterprise Institute, 1987). https://www.google.com/books/edition/ Protecting_Intellectual_Property_Rights/q1YOAQAAMAAJ?hl=en.

^{19.} Patent Act of 1790, 1 Stat 190.



Patent rights can therefore be quite valuable in the hands of the inventor. Nevertheless, there was widespread consensus at the time of the Founding that patent rights and traditional property rights are fundamentally different. Indeed, there was virtually no disagreement that patent rights are not vested by nature or the common law; instead, they are creatures of positive law whose scope, contours, and very existence depend on the will of Congress. The rhetoric employed in some quarters today—describing patents as sacred rights of property on a par with natural or common law rights—would have been immediately dismissed by the Framers as profoundly mistaken.²⁰

The original Patent Act provided a term of 14 years, which was revised in 1836 to include a seven-year extension (the uniquely American examination system was also added at this point). In 1861, the extension was revoked, and a patent term of 17 years was established. This remained the law of the land until 1994, when the United States revised its patent term to 20 years from filing to bring the nation in line with global treaties on intellectual property.²¹

Patents: Privilege or Natural Property Right?

Although patents emerged as a grant of monopoly privilege defined in the Patent Act, one school of thought suggests that modern patent protections are better viewed as a tangible right more akin to a natural right rather than an exclusive

right granted by the government.²² Although the difference may appear semantic, it has considerable impact on the policy debate over patents. It is far easier to reform a system of government-granted monopolies than a system that professes to protect a natural right of inventors, and the metrics of success are different under the two paradigms. For this reason, many proponents of stronger patent laws have adopted a natural rights framework to make their case.²³

Importantly, the natural rights argument ignores the significant differences between physical and intellectual property, sidestepping the fundamental need to economically justify a system created specifically to preclude competition and market forces and ultimately disregarding the fundamental economic purpose of the patent system. As some economists have noted, "it is extraordinary how the Patent System goes on largely unchallenged, much as if it were some august political institution and not an economic device directed to a specific economic end."²⁴

Supporters of stronger patent laws have attempted to imbue intellectual property with the same inviolable rights as tangible, physical property. But important economic differences exist between the two that undermine the analogy as well as any argument that the law governing real property can or should be directly applied to intellectual property. Unlike real property, intellectual property is nonrivalrous, non-excludable and a creation of statutory law.²⁵ R Street Policy Study No. 270 November 2022



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^{20.} Paul Clement, "Patent Rights vs. Property: The Framers' Understanding of Patents," September 2009, p. 3. https://static.wixstatic.com/ug/ a0a494_53e5dd5e9ccd42899ffe45ec608f6b80.pdf.

Tyler Trent Ochoa, "Patent and Copyright Term Extension and the Constitution: A Historical Perspective," Journal of the Copyright Society of the U.S.A. 49 (2001), pp. 19-125. https://ssrn.com/abstract=2473392.

^{22.} Adam Mossoff, "Rethinking the Development of Patents: An Intellectual History, 1550-1800," *Hastings Law Journal* 52:6 (2001), pp. 1255-1322. https://repository.uchastings.edu/hasting

^{23.} Fritz Machlup and Edith Penrose, "The Patent Controversy in the Nineteenth Century," *The Journal of Economic History* 10:1 (May 1950), pp. 1-29. https://c4sif.org/wp-content/uploads/2010/09/Machlup-Penrose-The-Patent-Controversy-in-the-Nineteenth-Century-1950-b.pdf.

^{24.} John Jewkes, et al., The Sources of Invention (Palgrave Macmillan, 1969). https://link.springer.com/book/10.1007/978-1-349-00015-9.

^{25.} Arnold Plant, "The Economic Theory Concerning Patents for Inventions," Economica 1:1 (February 1934), p. 31. https://www.jstor.org/stable/2548573.



Artificial scarcity may support higher prices that create the incentives to invent, but it also imposes social costs in the form of a diminution in freedom, interference with market competition and the associated costs of dispute resolution and administrative oversight. Prominent economists have long cautioned against ignoring these relevant costs. Nobel economist Friedrich Hayek, for example, warned of the dangers of assuming a direct equivalence between tangible and intellectual property, noting the "mechanical extension of the property concept by lawyers has done so much to create undesirable and harmful privilege."²⁶

Even a strong advocate for intellectual property should agree that inappropriate or mistaken patent grants decrease the overall benefits of the patent system. Determining what is patentable, therefore, becomes an important question that the state must address. Similarly, in cases where patents were improperly granted for something that was not new or novel, a mechanism for eliminating such invalid patents must be available. While these are valuable—and arguably essential components of a patent system, they are less characteristic of tangible property.

The Global Expansion of Patent Policy

Irrespective of the various legal and economic issues surrounding patents, they became a prominent feature of the global economy in the 19th century. Manufacturers and owners of patents faced off against economists and free trade advocates, creating what has been termed the "19th-century patent controversy, and the expanding role of patents created new political interest groups representing those who reaped the benefits of the government-granted patent monopolies.²⁷

It also created a situation in which conflicting national patent laws made trade more challenging. As a result, many countries began pressing for a more uniform global system of patents; the United States, in particular, sought to resolve the problem of patent protection surrounding exhibitions and world's fairs (in 1873, the United States was a prominent advocate for the first international patent convention, held in Vienna, Austria).²⁸ With these circumstances in place, discourse developed on the merits of patents, leading to attempts to abolish patents altogether in some nations. In turn, this mobilized the political efforts of patentees, engineers and lawyers to counter the attacks on the patent system.

The debate between patent holders and free trade advocates first played out in Germany, where Otto von Bismark sought to unify the country. Some of the German states enforced patents, whereas others had no patent laws. Additionally, each state retained the right to prohibit the importation of goods from other states that infringed upon a local patent. The issue was ultimately resolved with the unification of Germany in 1871 and the passage of a national Patent Act in 1877, which Fritz Machlup and Edith Penrose view as a "victory of the allied forces of protectionism: the acceptance of the idea of protection of industry against competition from abroad as well as from domestic imitators."²⁹



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^{26.} F.A. Hayek, "'Free' Enterprise and Competitive Order," in *Individualism and Economic Order*, (University of Chicago Press, 1948), p. 114. https://www.degruyter. com/document/doi/10.7208/chicago/9780226781471-008/pdf.

^{27.} Machlup and Penrose. https://c4sif.org/wp-content/uploads/2010/09/Machlup-Penrose-The-Patent-Controversy-in-the-Nineteenth-Century-1950-b.pdf.

^{28.} B. Zorina Khan, "An Economic History of Patent Institutions," Economic History Association, EH.net, last accessed Oct. 28, 2022. https://eh.net/encyclopedia/aneconomic-history-of-patent-institutions.

^{29.} Machlup and Penrose. https://c4sif.org/wp-content/uploads/2010/09/Machlup-Penrose-The-Patent-Controversy-in-the-Nineteenth-Century-1950-b.pdf.



In addition to Germany, other nations across Europe faced the clash between free trade and patentee demands for protection. Many economists viewed patents as nontariff trade barriers that limited access to global markets and lowered overall trade. In fact, the Congress of German Economists issued a proclamation stating, "patents of invention are injurious to common welfare."³⁰ The debate generated a strong movement for the abolition of patents altogether in England and across the European continent. The movement's biggest success was in Holland, which repealed its patent laws in 1869. It was not until 1910 that the nation adopted a new patent system.³¹

The United States experienced its own patent controversies as well. An article printed in the *Scientific American* in 1858 bemoaned the fact that wealthy patentees were turning to Congress to seek extensions for their patents, noting that "[m]ost of the applicants were refused extensions on application at the Patent Office, for the reason that they could not show that they had not already reaped a rich reward from their patents," and going on to say that, "[o]thers have unsuccessfully besieged Congress, session after session, until their patents have long since expired, and now they have the audacity to ask Congress to renew them."³² This constant pressure to continue extending patents ultimately led to legislation in 1861 that established a longer initial 17-year patent term with no extensions.

