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THE SEDONA CONFERENCE® INTRODUCTION TO THE LEGAL AND ECONOMIC ISSUES AT THE INTERSECTION OF THE PATENT AND ANTITRUST LAWS

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Editor:
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Patents represent strategic assets in the 21st century. But despite the importance of patents-or perhaps because of it–patent policy is increasingly unsettled. On the one hand, legal protection of new and novel ideas is the lifeblood of a modern economy. On the other, the modular nature of much innovation means that an old patent can hamper or block development of the next generation of technology. And overlapping thickets of patents must be navigated to make virtually any complex product. Ultimately, too much protection risks future advances while too little protection jeopardizes today's innovations.

Finding a path of grace between these two extremes is not a new challenge. Judges and legislatures have been wrestling with the appropriate mix of robust competition and state-sanctioned monopoly to advance new technology since at least the 16th century. In today's courtrooms, the boundaries of these two very different legal regimes are most often delineated at the points of intersection between patent law and antitrust law.

Working Group 4 of The Sedona Conference has been studying the intersection of patent and antitrust law. This article sketches the background for the Working Group's evaluation of this intersection. It reviews the common law roots of both antitrust and patent law, and highlights the potential for tensions developing between antitrust and intellectual property law.

1. Common Law Roots

The English common law was skeptical, if not hostile, to any form of monopoly. Sir Thomas More, for example, in his book *Utopia*, written in 1516, opined that " Suffer not thies ryche men to bye up all, to ingross and forstalle, and with theyr monopolye to kepe the market alone as please them."[1] The royal family, however, could issue letters patent[2] to give individuals monopolies over particular lines of commerce.[3] This was relatively rare until the time of Elizabeth I who issued letters patent on a wide range of ordinary consumer goods including salt, iron, playing cards, beer and various kinds of cloth.[4] In response to the "odium which arose from abuse" of royal grants,[5] Parliament enacted the Statute of Monopolies in 1623.[6] The Act prohibited "all monopolies" with one exception. That exception was for letters patent for a period not to exceed fourteen years for the "sole working or making of any new manufactures within the realm" to be granted to the "true and first inventor" but only if "not contrary to the law nor mischievous to the state by raising prices of commodities at home, or hurt of trade or generally inconvenient."[7]

* This paper is a project of The Sedona® Conference Working Group on the Intersection of the Patent and Antitrust Laws (WG4). Special thanks go to all of the WG4 members and observers who have contributed to the development of this piece. This document is for educational purposes only and is not a substitute for legal advice. The opinions expressed herein are consensus views of the Working Group and do not necessarily represent the views of any individual participants or authors or any of the organizations to which they belong or clients they represent

1 H. Fox, *Monopolies and Patents* 24 (1947)
2 Letters patent were public documents as opposed to letters close which were sealed.
3 *See Darcy v. Allein*, 11 Co. Rep. 84b, 77 Eng. Rep. 1260 (*K.B. 1602)* (Darcy was allowed to monopolize the sale of playing cards pursuant to a royal grant even though such monopolies were contrary to the common law.)
4 Miller, *The Case of the Monopolies-Some of Its Results and Suggestions*, 6 Mich. L. Rev. 1, 2 (1907)
5 4 W. Holdsworth, *A History of English Law* 348 (2nd ed. 1937)
6 An Act concerning Monopolies and Dispensations with Penal Laws and the Forfeitures thereof, 21 Jac. 1, c. 3 (4 Statutes at Large 734 (1811)
7 *Id*. at section 6

Sir Edward Coke's commentaries on the common law of England became the standard reference works for law students like Jefferson and Adams in the American colonies. His report on the Case of Monopolies concluded that a grant of an exclusive license to sell playing cards "was utterly void" as "against the common law."[8] He noted that among the "inseparable incidents" of every monopoly were that (1) "the price of the same commodity will be raised, for he who has the sole selling of any commodity, may and will make the price as he pleases"; (2) "after the commodity [is] granted, the commodity is not so good as it was before"; and (3) monopoly "tends to the impoverishment of divers artificers" who are precluded from making the monopolized product.[9]