Notwithstanding the heated debate over the role of patents, the 19th century closed with virtually all industrialized nations adopting patent laws that granted patentees an exclusive period of time to exploit the benefits of their inventions. For better or worse, patents are now an integral component of economic activity and global trade, despite the lack of definitive empirical evidence on the efficacy of the modern patent system. As Edith Penrose famously stated:

If national patent laws did not exist, it would be difficult to make a conclusive case for introducing them; but the fact that they do exist shifts burden of proof. And it's equally difficult to make a really conclusive case for abolishing them.³³

The Economic Nature of Innovation

For economists, the problem of monopoly privilege created by a patent is exacerbated by the nature of innovation. Unlike tangible property, ideas—the source of invention and innovation—are pure public goods in an economic sense.³⁴ Ideas are not rivalrous in consumption, meaning one person's use of an idea does not detract from another's use of the same idea. Additionally, ideas are non-excludable—once the idea is known, there is no way to stop others from using it (or, at least, it may be cost-prohibitive to do so). Ideas exist without any scarcity. One scholar noted that when someone complains about a stolen idea, he "complains that something has been stolen which he still possesses, and he wants back something which, if given to him a thousand times, would add nothing to his possession."³⁵

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- 30. Machlup, p. 4. https://www.google.com/books/edition/An_Economic_Review_of_the_Patent_System/Cz7bAAAAMAAJ?hl=en.
- 31. Penrose, p. 15. https://books.google.com/books/about/The_Economics_of_the_International_Paten.html?id=_79hAAAAMAAJ.
- 32. "Patent Extensions and Lobbyists in Congress," Scientific American 13:21 (January 1858), p. 165. https://www.scientificamerican.com/article/patent-extensionsand-lobbyists-in.
- 33. Penrose, p. 40. https://books.google.com/books/about/The_Economics_of_the_International_Paten.html?id=_79hAAAAMAAJ.

^{34.} Paul A. Samuelson, "The Pure Theory of Public Expenditure," *The Review of Economics and Statistics* 36:4 (November 1954), pp. 387-389. https://www.ses.unam. mx/docencia/2007II/Lecturas/Mod3_Samuelson.pdf.

^{35.} Machlup and Penrose, p. 16. https://c4sif.org/wp-content/uploads/2010/09/Machlup-Penrose-The-Patent-Controversy-in-the-Nineteenth-Century-1950-b.pdf.



The inability to recoup the benefits from providing what, for most purposes, behaves as a public good, suggests that these goods will be undersupplied by the market. Still, many economists have rejected the simplistic application of a property model to patent rights because it provides no insights on how best to design the system to maximize innovation. However, this does not mean that patents cannot be used to promote invention. As Fritz Machlup stated in his testimony to the Senate Judiciary Committee in 1958, "perhaps it is necessary to mention, though it ought to be commonplace, that the rejection of the notion of private property in ideas implies neither antagonism to the institution of private enterprise nor hostility to the patent system."³⁶ It is the role of the economist to assess the potential welfare effects of the structure and administration of the patent system—good or bad.

The question that economists debated is whether the incentives generated by patents outweighed the social costs of the monopoly that provided the incentive. Framing the discussion in terms of natural property rights does not address the issues that economists are interested in examining. As Hayek explains:

It seems to me beyond doubt that in these fields a slavish application of the concept of property as it has been developed for material things has done a great deal to foster the growth of monopoly and that here drastic reforms may be required if competition is to be made to work. In the field of industrial patents in particular we shall have seriously to examine whether the award of a monopoly privilege is really the most appropriate and effective form of reward for the kind of risk-bearing which investment in scientific research involves.³⁷

Even Milton Friedman, while ultimately supporting the role of patents as an incentive for innovation, worried that patents—particularly "trivial patents"—introduced distortions into the market that could adversely affect economic activity. He also made clear that patents were a matter of policy expediency, not a natural right, and personally preferred patents of a much shorter duration.³⁸

Patents and the Intellectual Commons

The incentive provided by a government-granted monopoly allows the inventor to prevent others from exploiting their invention for a fixed period of time. In exchange, the invention is publicly filed with the patent office, ultimately making it available to the larger public. For many, this public disclosure requirement justifies the temporary monopoly, as inventions that go off patent contribute to the intellectual commons and expand the publicly available pool of knowledge.

This grand bargain fulfills the constitutional mandate that Congress should establish patent policies that promote progress. As with all laws, however, the devil is in the details, and it is not intuitively obvious that current patent laws in the United States strike the appropriate balance between promoting innovation and protecting monopolists. There are, in fact, real concerns about how patent law is applied. At its core, a patent provides a right to exert control over the behavior of others. Unlike enforcing trespass against tangible property, enforcing a patent requires restricting the ability of other individuals to employ their own property to act on an idea they may have freely obtained through independent creation.³⁹ This is even more significant when considering simultaneous invention, where a patent grants only one entity the ability to exploit knowledge from a common pool of knowledge.

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^{36.} Machlup, p. 26. https://www.google.com/books/edition/An_Economic_Review_of_the_Patent_System/Cz7bAAAAMAAJ?hl=en.

^{37.} Hayek, pp. 113-114. https://www.degruyter.com/document/doi/10.7208/chicago/9780226781471-008/pdf.

^{38.} Milton Friedman, Capitalism and Freedom (University of Chicago Press, 1962). https://press.uchicago.edu/ucp/books/book/chicago/C/bo68666099.html.

^{39.} Mark A. Lemley, "The Myth of the Sole Inventor," Michigan Law Review 110:5 (2012), pp. 709-760. https://repository.law.umich.edu/mlr/vol110/iss5/1.



Patents are an institutional constraint on the flow of ideas; therefore, it is important to examine how patents can promote or deter economic growth. Drawing on the work of Elinor Ostrom, economists Eli Dourado and Alex Tabarrok suggest looking at intellectual property as a commons; as such, it is important to create an institutional framework that preserves and manages that commons.⁴⁰ Ostrom earned a Nobel Prize for her study of the commons and her understanding that with the proper institutional framework a commons can be managed without ending in tragedy.⁴¹ From fishing to water rights, commons have existed throughout history, successfully managed by an appropriate institutional framework.

From this perspective, patents are not a property right; rather, they are a tool used to promote and manage the intellectual commons. When used properly, the pool of knowledge expands, increasing innovation and economic growth. Thus, defining patentability, the scope of the patent and the duration of the patent are all factors that need to be evaluated when managing the intellectual commons.

Coupled with the explosive growth in patents over the last 50 years, the increase in poor-quality and unwarranted patents may have created what Michael A. Heller described as an "anticommons," or a situation in which there are so many overlapping rights to exclude that economic growth is deterred as new innovators find it too difficult to compete with legacy patent owners.⁴² This is especially true of cumulative innovation, where new inventions build upon previously patented products. One study found that patents were a problem for downstream innovation in particular industries, including computers, electronics and medical instruments.⁴³

Finally, evidence suggests that current practices do not always expand the knowledge pool. While a critical element of a patent is the public disclosure of the invention, studies suggest that required disclosures are often inadequate and obfuscated and do not contribute significantly to the diffusion of knowledge.⁴⁴ At the same time, poorly defined or low-quality patents can inhibit innovation by failing to carefully specify the patent's boundaries. Broad and poorly defined patents can limit future innovators who may have better ideas.⁴⁵

The Welfare Costs of Patents

It is not surprising that many economists have historically shared a skeptical view of patents; the potential social welfare loss associated with monopolies has long been a concern, and patents, by nature, are monopolistic. In some instances, patents can generate pure monopolies; in others, competitive substitutes may be available that limit the monopoly power of a patent. Either way, the period of exclusivity offered by a

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Broad and poorly defined patents can limit future innovators who may have better ideas.

40. Eli Dourado and Alex Tabarrok, "Public choice perspectives on intellectual property," *Public Choice* 163 (2015), pp. 129-151. https://link.springer.com/ article/10.1007/s11127-014-0195-x.

^{41.} Elinor Ostrom, Governing the Commons: The Evolution of Institutions for Collective Action (Cambridge University Press, 1990). https://www.cambridge.org/core/ books/governing-the-commons/A8BB63BC4A1433A50A3FB92EDBBB97D5.

Michael A. Heller, "The Tragedy of the Anticommons: Property in the Transition from Marx to Markets," *Harvard Law Review* 111:3 (January 1998), pp. 621-688. https://repository.law.umich.edu/cgi/viewcontent.cgi?article=1608&context=articles; James M. Buchanan and Yong J. Yoon, "Symmetric Tragedies: Commons and Anticommons," *Journal of Law and Economics* 43:1 (April 2000), pp. 1-13. https://www.amherst.edu/media/view/231571/original/ buchanan%2Byoon%2Banticommons.pdf.