When the U.S. Constitution was drafted, four states suggested amendments that would have paralleled the English Statute of Monopolies. Although advocated by Jefferson, this proposal was not adopted.[10] Rather, the new Constitution authorized Congress to enact laws to "promote science and the useful arts by securing for limited times to authors and inventors the exclusive right to their respective writing and discoveries."[11] According to Madison in Federalist No. 43, this was included to "protect a right of common law."[12] And in this instance, he argued, the "public good fully coincides…with the claims of individuals."[13]

The first patent law under the new Constitution was enacted in 1890 as "An Act to Promote the Progress of Useful Arts". This was succeeded in 1893 with a statute substantially attributed to Jefferson,[14] the language of which is virtually identical to parts of today's law.[15] Patentable subjects included "any new and useful art, machine, manufacture or composition of matter or any new and useful improvement on any art, machine, manufacture or composition of matter."[16] An applicant had to provide a "written description of his invention, and of the manner of using, or process of compounding the same, in such full, clear and exact terms to distinguish the same from all other things before known and to enable any person skilled in the art or science of which it is a part, or with which it is most nearly connected, to make, compound and use the same."[17] An inventor was required to "fully explain the principle, and the several modes in which he has contemplated the application of" his invention.[18] Only the "true inventor" could seek to obtain a patent and only if the invention had not been "known or used before the application."[19] Like the 1623 Statute on Monopolies, letters patent guaranteed a state-protected monopoly for fourteen years.

The nineteenth century saw a dramatic increase in the number of patents. Doctrinally, the most important legal development was the mid-century decision in *Hotchkiss v. Greenwood*,[20] that clarified that a patentable invention had to be not only new, but not obvious. This was enforced by a new examination system that is credited by economic historians with reducing the number of patent lawsuits and spurring innovation.[21] In 1887, the United States joined the Paris Convention for the Protection of Industrial Property to become a formal part of international efforts to protect patented inventions.

In 1890, the Sherman Act became law.[22] The new statute prohibited both combinations in restraint of trade and monopolization. Senator Sherman stated that the new Act was designed to "supplement the enforcement of established rules of the common and statute law by the courts of the several States".[23] With enactment of the Sherman Act, the competing elements of the Statute on Monopolies became part of U.S. statutory law. The general prohibitions against restraints of trade and monopoly were now explicit in the Sherman Act while its limited exception to encourage new inventions was captured in the Patent Act.

8 *Darcy v. Allein* (The Case of Monopolies) 11 Co. Rep. 84b, 77 Eng.Rep. 1260 (K.B. 1603)
9 *Id.*
10 Letter, Jefferson to Madison, (Aug. 28, 1789, in *The Republic of Letters* 1 (James Morton Smith, ed., 1995)
11 U.S. Constitution, Art. 1, Section 8, clause 8
12 The Federalist No. 43 (Madison)
13 *Id.*
14 *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 147 (1989)
15 Compare Patent Act of 1793, 1 Stat. 318-323 (February 21, 1793), section 1 with 35 U.S.C. section 101
16 Patent Act of 1793, section 1, 1 Stat. 318-323 (February 21, 1793)
17 Patent Act of 1793, section 3, 1 Stat. 318-323 (February 21, 1793)
18 *Id.*
19 Patent Act of 1793, sections 3 and 1, 1 Stat. 318-323 (February 21, 1793)
20 52 U.S. 248 (1850)
21 Zorina B. Khan, *The Democratization of Invention: Patents and Copyrights in American Economic Development*, 1790-1920 (2004)
22 26 Stats. 209 (July 2, 1890)
23 21Cong. Rec. 2547 (1890)

2. The PTO and its "Customers"

The Patent and Trademark Office issued 165,485 patents in federal fiscal year 2005. This is over twice the number issued in 1985 and approximately 30% more than in 1995.[24] Despite political rhetoric suggesting that patents uniquely advance U.S. interests, 80,247 of these patents, or approximately half, were issued to residents of foreign nations.[25] Japan led with 34,079 patents with Germany second with 10,502. Emerging technology centers like China and India were well behind with 583 and 405 patents, respectively.