^{43.} Alberto Galasso and Mark Schankerman, "Patents and Cumulative Innovation: Causal Evidence from the Courts," *The Quarterly Journal of Economics* 130:1 (February 2015), pp. 317-370. https://www.jstor.org/stable/26372601.

^{44.} Lisa Larrimore Ouellette, "Who reads patents?" Nature Biotechnology 35:5 (May 2017), pp. 421-424. https://www.nature.com/articles/nbt.3864.epdf?author_access_token=703bK7j9bUpN-n-OW70m5tRgN0jAjWel9jnR3ZoTv0Ol42P4vMJlBfepYMsqX2Z-k-LoLhf9gb8yDVFxKXiuWMq8f5NvBmLfr_0AFFOD0v0Rb8bY-TF3jGpkRjk3fnmp.

^{45.} Janet Freilich, "The Uninformed Topography of Patent Scope," *Stanford Technology Law Review* 19:150 (Fall 2015), pp. 150-195. https://law.stanford.edu/wp-content/uploads/2017/11/THE-UNINFORMED-TOPOGRAPHY-OF-PATENT-SCOPE.pdf.



patent is a limit on overall competition in the marketplace. The costs of monopoly power are well known to economists, dating back to the 19th-century work of Jules Dupuit and Alfred Marshall.⁴⁶ In 1954, Arnold Harberger developed a formal approach to the study of monopoly, highlighting the deadweight loss generated by the higher prices and restricted output of the monopolist. This loss in consumer welfare became known as the "Harberger triangle" based on its graphical exposition; summing these costs across the economy provided a measure of the welfare losses associated with monopoly.⁴⁷

Deadweight Loss

The deadweight loss (Harberger triangle) represents a reduction in consumer welfare due to higher prices and restricted output of a monopoly compared to a perfectly competitive market. Numerous studies have shown the adverse impacts of patents on prices and output. For example, one study of the pharmaceutical industry found that drug companies routinely file additional patents to extend the monopoly position and that, "[d]rugmakers filed more than 140 patent applications on average per drug; on average 66 percent of patent applications were filed after the FDA approved the drug to be on the market."⁴⁸ This means that these patents were focused more on extending market exclusivity than on innovation.

As the scope and reach of patents expand, so does the potential for adverse effects. For example, the extension of patents into clinical testing may have implications on the ability of researchers to explore and exploit research opportunities associated with the Human Genome Project. One study found that "patents and licenses have a significant negative effect on the ability of clinical laboratories to continue to perform already developed genetic tests."⁴⁹

Additionally, firms can create "patent thickets" by building a broad portfolio of patents on a single invention that makes it difficult for rivals to enter the market or to "patent around" an existing patent. "Evergreening" is also a popular tactic used by pharmaceutical companies to extend a drug's period of exclusivity by adding secondary or follow-on patents on aspects of the drug other than its active ingredient, such as delivery systems, dosages or packaging.⁵⁰ These secondary patents typically target ancillary characteristics of the drug rather than any innovation associated with the active ingredient. As a result, they are much weaker patents with a greater risk of invalidity due to obviousness. And while they often face challenges in court and eventually may be overturned, they can impose significant costs on patients and consumers before being invalidated. In one example, when the maker of the antidepressant drug Effexor added an extended-release version, Effexor-XR, the company received two additional patents, delaying market entry by lower-cost generic competitors. When challenged in court, the patent was declared invalid but "the cost to taxpayers of this delay is estimated at \$209 million."⁵¹

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Some Patents Focus on Extending Market Exclusivity, Not Innovations

"Drugmakers filed more than 140 patent applications on average per drug; on



of patent applications were filed after the FDA approved the drug to be on the market."

^{46.} Jules Dupuit, "On the measurement of the utility of public works," in *Readings in Welfare Economics* (Allen and Unwin, 1969), pp. 255-283. https:// competitionandappropriation.econ.ucla.edu/wp-content/uploads/sites/95/2016/08/On-the-Measurement-of-the-Utility-of-Public-Works-p.-255-283.pdf; Alfred Marshall, *Principles of Economics* (Macmillan, 1890). https://www.econlib.org/library/Marshall/marP.html?chapter_num=1#book-reader.

^{47.} Arnold C. Harberger, "Monopoly and Resource Allocation," *American Economic Review* 44:2 (May 1954), pp. 77-87. http://econdse.org/wp-content/uploads/2011/12/Harberger1954-Monopoly-and-resource-allocation-AER.pdf.

^{48. &}quot;Overpatented, Overpriced—Curbing patent abuse: Tackling the root of the drug pricing crisis," I-MAK, September 2022. https://www.i-mak.org/wp-content/ uploads/2022/09/Overpatented-Overpriced-2022-FINAL.pdf.

^{49.} Mildred K. Cho, et al., "Effects of Patents and Licenses on the Provision of Clinical Genetic Testing Services," *The Journal of Molecular Diagnostics* 5:1 (February 2003), pp. 3-8. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1907368.

^{50.} Erin H. Ward et al., "Drug Prices: The Role of Patents and Regulatory Exclusivities," Congressional Research Service, Feb. 10, 2021. https://crsreports.congress.gov/ product/pdf/R/R46679.

^{51.} Hazel Moir and Deborah Gleeson, "Explainer: evergreening and how big pharma keeps drug prices high," *The Conversation*, Nov. 5, 2014. https://theconversation. com/explainer-evergreening-and-how-big-pharma-keeps-drug-prices-high-33623.



Product-hopping is another practice used by drug manufacturers wherein they develop a new formulation of an existing drug—often a best seller—and then work to transition (or "hop") the market from the previous formulation to the new formulation.⁵² By encouraging doctors, pharmacists and patients to switch to a new formulation, such as a twice-day dosage instead of a once-daily pill, pharmaceutical companies can disrupt generic competition and continue to impose significant costs on consumers.⁵³ One study found that product hopping on just five popular drugs cost the U.S. healthcare system \$4.7 billion per year.⁵⁴ This has become a feasible strategy for extending patents because of the U.S. Patent and Trademark Office's (USPTO) acceptance of follow-on patents that are significantly weaker than the initial patent.

Rent-Seeking, Public Choice and the Patent System

Public choice is a field of study that applies the tools of economics to the functioning of government and other nonmarket institutions.⁵⁵ Founded by James Buchanan and Gordon Tullock, public choice has been labeled "politics without romance" for its use of formal tools to analyze the behavior of government actors rather than assuming an idealized normative view of government.⁵⁶ Just as in a market, individuals are viewed as self-interested utility maximizers; the difference, however, is that they maximize subject to different institutional constraints. As a result, behavior and outcomes in the public sector may differ from the private sector. Public choice economists analyze the behavior of politicians, regulators and bureaucrats as well as the institutional framework in which they operate. The statutory origins and nature of patents lend themselves well to a public choice analysis of the interest groups and political pressures that have shaped the contours of patent policy.

While the goal of the patent system is to promote innovation and ultimately expand the pool of knowledge, monopoly rents create incentives to extend the period of the patentee's exclusivity. Gordon Tullock expanded the study of monopoly to include rentseeking costs as companies turn to the government to pursue or protect monopoly profits.⁵⁷ Companies expend resources on rent-seeking to secure governmentprotected monopolies and will then continue to spend resources to protect that monopoly over time.⁵⁸

Indeed, establishing the U.S. Court of Appeals for the Federal Circuit in 1982 with nationwide jurisdiction over patent appeals demonstrates the power of political interest groups within the U.S. patent system.⁵⁹ The Court of Appeals for the Federal Circuit replaced regional courts with one consolidated jurisdiction for patent appeals. As Dourado and Tabarrok note, "[a]lthough the academic discussion of the bill [that created the Federal Circuit] often was framed in terms of the need to create certainty and uniformity, the support for the bill came from those who wanted patent law to be certain, uniform, and strong."⁶⁰

- 52. Duan. https://www.rstreet.org/wp-content/uploads/2021/03/Final-No.-227.pdf.
- 53. Ibid.

- 55. William F. Shughart II, "Public Choice," *The Library of Economics and Liberty*, last accessed Oct. 28, 2022. https://www.econlib.org/library/Enc/PublicChoice.html.
- James M. Buchanan, "Politics Without Romance," Policy 19:3 (Spring 2003), pp. 13-18. https://www.cis.org.au/wp-content/uploads/2015/04/images/stories/policymagazine/2003-spring/2003-19-3-james-m-buchanan.pdf.
- 57. Gordon Tullock, "The Welfare Costs of Tariffs, Monopolies, and Theft," *Economic Inquiry* 5:3 (June 1967), pp. 224-232. https://onlinelibrary.wiley.com/ toc/14657295/1967/5/3.
- 58. Fred S. McChesney, "Rent Extraction and Rent Creation in the Economic Theory of Regulation," *The Journal of Legal Studies* 16:1 (January 1987), pp. 101-118. https://www.journals.uchicago.edu/doi/abs/10.1086/467825.
- 59. "Public Law 97-164," Congress.gov, April 2, 1982. https://www.congress.gov/bill/97th-congress/house-bill/4482/text.
- 60. Dourado and Tabarrok, p. 136. https://link.springer.com/article/10.1007/s11127-014-0195-x.



One study found that producthopping on just five popular drugs cost the U.S. healthcare system



^{54.} Alex Brill, "The Price of Brand Drug Product Hopping," Matrix Global Advisors, September 2020. https://www.affordableprescriptiondrugs.org/app/ uploads/2020/09/CostofProductHoppingSept2020-1.pdf.



Thus, the patent bar, corporations and others that were vested in the patent system, worked to shape the infrastructure underlying today's patent system. As Landes and Posner have pointed out, "[t]he Federal Circuit has indeed turned out to be a pro patent court in comparison to the average of the regional courts that it displaced in the patent domain."⁶¹ In fact, after the creation of the Court of Appeals for the Federal Circuit, patent owners were three times more likely to win an appeal of a lower court's ruling of invalidity.⁶²

Advocates for strong patents are well known for flexing their power in the legislature. One study of lobbying expenditures between 1999 and 2018 ranked the pharmaceutical industry as the highest spender on lobbying, having spent \$4.7 billion in that time. This accounts for 7.3 percent of all lobbying over the last 20 years.⁶³ While pharmaceutical companies lobby on a variety of issues, supporting a strong patent system is a key concern for the industry, which continues to maintain a strong political presence.⁶⁴

Public choice analysis also can be applied to the functioning of the USPTO. Unlike tangible property, patents are created by a federal agency with over 14,000 employees.⁶⁵ Understanding the incentives and institutions of USPTO bureaucracy can provide insights into the efficacy of patent policy and possible impacts on patent quality.

Fortunately, some researchers have begun to conduct such analyses. Michael D. Frakes and Melissa F. Wasserman have explored the institutional structure of the USPTO and the incentives facing patent examiners. They noted that the USPTO subsidizes examination using renewal fees that are not recouped until years after a patent is granted. Because the fees collected for issuing patents and trademarks fund the agency, a denial represents a net financial loss for the USPTO, whereas a patent grant creates the prospect for future revenue collection. So, in tight fiscal times, potential incentives exist to overgrant patents, which generates fees while easing the burden on examiners. Their research corroborates this hypothesis:

We find evidence that the PTO is indeed overgranting patents during times in which the Agency lacks sufficient resources to meet its expected demand for examination. Moreover... the PTO is preferentially granting those patents it stands to benefit the most from—those in high continuation-filing-rate technologies, such as information and communication technologies, which include software, business methods, and information storage, and health-related technologies, which include surgical and medical instruments and genetics.⁶⁶

As the authors note, this helps explain why too many invalid patents are issued and also highlights a bias among examiners for overgranting patents. This is consistent with other research that finds that examiners are often time-constrained and have incentives to approve patents and leave it to the courts to weed the invalid patents later.⁶⁷



After the creation of the Court of Appeals for the Federal Circuit, patent owners were three times more likely to win an appeal of a lower court's ruling of invalidity.

^{61.} Landes and Posner, p. 335. https://www.hup.harvard.edu/catalog.php?isbn=9780674012042.

^{62.} Matthew D. Henry and John L. Turner, "The Court of Appeals for the Federal Circuit's Impact on Patent Litigation," *The Journal of Legal Studies* 35:1 (January 2006), pp. 85-117. https://www.jstor.org/stable/10.1086/498834.

^{63.} Olivier J. Wouters, "Lobbying Expenditures and Campaign Contributions by the Pharmaceutical and Health Product Industry in the United States, 1999-2018," JAMA Internal Medicine 180:5 (May 2020), pp. 688-697. https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2762509.

^{64.} Lisa Larrimore Ouellette, "How Many Patents Does It Take to Make a Drug - Follow-On Pharmaceutical Patents and University Licensing," *Michigan Telecommunications and Technology Law Review* 17:1 (2010), pp. 299-336. http://repository.law.umich.edu/mttlr/vol17/iss1/7.

^{65. &}quot;Fiscal Year 2023: The President's Budget and Congressional Justification," U.S. Patent and Trademark Office, March 2022. https://www.commerce.gov/sites/ default/files/2022-03/FY2023-USPTO-Congressional-Budget-Submission.pdf.

^{66.} Michael D. Frakes and Melissa F. Wasserman, "Does the U.S. Patent and Trademark Office Grant Too Many Bad Patents?: Evidence from a Quasi-Experiment," Stanford Law Review 67:3 (March 2015), pp. 617-676. https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=6324&context=faculty_scholarship.

^{67.} William F. Shugart II and Diana W. Thomas, "Intellectual Property Rights, Public Choice, Networks, and the New Age of Informal IP Regimes," Supreme Court Economic Review 23 (2015), pp. 169-192. https://www.journals.uchicago.edu/doi/10.1086/686477.



Others have demonstrated that the behavior of patent examiners can have an impact on patent litigation as well, finding that PAEs "overwhelmingly purchase patents granted by 'lenient' examiners," and positing that examiner effects can have a substantial impact on the behavior of PAEs and litigation more broadly.⁶⁸ These researchers have suggested that PAEs emerged to exploit the existence of lenient examiners, and they recommended investing more resources in examiners to address such concerns, which exist independently of patent law itself.⁶⁹

Still others have taken the analysis of incentives even further, examining patent approvals through a stark lens of self-interest. Specifically, one study finds that, "[m]any agency employees join the very firms whose patent applications they previously examined and appear to treat the applications from these firms differently, e.g., by granting them more patents than they grant to other firms."⁷⁰ Although the study authors acknowledge that these findings alone are not proof of rent-seeking behavior, they argue that "the preponderance of other evidence here points towards regulatory capture."⁷¹

Ultimately, when evaluating the efficiency of patent policies in the United States, the administrative costs of the patent system must be included in the analysis. This includes not only budgetary impacts of the USPTO but also the economic consequences of how this agency applies patent laws. There are real consequences to the decisions made by patent examiners and the policy guidance provided to examiners. Unlike tangible property, the value of patents is driven by a large administrative framework that oversees and implements patent policy.

X-Inefficiency and Patents

In the mid-20th century, Harvey Leibenstein introduced the concept of x-inefficiency, in which the absence of competitive pressure reduces a firm's overall efficiency and productivity.⁷² Monopolists have reduced incentives to control costs or operate at an economically efficient level.⁷³ Absent competition, firms are less efficient, and average costs will tend to rise.⁷⁴ In an assessment of the impact of patent policy on competitiveness, one legal scholar explains that the current patent system undermines the nation's competitive advantage by restraining domestic rivalry, noting that "[i]ntense domestic rivalry generally promotes competitive advantage because it drives firms to improve, to reduce intrafirm inefficiencies, and to develop more advanced factors of production."⁷⁵ This scholar also suggests that patents should be limited because enhancing domestic rivalry would encourage domestic economic growth as well as the relative competitiveness of U.S. firms in a global market.

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Absent competition, firms are less efficient, and average costs will tend to rise.

 Josh Feng and Xavier Jaravel, "Crafting Intellectual Property Rights: Implications for Patent Assertion Entities, Litigation, and Innovation," American Economic Journal: Applied Economics 12:1 (2020), pp. 140-181. https://pubs.aeaweb.org/doi/pdfplus/10.1257/app.20180361.