The PTO has declared its mission to be "helping our customers get patents."[26] Examiners spend an estimated 18 hours on an individual application, reviewing the application, testing it against prior art contained in various data bases and writing up their analyses.[27] The process is secret and much of the burden of providing prior art, particularly in the most innovative industries, is on patentees' legal representatives.[28] Incentives in the PTO are generally understood to favor grants over denials,[29] and 95-97% of all applications ultimately result in a patent.[30] Despite this approval rate, it takes an average of thirty-one months to process a patent application, a backlog the agency expects to close by hiring 1,200 new examiners in 2007.[31] These hires are in addition to a record-setting addition of 1,193 examiners in 2006.[32]

In the last 15 years, the PTO has administered a system that has become increasingly patent friendly. The United States Supreme Court concluded in 1980 that a newly developed microorganism could be the subject of a patent in *Diamond v. Chakrabarty*.[33] In the following year, it determined in *Diamond v. Diehr* that a computer program could be patented.[34]

The doctrine of equivalency was given a broad sweep in the Court's decisions in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co*[35] and *Festo v. Shoketsu Kinzoku Kogyo Kabushiki*, although the Court acknowledged that this made the scope of patents "less certain".[36] These decisions contrast with earlier cases that opined that clear definition of claims was necessary to "guard against unreasonable advantages to the patentee and disadvantages to others arising from uncertainty as to their rights."[37]

The Federal Circuit, created in 1982 to bring uniformity to patent jurisprudence, raised evidentiary standards for challenging patents in 1986.[38] The same court relaxed standards for evaluating whether an invention is "obvious" to practitioners skilled in the art.[39] It also softened the "best mode" requirement, substantially freeing applicants from having to specify the means by which their inventions will work in the real world.[40] According to an IBM attorney, this "invites the patenting of ideas that may have been visualized as desirable but have no foundation in terms of the research or development that may be required to enable their implementation."[41]

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24 U.S. Patent and Trade Office, *Performance and Accountability Report Fiscal Year 2005,* Table 6: Patents Issued, *available at* http://www.uspto.gov/web/offices/com/annual/2005/060406_table6.html
25 *Id.* Table 10: Patents Issued by United States to Residents of Foreign Countries (FY 2001-FY 2005) (Preliminary for FY 2005), *available at* http://www.uspto.gov/web/offices/com/annual/2005/060410_table10.html
26 Mark Lemley, *Rational Ignorance at the Patent Office*, 95 Northwestern L. Rev. 1, 2 n. 3 (2001). The current formal mission statement provides that: "The USPTO's mission is to insure that the Intellectual Property system contributes to a strong global economy, encourages investment in innovation, and fosters entrepreneurial spirit. Intellectual property is an invention or creation embodied in the form of a patent, trademark, trade secret, or copyright." *available at* http://www.uspto.gov/web/menu/intro.html.
27 Brenda Sandburg, *Speed Over Substance*? Intell. Prop. Mag., Mar 1999 (estimating 18 hours on average with more time spent on more complex applications); *compare Patent Nonsense: The Knowledge Monopolies,* The Economist, April 8, 2000 ("[P]atent examiners spend only eight hours on a patent, on average.")
28 37 CFR section 1.56
29 Mark Lemley, *Rational Ignorance at the Patent Office*, 95 Northwestern L. Rev. 1, 2, n. 3 (2001)
30 Cecil D. Quillen, Jr. & Ogden H. Webster, *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office*, 11 Fed. Cir. B.J. 1 (2001)
31 U.S. Patent and Trademark Office, 2007-2012 Strategic Plan 6, *available at* http://www.uspto.gov/web/offices/com/strat2007/stratplan2007-2012.pdf
32 *Id.*
33 447 U.S. 303 (1980)
34 450 U.S. 175 (1981)
35 520 U.S. 17 (1997)
36 535 U.S. 722, 732 (2002)
37 *McClain v. Ortmayer*, 141 U.S. 419, 424 (1891), *see also General Electric Co. v. Wabash Appliance Corp*., 304 U.S. 364, 369 (1938)
38 *Medtronics, Inc. v. Intermedics, Inc*., 799 F.2d 734 (Fed. Cir. 1986); *Hybridtech Inc.v. Monoclonal Antibodies Inc*., 802 F.2d 1367 (Fed Cir.1986)
39 *Stratoflex, Inc. v. Aeroquip Corp*., 713 F.2d 1530 (Fed. Cir. 1983); *Simmons Fastener Corporation v. Illinois Tool Works*, 739 F.2d 1573 (1984)
40 Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology Specific*?, 17 Berkeley Technology Law Journal 9-10 (2003)
41 John D. Flynn, *Comments on the International Effort to Harmonize the Substantive Requirements of Patent Laws* (IBM 2001), *available at* http://www.uspto.gov/web/offices/dcom/olia/harmonization/TAB42.pdf

Finally, the Federal Circuit decided in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*[42] that "business methods" are patentable. As one patent specialist noted in the *National Law Journal*, companies should "now seek U.S. patent rights for any conceivable business operation, such as methods of billing clients, hiring employees, marketing products or service…or simply obtaining funding."[43]

These developments have engendered dramatically different reactions. At one end of the spectrum, the PTO argues that the current system "has propelled our nation from a small agrarian society to the preeminent technological and economic superpower…and has become the basis for economic development in nations throughout the world."[44] At the other, the National Institutes of Health have stated categorically that the granting of patent rights for biological research tools, expected to be critical for the development of stem cell technologies, "can stifle the broad dissemination of new discoveries and limit future avenues of research and product development."[45]

In the middle, a 2003 report of the Federal Trade Commission concluded that while there was "much to praise" in the system, "[p]oor patent quality and legal standards and procedures that inadvertently may have anticompetitive effects can…hamper competition that otherwise would stimulate innovation."[46] To address its concerns, the FTC suggested a number of reforms including third-party involvement in challenging patents during the examination process, strengthening the obviousness requirement and reclaiming the "preponderance of the evidence" review standard.[47]

Likewise, the National Academy of Sciences concluded in a major report in 2004 that "[c]ontinuing high rates of innovation suggest that the patent system is working well and does not require fundamental changes."[48] However, the National Academy, like the FTC, suggested that a number of reforms are necessary including reinvigoration of the obviousness requirement, institution of third-party participation in the process at the PTO, shielding some research uses of patented products or processes from infringement claims and increased staffing at the agency.[49]

Both the Supreme Court and the Congress have begun to react to concerns about patent quality. In *KSR International v. Teleflex, Inc.*,[50] the Court rejected Federal Circuit precedent on obviousness, scoring that court's approach as too formulaic. The Supreme Court concluded that:

> …the results of ordinary innovation [based on existing art] are not the subject of exclusive rights under the patent laws. Were it otherwise patents might stifle, rather than promote, the progress of useful arts.[51]

Other high court cases have also begun to cut back on Federal Circuit decisions. In two important procedural decisions, the Court has made it easier to effectively challenge poor patents. In *eBay, Inc. v. MercExchange, L.L.C.*,[52] the Court rejected the principle that injunctions should be issued in the normal course of patent litigation. It noted that such a rule was contrary to equity jurisprudence in other areas of the law, and four justices argued that the reflexive issuance of injunctions gave "undue leverage" to patent holders for claims of "potential vagueness and suspect validity."[53] In *Medimmune, Inc. v. Genetech, Inc.*,[54] the Court rejected jurisprudence requiring a patent licensee to breach its licensing agreement in order to seek a judgment on the patent's validity.

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42 927 F. Supp. 502, 516 (D.Mass. 1996), rev'd, 149 F.3d 1368 (Fed. Cir. 1998), cert. denied, 525 U.S. 1093 (1999)
43 Barry Schindler, *In Focus: Intellectual Property, Key ruling for business methods*, The National Law Journal (December 5, 2005)
44 Jon W. Dudas, Message from the Undersecretary of Commerce for Intellectual Property and Director of the U.S. Patent and Trademark Office 1 (November 2, 2005, *available at* http://www.uspto.gov/web/offices/com/annual/2005/02_message_director.html
45 Principles and Guidelines for Recipients of NIH Grants for Contracts on Obtaining and Disseminating Biomedical Research Resources: Final Notice, 64 Fed.Reg. 72,090, 72,092 (December 23, 1999); *see also* Scott Iyama, *The USPTO's Proposal of a Biological Research Tool Patent Pool Doesn't Hold Water*, 57 Stan.L.Rev. 1223 (2005)
46 Federal Trade Commission, *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy* 4-5 (October 2003), *available at* http://www.ftc.gov/os/2003/10/innovationrpt.pdf
47 *Id*. at 7-18
48 Committee on Intellectual Property Rights, National Research Council, *A Patent System for the 21st Century* 1 (Stephen A. Merrill, Richard C. Levin & Mark B. Myers, eds.) (National Academy of Sciences, 2004)
49 *Id*. at 5-8.
50 ___ U.S. ___, 127 S.Ct. 1727 (2007)
51 *Id*. at 1746.
52 ___ U.S. ___, 126 S.Ct. 1837 (2006).
53 *Id*. at 1842.
54 549 U.S. ___, 127 S.Ct. 764 (2007).