- Haris Tabakovic and Thomas G. Wollmann, "From Revolving Doors to Regulatory Capture? Evidence from Patent Examiners," National Bureau of Economic Research, May 2018. http://www.nber.org/papers/w24638.
- 71. Ibid.
- Harvey Leibenstein, "Allocative Efficiency vs. X-Efficiency," *The American Economic Review* 56:3 (June 1966), pp. 392-415. https://www.jstor.org/stable/1823775; M.A. Crew and C.K. Rowley, "On Allocative Efficiency, X-Efficiency and the Measurement of Welfare Loss," *Economica* 38:150 (May 1971), pp. 199-203. https://www.jstor.org/stable/2552579.
- 73. Liebenstein. https://www.jstor.org/stable/1823775.

75. William Hubbard, "The Competitive Advantage of Weak Patents," Boston College Law Review 54:5 (2013), pp. 1909-1965. https://scholarworks.law.ubalt.edu/cgi/ viewcontent.cgi?article=1041&context=all_fac.

^{69.} Ibid.

^{74.} Michael A. Crew and Charles K. Rowley, "Toward a Public Choice Theory of Monopoly Regulation," Public Choice 57:1 (April 1988), pp. 49-67. https://link.springer. com/article/10.1007/BF00052260.



Patents, Productivity and Economic Growth

Economist Paul Romer's model of growth endogenized technological innovation and highlighted the importance of ideas for boosting productivity and expanding economic output.⁷⁶ As noted previously, ideas *per se* are non-rivalrous and non-excludable. Yet the patent system, as an institution, establishes excludability, ideally to provide incentives for entrepreneurs and inventors. Not all economists, however, agree that the current patent system optimizes innovation and growth. Michele Boldrin and David K. Levine, for example, find "[n]o empirical evidence that patents serve to increase innovation and productivity (unless productivity is identified with the number of patents awarded). But no correlation exists between patents and measured productivity."⁷⁷

The sheer number of patents issued in recent years demonstrates the disconnect between patents and productivity. In recent years, the patent office has been approving about 300,000 patents annually, and in June 2018, the director of the USPTO celebrated the 10 millionth patent granted in the United States.⁷⁸ Just three years later, another million patents had been issued, as patent No. 11,000,000 was granted for a "utility patent that provides a new method for delivering, positioning, and/or repositioning a collapsible and expandable stent frame within a patient's heart chamber."⁷⁹

A closer examination of the data finds that the number of patents granted in the United States has been increasing over time, with a notable spike in the 21st century (Figure 1).⁸⁰ As one expert notes, "[a]lthough the count has been going for 182 years, one-half of the patents have been issued over the past 30 years."⁸¹ Although recent patent grants far exceed the number of patents issued annually in years prior, there is not a corresponding uptick in economic growth. In fact, the explosion in patents issued correlates closely to what economist Tyler Cowen refers to as the great stagnation—the drop in the U.S. growth rate that started in the early 1970s.⁸²

In other words, the rapid increase in the number of patents has not translated into a significant boost in innovation leading to greater economic growth. Indeed, a recent study concluded that "given the limitations of the existing literature," there is still "essentially no credible empirical evidence on the seemingly simple question of whether stronger patent rights [...] encourage research investments into developing new technologies."⁸³



The sheer number of patents issued in recent years demonstrates the disconnect between patents and productivity.

76. Paul M. Romer, "Endogenous Technological Change," Journal of Political Economy, 98:5 (October 1990), pp. S71-S102. https://www.jstor.org/stable/2937632.

^{77.} Michele Boldrin and David K. Levine, "The Case Against Patents," *The Journal of Economic Perspectives* 27:1 (Winter 2013), pp. 3-22. http://www.jstor.org/stable/41825459.

^{78. &}quot;United States Issues Patent Number 10,000,000," United States Patent and Trademark Office, June 19, 2018. https://www.uspto.gov/about-us/news-updates/ united-states-issues-patent-number-10000000.

^{79. &}quot;USPTO issues patent number 11,000,000," United States Patent and Trademark Office, May 11, 2021. https://www.uspto.gov/about-us/news-updates/usptoissues-patent-number-11000000.

^{80. &}quot;U.S. Patent Activity: Calendar Years 1790 to the Present," United States Patent and Trademark Office, last accessed Nov. 9, 2022. https://www.uspto.gov/web/ offices/ac/ido/oeip/taf/h_counts.htm.

^{81.} Dennis Crouch, "U.S. Patent No. 10,000,000," Patently0, June 19, 2018. https://patently0.com/patent/2018/06/patent-no-10000000.html.

^{82.} Tyler Cowen, The Great Stagnation: How America Ate All the Low-Hanging Fruit of Modern History, Got Sick, and Will (Eventually) Feel Better (Dutton Press, 2011). https://www.amazon.com/Great-Stagnation-Low-Hanging-Eventually-eSpecial-ebook/dp/B004H0M8QS.

Heidi L. Williams, "How do patents affect research investments?," Annual Review of Economics 9:1 (August 2017), pp. 441-469. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5664960.



400.000

Figure 1: Number of Utility Patents Granted by the USPTO (1790 to 2020)

Source: "U.S. Patent Activity: Calendar Years 1790 to the Present," United States Patent and Trademark Office, last accessed Nov. 9, 2022. https://www.uspto.gov/ web/offices/ac/ido/oeip/ taf/h_counts.htm.

	350,000	
	300,000	
Granted	250,000	
Utility Patents (200,000	
	150,000	
	100,000	
	50,000	
	0	

1790 | 1800 | 1810 | 1820 | 1830 | 1840 | 1850 | 1860 | 1870 | 1860 | 1890 | 1900 | 1900 | 1900 | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 | 2010 | 2010 | 2020 | 1795 1805 1815 1825 1835 1845 1855 1865 1875 1885 1895 1905 1915 1925 1935 1945 1955 1965 1975 1985 1995 2005 2015

This suggests two things: (1) the quality of many patents is poor and/or (2) the massive increase in patents is contributing to an "anticommons" that makes it more difficult for true inventors to enter the market. Existing data supports both hypotheses. The rapid increase in the number of business method patents, for example, has been seen as a detriment to innovation because such patents are overly broad and poorly defined; these patents raised real barriers to entry for new innovators.⁸⁴ Other economists have examined the problems of an anticommons created by the excessive rate of patenting. In this case, the ever-increasing web of patent rights makes it harder for inventors to navigate through existing patent rights to bring new products to market.⁸⁵

Incentives to Innovate: Patents, Prizes and Profit

Challenges posed by the formal patent system have led many to suggest that other mechanisms for rewarding innovation may yield more efficient outcomes. Some have raised the issue of whether patents are needed to spur entrepreneurs into action. As some have noted, "although every patent presumably involves an invention, not every invention involves a patent."⁸⁶ Competition, the driving force of the marketplace, spurs innovation simply because every business is trying to stay one step ahead of its competitors. This means innovating—creating new products to better satisfy consumer wants or finding ways to lower production costs for existing goods in the market. In fact, according to survey data from the late 20th century, "commercial research and development labs in most industries deem alternative mechanisms, such as secrecy and lead-time (being the first firm to offer a new product) to be more effective than patents."⁸⁷

Perhaps the most powerful reward for innovation is the first-mover advantage, which explains much of the rivalry in a typical market. Being the first to provide a new good or service provides a lucrative temporary monopoly. Although profits will eventually dissipate as competitors enter the market, the first-mover advantage allows for the constant innovation required to stay one step ahead of rivals. As economist Jack "[C]ommercial research and development labs in most industries deem alternative mechanisms, such as secrecy and lead-time (being the first firm to offer a new product) to be more effective than patents."

86. Jewkes et al. https://link.springer.com/book/10.1007/978-1-349-00015-9.

87. Moser. https://www.aeaweb.org/articles?id=10.1257/jep.27.1.23.

Richard S. Bradstreet, "United States v Business Method Patents: Trial by Trial and Error," Journal of Intellectual Property Law & Practice 8:5 (May 1, 2013), pp. 374-382. https://academic.oup.com/jiplp/article-abstract/8/5/374/843915?redirectedFrom=PDF.

Michael A. Heller and Rebecca S. Eisenberg, "Can Patents Deter Innovation? The Anticommons in Biomedical Research," Science 280:5364 (May 1, 1998), pp. 698-701. http://www.jstor.org/stable/2895332.



Hirshleifer noted, the pecuniary returns to those who first acquire information can offset the fact that new ideas are not excludable and therefore undersupplied: "Even though practical considerations limit the effective scale and consequent impact of speculation and/or resale, the gains thus achievable eliminate any a priori anticipation of underinvestment in the generation of new technological knowledge."⁸⁸

Indeed, a considerable amount of economic activity occurs without patents, either due to the high costs of filing and enforcing a patent or because alternative methods are used to protect the rents of invention. One common method is trade secrets, whereby innovators take measures to limit the diffusion of their technology. Coca-Cola, for example, notoriously guards the recipe of its original soft drink. In addition, informal institutions have emerged to protect invention in intellectual property's "negative spaces"—places where the industry remains dynamic and innovative despite a lack of formal protective mechanisms. These include, among others, fashion, cuisine, comedy and magic.⁸⁹ For example, without formal patent protection (which would require the patent holder to disclose too much information as part of the filing), magicians rely on an unwritten, norm-based code against plagiarism or the theft of ideas.⁹⁰

Historically, another popular approach to innovation has been the use of monetary prizes to reward inventors who solve specific challenges. Most famously, a prize offered by the British government helped solve the problem of measuring longitude.⁹¹ Prizes have the benefit of being easy to organize and can attract inventors from around the globe. Prizes can also generate innovation in areas that may not be commercially rewarding, which could be useful when addressing public health and other issues where the social return may be greater than the individual return.⁹² Both governments and private organizations continue to use prizes to address various technological challenges. While prizes can be effective in targeting specific issues, they rely on a centralized approach to innovation. Patents, on the other hand, enlist a much more decentralized strategy for invention, creating incentives for bottom-up invention that allows more ideas to flourish.

Additionally, a stronger education system that places more emphasis on science, technology, engineering and math can help create the next generation of inventors. Governments play a key role in this regard, as they invest heavily in research and development (R&D), providing grants and support to industry and universities that also promote progress in the useful arts and science. In fact, one study found that every \$10 million spent by the National Institutes of Health leads to an additional 2.3 patents.⁹³

In summary, innovation policy is a complex topic, and patents are but one tool for promoting invention. Given the challenges of creating and implementing a concrete definition of invention, patents will remain a topic of debate. Both the private and public sectors have additional avenues for promoting innovation, and it is important to assess patents from this broader perspective. Any economic justification for patents

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A considerable amount of economic activity occurs without patents, either due to the high costs of filing and enforcing a patent or because alternative methods are used to protect the rents of invention.

Jack Hirshleifer, "The Private and Social Value of Information and the Reward to Inventive Activity," *The American Economic Review* 61:4 (September 1971), pp. 561-574. https://www.jstor.org/stable/1811850.

Elizabeth Rosenblatt, "A Theory of IP's Negative Space," *Columbia Journal of Law & the Arts* 34:3 (Aug. 24, 2011). https://ssrn.com/abstract=1662661.
 Jacob Loshin, "Secrets Revealed: Protecting Magicians' Intellectual Property without Law," in Christine A. Corcos, ed., *Law and Magic: A Collection of Essays*

⁽Carolina Academic Press, 2010), pp. 123-142. https://www.cap-press.com/pdf/1778.pdf.
91. Joan Dash, *The Longitude Prize* (Farrar, Straus and Giroux [BYR], Oct. 13, 2000). https://www.google.com/books/edition/The_Longitude_Prize bX7hAAAAMAAJ?hl=en.

^{92.} Joseph E. Stiglitz, "Prizes, Not Patents," Project Syndicate, March 6, 2007. https://www.project-syndicate.org/commentary/prizes--not-patents.

^{93.} Pierre Azoulay et al., "Public R&D Investments and Private-sector Patenting: Evidence from NIH Funding Rules," *The Review of Economic Studies* 86:1 (January 2019), pp. 117-152. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6818650.



must balance possible benefits with the welfare costs of patent policy. This suggests that policy should proceed with care, setting high standards for awarding patents that justify the costs. The political economy and public choice problems of the patent system contribute to an increasing number of U.S. patents, with over 388,000 granted in 2020 alone.⁹⁴ Given the ambiguous relationship between patents and productivity, as well as the considerable costs of the current patent system, it may be worth reviewing existing patent policies to identify opportunities to improve outcomes and bolster economic growth, which is the focus of the next section.

Reforming the Patent Process

In the United States, patent enforcement is primarily done through private legal action. Historically, the courts have navigated the muddled world between monopoly protection and incentives for invention, providing a "loose joint" that allows judges to balance the interests of consumers and inventors in a constantly changing world. As Zorina Khan explains:

The laws were enforced by a judiciary which was willing to grapple with difficult questions such as the extent to which a democratic and market-oriented political economy was consistent with exclusive rights. Courts explicitly attempted to implement decisions that promoted economic growth and social welfare.⁹⁵

By the 2000s, however, concerns began to emerge over the growing number of invalid and unwarranted patents and the increase in patent litigation. As noted in a National Research Council study, "[b]eginning in 1980 a series of legislative actions, judicial decisions, executive branch initiatives, and international agreements largely spearheaded by the United States ostensibly strengthened the rights of intellectual property owners and extended intellectual property rights (IPRs) into new areas of technology."⁹⁶ This led to a substantial increase in the number of patents issued by the USPTO. In 1980, 66,170 patents were granted; that annual number reached 175,979 by the year 2000, and, today, there are more the 300,000 patents granted each year.⁹⁷

Under the current system, risks are asymmetric, with a bias that favors the patentee, beginning with the filing process. Upon application, the patentee's application is assumed valid; the burden is on the examiner to identify the prior art that would lead to the rejection of the patent, as is the cost of rejecting the patent. To invalidate a patent, the examiner must review prior art and demonstrate that the patent is not novel or non-obvious.

Considering the fact that the USPTO received over 600,000 patent applications in 2020, the examiner's job is particularly daunting and subject to significant time constraints.⁹⁸ Coupled with the fee structure discussed earlier and the USPTO's need to generate post-grant revenue, the incentive structure suggests an institutional bias toward over-patenting, which can hamper innovation through the introduction of invalid patents that raise costs for new inventors trying to navigate the existing system to bring new inventions and products to market.



Given the ambiguous relationship between patents and productivity, it may be worth reviewing existing patent policies to identify opportunities to improve outcomes and bolster economic growth.

95. Khan. https://eh.net/encyclopedia/an-economic-history-of-patent-institutions.

- 97. "U.S. Patent Statistics Chart Calendar Years 1963 2020." https://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm.
- 98. Ibid.

^{94. &}quot;U.S. Patent Statistics Chart Calendar Years 1963 – 2020," United States Patent and Trademark Office, last accessed Oct. 28. 2022. https://www.uspto.gov/web/ offices/ac/ido/oeip/taf/us_stat.htm.

^{96.} National Research Council, "A Patent System for the 21st Century," (The National Academies Press, 2004). https://www.nationalacademies.org/our-work/a-patent-system-for-the-21st-century.