Congress has begun its own overhaul of the patent system. After several years of hearings, omnibus bills to amend the patent law have been reported to the floors of both houses.[55] Although there are major differences in the two bills, both the House and Senate bills provide for a post-grant opposition procedure already used in Europe to improve patent quality.[56]

3. Patent Thickets, Strategic Portfolios and the Business of Innovation

Many people think that a single patent will give rise to a complete product, as Alexander Graham Bell's work gave rise to the telephone. Modern realities are far different. The DVD player and disk, for example, require the interplay of 115 patents for the players and 95 patents for the disks themselves. The patents for the practical production of these products are held by Koninklijke Philips Electronics, N.V. Sony Corporation of Japan and Pioneer Electronics of Japan.[57]

The interplay of patents can be so dense that innovators can face a "patent thicket". Such thickets have been defined academically as "an overlapping set of patent rights requiring that those seeking to commercialize new technology obtain licenses from multiple patentees."[58] Patent thickets for innovative companies are akin to walking through a dense wood without stepping on a twig.

In response to patent thickets in which multiple patents from competing companies "read on" each other, technology companies have sought collections of patents that will force other companies in the thicket to seek licenses from them. The key is the ability to threaten others who wish to make products with potential infringement claims. According to Cisco general counsel Mark Chandler, his company invests in patents "to assure that if someone wants to assert patents against us, we will have some countervailing tools."[59] Research suggests that large companies tend to seek a large number of patents while smaller companies will seek fewer, but more strategic, patents.[60]

The value of a patent portfolio is hard to measure. However, an effective portfolio should facilitate in-house innovation, side-step expensive litigation, improve the company's bargaining position with rivals and enhance efforts to attract capital.[61] A closely related set of patents can operate as a "super-patent", fencing competitors out of a lucrative area.[62]

The cost of securing a U.S. patent in 1996 ranged from $10,000 to $30,000.[63] The cost of securing the same patent in 10 European countries was typically $95,000.[64] If the patents are litigated, a survey of the American Intellectual Property Law Association in 2003 found that the median cost of discovery in actions involving less than $1 million was $290,000 while the total litigation costs were $500,000.[65] For actions in which the patent was worth between $1 million and $25 million, discovery costs were $1 million and the total litigation costs were $2 million.[66] While these costs are substantial, and have certainly risen, even a spurious threat of an infringement claim can cause companies to pay significant sums. For example, hundreds of companies paid a total of $1.5 billion in royalties to the Lemelson Foundation for so-called "submarine" patents on bar code technology that were ultimately held to be unenforceable by the Federal Circuit.[67]

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55 H.R. 1908 (Berman et al.), reported to the House floor on July 18, 2007, S. 1145 (Leahy et al.), reported to the Senate floor on July 19, 2007; *See* Marcia Coyle, *Patent reform finds traction*, 29 National Law Journal 1 (July 30, 2007)
56 *Id.* at 17
57 DOJ Business Review Letter, Assistant Attorney General Joel I. Klein to Gerard R. Beeney, re: Proposed package licensing of essential DVD patents 2 (December 16, 1998), *available at* http://www.usdoj.gov/atr/public/busreview/2121.htm
58 Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools and Standard-Setting*, 1 *Innovation Policy and the Economy* 1 (Adam Jaffe, Joshua Lerner and Scott Stern, eds.) (MIT Press, 2001)
59 Michael Orley, *The Patent Epidemic: It's wasting companies' money and slowing the development of new products*, Business Week (January 6, 2006) 60, 61
60 John R. Allison & Mark A. Lemley, *Who's Patenting What? An Empirical Exploration of Patent Prosecution*, 53 Vanderbilt L.Rev. 2099, 2128 (2000); *see also* F.M Scherer, *Schrumpeter and Plausible Capitalism*, 30 J.Econ. Literature 1416, 1423 (1992)
61 Gideon Parchomovsky & R.Polk Wagner, Patent Portfolios, 154 U.Pa.L. Rev. 1, 33-44 (2005); see also James Bessen, *Patent Thickets: Strategic Patenting of Complex Technologies*, *available at* http://www.researchoninnovation.org/online.htm#thicket
62 *Id.* 32-33
63 Wayne M. Kennard, *Obtaining and Litigating Software Patents*, 431 PLI/Pat 193, 208 (1996)
64 Edwin F. Berrier, Jr., *Global Patent Costs Must Be Reduced*, 36 IDEA 473, 476-77 (1996)
65 Am. Intellectual Prop. Law Assoc., Report of the Economic Survey 2003, at 22 (2003), cited in James E. Besson & Michael J. Meurer, *Lessons for Patent Policy from Empirical Research on Patent Litigation*, 9 Lewis & Clark L.Rev. 1, 2, n. 5
66 *Id.*
67 Brenda Sandburg, *Lemelson patents are unenforceable*, The Recorder (September 13, 2005); *see Symbol Technologies v. Lemelson Medical, Education & Research Foundation*, 422 F.3d 1378 (Fed. Cir. 2005)