These problems have worsened as the surge in patents has been paralleled by increasing litigation, driven to a large extent by the rise of NPEs that emerged to exploit the weaknesses of the system. (While the terms NPE and PAE are often used interchangeably, the term PAE more accurately describes entities exclusively engaged in patent assertion litigation.) Such entities rely solely on litigation or the threat of litigation to generate revenue, primarily by targeting cash-flush firms.⁹⁹ Not only does this significantly increase the administrative costs of the patent system, but it also poses a threat to true innovation by exposing potential inventors to questionable legal threats of infringement. Moreover, evidence suggests that such entities act opportunistically; for example, targeting firms with limited resources to defend themselves and forum shopping for favorable venues.¹⁰⁰ In fact, a 2016 study found that more than 40 percent of litigation by such entities was in one jurisdiction: the Eastern District of Texas—a venue know to favor patent owners.¹⁰¹

Litigious activity by PAEs adversely affects innovation. One study reported that, each year, battling PAE lawsuits results in \$29 billion in expenditures and, in aggregate, "destroys over \$60 billion in firm wealth." Furthermore, the burden is borne by innovative firms compelled to shift expenditures from innovation to litigation.¹⁰² Perhaps in response to the increase in patent litigation, the Supreme Court turned its attention to patent law, hearing a disproportionate number of patent cases relative to its overall caseload over the last decade.¹⁰³ The Court's decisions have addressed some of the key issues underlying the increase in litigation, with a particular emphasis on patent eligibility. While beyond the scope of this paper, the Court, through a series of decisions, attempted to reaffirm the prohibition on patenting abstract ideas, while proposing a new test to ensure that patents were limited to advances in technology that were distinct from abstract ideas.¹⁰⁴

The America Invents Act

Congress also moved to address problems emerging in patent law. In 2011, Congress passed the America Invents Act (AIA), which made fundamental changes to the patent system. Perhaps most importantly, the AIA established new administrative procedures at the USPTO as an alternative to costly and lengthy adjudication.¹⁰⁵ The AIA reconstituted an existing adjudicatory body and renamed it the Patent Trial and Appeal Board (PTAB), where anyone could petition the validity of a patent. Rather than a jury trial, PTAB trials are heard by a panel of administrative patent judges with the technical background and expertise to adjudicate complex patent cases. The AIA created three specific categories of review: post-grant review that can be filed within the first nine months of a patent issuing; a transitory review of covered business method patents (that has since expired); and inter partes review (IPR) proceeding, which allows anyone to petition the PTAB to review the validity of a patent. The IPR has been the most prevalent review requested, perhaps because it is expected to take only 12 to 18

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\$60 billion in wealth" annually.

100. Ibid.

^{99.} Lauren Cohen et al., "Patent Trolls: Evidence from Targeted Firms," Harvard Business School Finance Working Paper No. 15-002 (June 8, 2018). http://dx.doi. org/10.2139/ssrn.2464303.

^{101.} Cohen et al., "The growing problem of patent trolling." https://www.science.org/doi/10.1126/science.aad2686?cookieSet=1.

^{102.} James Bessen, "The Evidence Is In: Patent Trolls Do Hurt Innovation," Harvard Business Review (November 2014). https://hbr.org/2014/07/the-evidence-is-in-patent-trolls-do-hurt-innovation.

^{103.} Joseph S. Miller, "Charting Supreme Court Patent Law, Near and Far," *Chicago Kent Journal of Intellectual Property* 17:2 (2018), pp 377-404. https://digitalcommons. law.uga.edu/fac_artchop/1237.

^{104.} Colleen V. Chien and Jiun Ying Wu, "Decoding Patentable Subject Matter," Patently-O Patent Law Journal 1 (Oct. 16, 2018). https://papers.ssrn.com/sol3/papers. cfm?abstract_id=3267742.

^{105. &}quot;Public Law 112-29," Congress.gov, Sept. 16, 2011. https://www.congress.gov/bill/112th-congress/house-bill/1249.



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months, start to finish, at a cost well below the costs of a traditional legal challenge.¹⁰⁶ The PTAB provides an alternative dispute-resolution mechanism for challenges brought by PAEs, which in 2018 accounted for 47 percent of all patent litigation.¹⁰⁷

As designed, IPR proceedings do not focus on companies with strong primary patents; the impact is on invalid and poorly defined patents and frivolous lawsuits. In fact, USPTO data suggests that the IPR process affects a relatively small number of patents. There were over 3.8 million patents in existence in 2021, and, that year, the USPTO issued almost 400,000 more. Yet only 1,193 claims were challenged at the USPTO and only 111 of those lost on all claims in the patent—meaning that roughly 0.00029 percent of all patents lost on all claims (Figure 2). In this respect, the IPR process proved to be an effective tool to expunge invalid patents, which, unfortunately, do find their way into the system, while posing little threat to the vast majority of patents.¹⁰⁸

Figure 2: All Patents, Fiscal Year 2020

Source: "PTAB Trial Statistics, FY2020 End of Year Outcome Roundup, IPR, PGR, CBM," United States Patent and Trademark Office, last accessed Oct. 28, 2022. https://www.uspto.gov/ sites/default/files/documents/ ptab_aia_fy2020_roundup.pdf.



Moreover, data shows that the IPR process is a fair procedure for evaluating the validity of patents. The USPTO's validity findings in IPR are affirmed in the federal courts 85 percent of the time, suggesting that IPR proceedings provide outcomes similar to more traditional legal proceedings for challenging patents.¹⁰⁹ And several studies have examined the costs savings and benefits of the IPR system that Congress created. The median cost of an IPR proceeding was found to be about \$350,000 through the appeals phase, compared to \$3.1 million to bring a case to trial in a district court.¹¹⁰ When aggregating the total cost of litigation and the total costs of IPR hearings to compare the two, studies have found that moving to the IPR process has saved about \$2.3 billion overall, or roughly \$500 million a year.¹¹¹

It is important to note that this estimate includes only direct legal costs of resolving patent assertions; it does not include the opportunity cost of diverting resources from R&D and invention into litigation, which can have an even larger overall impact on innovation. One study provided more detail on how the IPR process frees up

^{106. &}quot;America Invents Act (AIA) Frequently Asked Questions," United States Patent and Trade Office, last accessed Oct. 28, 2022. https://www.uspto.gov/patents/laws/ america-invents-act-aia/america-invents-act-aia/america-invents-act-aia/frequently-asked#type-browse-faqs_3238.

^{107.} Brian Howard and Jake Wexler, "Patent Litigation and Marketplace Report: Public Excerpt," RPX, June 2020, p. 4. https://www.rpxcorp.com/wp-content/uploads/ sites/6/2020/08/RPX-2019-Patent-Litigation-and-Marketplace-Report-Public-Excerpt.pdf.

^{108. &}quot;PTAB Trial Statistics, FY2020 End of Year Outcome Roundup, IPR, PGR, CBM," United States Patent and Trademark Office, last accessed Oct. 28, 2022. https://www. uspto.gov/sites/default/files/documents/ptab_aia_fy2020_roundup.pdf.

^{109.} Larry Sandell, "What Statistical Analysis Reveals About Winning IPR Appeals," Law360, Aug. 8, 2019. https://www.law360.com/articles/1186817.

^{110.} Cohen et al., "The growing problem of patent trolling." https://www.science.org/doi/10.1126/science.aad2686?cookieSet=1.

^{111.} Josh Landau, "Inter Partes Review: Five Years, Over \$2 Billion Saved," Patent Progress, Sept. 14, 2017. https://www.patentprogress.org/2017/09/14/inter-partes-review-saves-over-2-billion.



resources and boosts economic activity, finding that the savings generated by the IPR process increased gross domestic product by almost \$3 billion and generated more than 13,500 jobs.¹¹²

The IPR process offers significant savings and efficiencies while improving settlements—even when the IPR process is not invoked. Because PAEs must factor in a potential IPR proceeding decided by a panel of expert judges rather than by a jury, the probability of asserting likely invalid patents is reduced, as patent challenges occur not only in the shadow of the law but in the shadow of the PTAB as well.

Opponents of the PTAB and the new IPR suggest that these changes are required because the AIA's new PTAB proceedings unleashed "death squads," wantonly invalidating patents and threatening the American inventor.¹¹³ Yet this is very different from the actual functioning of the PTAB, whose patent reviews have generated outcomes similar to those seen in more costly, traditional legal challenges to weak patents. In fact, the Federal Circuit has affirmed all elements of a PTAB decision 73 percent of the time, while reversing a PTAB decision on all issues only 13 percent of the time. Other cases were a mix, with some aspects of the decision upheld and some reversed.¹¹⁴ In one sense, the PTAB will always be susceptible to arguments that it invalidates patents; that is what it was designed to do. Disputes typically arise from patents that are questionable or invalid, and eliminating such unwarranted patents does not pose a threat to invention and innovation. In fact, invalid and poor-quality patents impede invention and should be addressed as expeditiously as possible. Inventors with strong primary patents are not why the PTAB was created.

The clear intent of Congress when it passed AIA was to create an expeditious alternative to costly litigation to resolve patent disputes. Unfortunately, administrative and policy changes adopted in recent years by the USPTO reduced the scope and impact of the PTAB and IPR. Through agency guidance and binding decisions, the USPTO narrowed access to IPR proceedings. Most disconcerting has been the increasing use of "discretionary denials," whereby the USPTO chooses not to institute an IPR proceeding at all, even though a patent is most likely invalid. When this happens, the merits of the claim are not even addressed before the challenge is denied.¹¹⁵ These changes were formalized by the previous USPTO Director Andrei Iancu, in what has become known as the NHK-Fintiv rule, which has become precedential at PTAB.¹¹⁶ The rule derives from two PTAB proceedings, once that established that parallel legal proceedings were a factor to be considered and another that laid out factors for judges to consider when deciding to institute a review in which there is a parallel legal challenge. Formalizing discretionary denials had a significant impact on PTAB reviews. In 2016, there were only 77 instances in which reviews were not instituted for discretionary reasons; by 2020, there were 228 such cases. In fact, in 2020, over 40 percent of all denials were for discretionary reasons.¹¹⁷

One study provided detail on how IPR frees up resources and boosts economic activity. One finding showed that the savings generated by the IPR process



- more than 13,500 jobs

^{112. &}quot;An Assessment of the Impact of the America Invents Act and the Patent Trial and Appeal Board on the US Economy," The Perryman Group, June 25, 2020. https://www.perrymangroup.com/publications/report/an-assessment-of-the-impact-of-the-american-invents-act-and-patent-trial-and-appeal-board-on-the-us-economy/.

^{113.} Peter J. Pitts, "Patent Death Squads' vs. Innovation," Wall Street Journal, June 10, 2015. https://www.wsj.com/articles/patent-death-squads-vsinnovation-1433978591.

^{114.} Daniel F. Klodowski and Eric A. Liu, "Federal Circuit PTAB Appeal Statistics through March 31, 2022," Finnegan, April 29, 2022. https://www.finnegan.com/en/ insights/blogs/at-the-ptab-blog/federal-circuit-ptab-appeal-statistics-through-march-31-2022.html.

^{115.} Kristen Logan, "Recent Challenges to the NHK-Fintiv Rule," JD Supra, Sept. 3, 2021. https://www.jdsupra.com/legalnews/recent-challenges-to-the-nhk-fintivrule-8217467.

^{116.} Matthew Bultman, "Turning Away a Patent Challenge: The NHK-Fintiv Rule Explained," Bloomberg Law, March 3, 2021. https://news.bloomberglaw.com/ip-law/ turning-away-a-patent-challenge-the-nhk-fintiv-rule-explained.

^{117. &}quot;PTAB Discretionary Denials up 60%+ in 2020: Fueled Entirely by 314(a) Denials," Unified Patents, Jan. 5, 2021. https://www.unifiedpatents.com/insights/2020-ptab-discretionary-denials-report.



The mounting use of discretionary denials has not been without controversy, which led the USPTO to issue a request for comments on discretionary denials and the NHK-Fintiv rule. Based on these comments, the USPTO's new director, Katherine Vidal, issued a memorandum on June 1, 2022, stating, "[t]o benefit the patent system and the public good, the PTAB will not rely on the Fintiv factors to discretionarily deny institution in view of parallel district court litigation where a petition presents compelling evidence of unpatentability."¹¹⁸ The memorandum acts as interim guidance as the USPTO conducts a longer-term assessment of discretionary denials and the proper role of the post-grant review envisioned in the AIA.

A Positive Reform Agenda

Given the function and importance of the USPTO, Director Vidal is correct to revisit the role of the PTAB and the IPR process. It would also be beneficial to reexamine other institutional and funding questions to ensure that patents serve their proper role in promoting the progress of science and useful arts. Patents have had a long and disputatious history, with ebbs and flows in popularity as a tool for prompting invention. The USPTO is charged with the challenging task of identifying true invention—seeking out novel ideas while avoiding the obvious. Properly done, granting patents can provide an incentive to innovate; improperly done, patents can hamper inventors and instead become a tool for protecting the above market returns of monopolists.

If patents are to be employed to spark invention and promote innovation, the current system must be reformed. The goal is straightforward: ensure that the patent process provides an avenue for inventors with truly innovative and novel ideas while putting practices in place that can address the problem of invalid patents, both by reducing the chances that they enter the system in the first place as well as by having processes in place to address any invalid patents that do make it into the system.

To improve the quality of patents, the USPTO can look for opportunities to enhance the examination process. Providing additional training for examiners and allowing more time for a thorough examination and review of prior art may improve the quality of patents. But it is also important to carefully evaluate the incentive structure faced by patent examiners, which may tend to encourage overpatenting. Without addressing the underlying incentive structure faced by examiners within the agency, additional resources may have only a limited impact on overall patent quality. At the same time, the incentives of patentees are also important. Requiring them to share more of the burden to demonstrate the validity of a patent has an important impact on the quality of patents brought before the USPTO.

Additionally, there may be legal reforms that could address the volume of patent litigation and the strategic gaming of the patent system to impede competition while protecting monopoly rents. Tactics such as patent evergreening as well as patent thickets continue to hamper innovation and new entrants, particularly in the pharmaceutical sector. Although legal challenges to these practices may ultimately prevail, they are costly, impose significant burdens on consumers and reduce competition. Legal reforms such as a presumption for fee shifting, changes in evidentiary standards and improving the discovery process can affect the overall costs of litigation while reducing excessive litigation surrounding invalid patents. If patents are to be employed to spark invention and promote innovation, the current system must be reformed. The



^{118.} Katherine K. Vidal, "Interim Procedure for Discretionary Denials in AIA Post-grant Proceedings with Parallel District Court Litigation," United States Patent and Trademark Office, June 21, 2022. https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_ memo_20220621_.pdf.



Given the USPTO director's interest in IPR proceedings, changes to PTAB may be the most feasible reforms for improving patent quality and eliminating poor-quality patents. Limiting the role of discretionary denials is an important first step, and the director could adopt additional measures to clarify and broaden restrictions on their use. Additionally, expanding the scope of IPR proceedings to include patent-eligibility questions under Section 101 and the precision and usefulness of a patent's description under Section 112 would help eliminate invalid and overly broad patents.¹¹⁹ Postgrant review is an integral component of the AIA that minimizes litigiousness while promoting invention and innovation. The targets of such reviews are invalid patents or poorly defined patents that clutter the courts and make it difficult for inventors to act. Enhancing the PTAB's ability to identify and remove such patents would increase the overall value of the patent system.

Conclusion

Although all industrial nations may have adopted patent laws by the end of the 19th century, debates on the standards for granting and enforcing those patents continue. More work needs to be done to shore up the fundamentals of our patent system. That work must be done based on an economic foundation that appreciates both the benefits and the costs of patents. Far too often, the debate over patents is framed by a false dichotomy between a world with and without patents. Yet this choice is too simplistic and ignores the history of patents as outlined in the Constitution and defined by legislation and litigation. In this respect, patents exist within a statutory framework enacted by Congress to promote innovation. Like most laws, patent law is susceptible to capture by the regulated community.¹²⁰ Just as the administrative state has grown over time, so, too, has the patent system. Patents have expanded in both quantity and scope and, in many instances, they may be just as likely to thwart invention as to promote it.

A middle ground acknowledges the importance of patents, but tempers that belief with the concern that improperly applied patents can easily become a tool for protecting monopoly rents rather than promoting invention. Aligning patent law in a way that promotes invention and spurs economic growth is something with broad appeal, just as a system that merely protects monopolists should draw widespread disapprobation.



Just as the administrative state has grown over time, so, too, has the patent system. Patents have expanded in both quantity and scope and, in many instances, they may be just as likely to thwart invention as to promote it.

120. Robert D. Tollison, "Rent Seeking: A Survey," Kyklos 35:4 (November 1982), pp. 575-602. https://onlinelibrary.wiley.com/doi/10.1111/j.1467-6435.1982.tb00174.x.

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^{119.} Office of Patent Legal Administration, "35 USC § 101: Statutory Requirements and Four Categories of Invention," United States Patent and Trademark Office, August 2015. https://www.uspto.gov/sites/default/files/101_step1_refresher.pdf; "Appendix L - Patent Laws," United States Patent and Trademark Office, Oct. 31, 2019. https://www.uspto.gov/web/offices/pac/mpep/mpep-9015-appx-l.html#d0e302824912:~:text=(a)%20IN%20GENERAL.%E2%80%94The,carrying%20out%20 the%20invention.