4. Academic Perspectives on Patents and Innovation

The role of innovation in the economy is an on-going subject of academic research and thought. Joseph Schumpeter, an early writer on innovation, famously rejected much classical economic thought, arguing that "perennial gales of creative destruction" made concepts like market power of limited relevance.[68] At the other end of the spectrum, it has been argued that patent monopolies–assuming they confer market power–must be closely circumscribed.[69] This view was reflected in the so-called "nine no-no's", a list of licensing practices that the U.S. Department of Justice once considered presumptively unlawful.[70]

By the 1970's, it was argued that since patents can add to consumer welfare, there was no necessary tension between antitrust and patent law.[71] Ward Bowman, for example, wrote that:

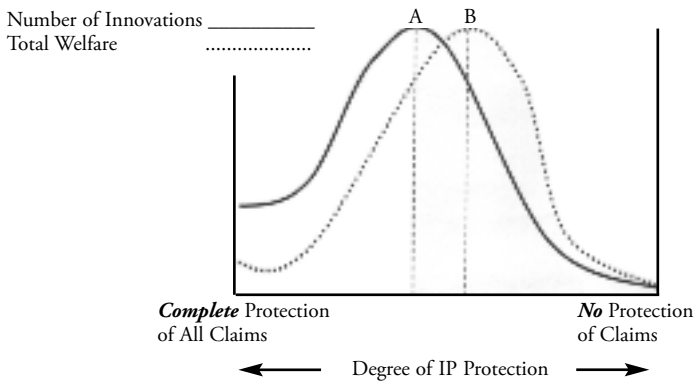
> Both antitrust law and patent law have a common central economic goal: to maximize wealth by producing what consumers want at the lowest cost. In serving this common goal, reconciliation between patent and antitrust law involves serious problems of assessing effects, but not conflicting purposes.[72]

While Bowman saw this as theoretically correct, he cautioned that there are "serious problems of assessing effects" of patent monopolies.

Landes and Posner commented that "if intellectual property rights are enforced too strictly, then subsequent innovators will be foreclosed and overall welfare will be reduced."[73] Likewise, a respected Berkeley economist has noted: "when there are multiple gate keepers, each of whom must grant permission before a resource can be used…the resource may be underutilized" and, in the case of patents, "innovation is stifled."[74] [75]

The point made by all three of these commentators is illustrated by a chart created by James Langenfeld.[76] In Figure 1, both the number of innovations and total welfare are charted on a single graph. The horizontal axis delineates the possible levels of IP protection from complete IP protection at the far left to no protection at the far right.

Figure 1: Optimal IP Protection



68 Joseph A. Shumpeter, *The Process of Creative Destruction* (Unwin. 1942).
69 *See, e.g., Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661 (1944); *Carbice Corp. v. American Patents Dev. Corp.*, 283 U.S. 27 (1931)
70 For a description of the Nine No-No's, see Willard K. Tom & Joshua A. Newberg, *Antitrust and Intellectual Property: From Separate Spheres to Unified Field*, 66 Antitrust L. J. 167, 178-184 (1998).
71 Charles Rule, *The Administration's Views: Antitrust Analysis after the Nine No-No's*, 55 Antitrust L.J. 365 (1986); *see also* Richard Gilbert and Carl Shapiro, *Antitrust Issues in the Licensing of Intellectual Property: The Nine No-No's Meet the Nineties*, Brookings Papers on Economics: Micronomics 283-336 (1997)
72 Ward Bowman, Jr., *Patent and Antitrust Law: A Legal and Economic Portfolio* (1973)
73 William Landes & Richard Posner, *An Economic Analysis of Copyright Law*, 18 J. Legal Stud. 325, 326 (1989)
74 Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools and Standard-Setting*, 1 Innovation Policy and the Economy (Adam Jaffe, Joshua Lerner, and Scott Stern, eds. MIT Press, 2001)
75 Researchers have also uncovered a so-called "patent paradox", that is, increased patenting is associated with declining expenditures on research and development and reductions in real innovation. Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U.Pa.L. Rev. 1 (2005)
76 James Langenfeld, *Intellectual Property Protection and Antitrust: Steps Toward Striking a Balance*, 53 Case Western Res. L.Rev. 91, 97 (2001)

Looking first at innovation, total innovation is lower with complete protection of all IP claims because subsequent inventors are foreclosed from prior art unless they pay significant rents. This is reflected by the point of intersection between the total innovation line and the vertical axis. But innovation increases to point A as innovators are allowed to more fully take advantage of prior art. After Point A, however, innovation declines because the inventors' incentives are diminished. That is, inventors cannot reap as many profits from their inventions because others can more easily copy the innovation and drive down prices.

The line for total welfare peaks at Point B, somewhat to the right of the peak of the total innovation line. According to Dr. Langenfeld:

> With complete intellectual property protection, total welfare is relatively lower than the number of innovations. Innovators gain all of the benefits from their innovations, there is no price competition or competition from the follow innovations of others, and no consumer surplus from innovations. As intellectual property protection is relaxed (moving left to right in Figure 1), total welfare increases to its peak at point B, with more development innovations by others and more competition reducing prices and increasing consumer welfare. The optimal total welfare will in general be at the point B, right of point A, indicating that total welfare is maximized with less intellectual property protection than a structure designed to maximize innovations. However, reducing intellectual property protection below point B reduces total welfare as innovators have increasingly less incentive to innovate and fewer innovations occur.[77]

Antitrust enforcers have typically focused on maximizing total or consumer welfare,[78] not maximizing the number of innovations. If patent law is interpreted to maximize the number of innovations and not weigh the benefits of price competition to consumers, then there is the clear possibility that patent and antitrust laws can come into conflict. This is an important touchstone when assessing the competing, and often contentious, claims of patent and antitrust law.

This analysis assumes that there is a clear relationship between the scope and depth of intellectual property protection and the production of new innovations. This assumed relationship is the subject of increasing scrutiny, with some economists arguing that patents play a "surprisingly minor role" in innovation pointing, instead, to larger economic trends like levels of education and the scope of public funding of basic research.[79] Recognizably, such research could have a profound effect on how we think about the relationship between antitrust law and the patent system.

5. Conclusion

In the context of the potential tension of patent and antitrust laws, the Sedona Working Group 4 is in the process of analyzing a number of specific recurring and practical issues at the intersection of antitrust and patent laws. The Working Group is composed of lawyers and economists, members of plaintiff and defense bars, intellectual property and competitive experts, and public officials. This group is attempting to develop principles of decision and analysis that offer practical guides to navigating the particularly difficult points at the intersection between antitrust and patent law.

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77 Langenfeld, *supra*, n. 68 at 98. The precise peaks of the curves discussed above will likely be the subject of further empirical research. Economists continue to research the sources and drivers of innovation in modern economies. In particular, research continues on the relationship of innovation to levels of IP protection, levels of education, macroeconomic activity and many other factors.

78 *See, e.g.*, Timothy J. Muris, *Robert Pitofsky Public Servant and Scholar*, 52 CASE W. RED. L. REV. 25, 37 (2001). ("there is wide-spread agreement that the purpose of antitrust is to protect consumers"). Antitrust laws allow government agencies or private parties to obtain relief by eliminating practices that reduce competition in pricing or innovation, and obtaining fines or damages.

79 This analysis assumes that the degree of IP protection is the important driver of innovation. Various writers suggest that many other factors affect innovation. *See, e.g.*, F.M. Scherer, *The Political Economy of Patent Policy Reform in the United States* (Harvard University, 2006), *available at* http://scholar.google.com/scholar?hl=en&lr=&oi=qs&q=fm+scherer+the+political+economy+of+patent+policy+author:f-scherer (patents play "surprisingly minor role" in decisions of companies to invest in research and development)