

# From Arms Race to Marketplace: The Complex Patent Ecosystem and Its Implications for the Patent System

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*For years, high-tech companies have amassed patents in order to deter patent litigation. Recently, a secondary market for patents has flourished, making it more likely that patents that would otherwise sit on the shelf will end up in the courtroom. This Article explores the current patent ecosystem, which includes both “arms race” and “marketplace” paradigms, in depth. I distinguish “patent-assertion entities,” entities that use patents primarily to obtain license fees rather than to support the development or transfer of technology, from other types of non-practicing entities. I contrast the patent arms race, whose goal is to provide entities with the freedom to operate, with the marketplace, through which entities have leveraged their freedom to litigate. I detail the participation of product companies as well as non-practicing companies and their intermediaries in the marketplace, and trace the diverse “pathways” traveled by patents from a diversity of sources including failed startups and product companies like Micron, to entities like Round Rock and Intellectual Ventures.*

*Several implications follow. First, the failure of the patent arms race to deter lawsuits from patent assertion entities as well as practicing companies in certain cases means that defensive strategies must be reconceptualized to include new tactics—including prevention, disruption, and coordination—for securing freedom to operate. In addition, if stockpiles of unused patents patent continue to fall into the hands of patent-assertion entities, defensive patenting may ironically have the net effect of increasing, rather than decreasing, litigation risk. Second, conventional notions of patent value need to be revised. The same patent has a much greater “exclusion value”—which I define as the value likely to be extracted from the patent—when held by a patent-assertion entity rather than a company vulnerable to countersuit. A better understanding of what drives the exclusion value rather than the intrinsic value of a patent might help companies predict and potentially avoid technical areas where patent assertion is most likely. Finally, recent history suggests trying to change the system by changing patentee behavior directly, rather than only through legal changes, for example by encouraging quality patenting, improving coordination between patent defendants, and creating a nonprofit organization to accept patent donations in order to encourage companies to make their unused patents available to the public, rather than to patent-assertion entities.*

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## INTRODUCTION

Among the many reasons high-tech companies get patents, one of the most important is to build a patent arsenal. To guard against the risk of patent litigation, companies acquire patents so they can retaliate against or neutralize threats of suits brought by their competitors. A large patent portfolio is likely to discourage such threats in the first place. As companies seek to outdo their rivals and to minimize the risk of ending up in court, the acquisition of even more patents is justified. Companies seeking freedom to operate have obtained thousands of patents as part of the “patent arms race.”<sup>1</sup>

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1. See *infra* Part I.A. See generally Stuart J.H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255 (2009) (reporting on surveys that confirm that companies in high-tech industries amass patents as bargaining chips against other patentees and to prevent suits by others); Bronwyn H. Hall & Rosemarie Ham Ziedonis, *The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979–1995*, 32 RAND J. ECON. 101 (2001) (examining the propensity of semiconductor firms to obtain patents despite their ineffectiveness in appropriating returns to research and development (“R&D”)); James Bessen & Robert M. Hunt, *An Empirical Look at Software Patents* 4 (Fed. Reserve Bank of Phila., Working Paper No. 03-17/R, 2004), available at <http://www.researchoninnovation.org/swpat.pdf> (providing empirical accounts of the apparent “arms race” in the semiconductor and software industries); Wesley M. Cohen, Richard R. Nelson & John P. Walsh, *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)* 26–27 (Nat’l Bureau of Econ. Research, Working Paper No. 7552, 2000), available at <http://www.dklevine.com/archive/cohen-survey.pdf> (“[P]revention of suits [is] one of the most

Against this backdrop, the patent system has recently witnessed the rise of the patent marketplace.<sup>2</sup> Over the past few years, thousands of patents have changed hands<sup>3</sup> as defunct companies, independent inventors, corporations, and others have sold their assets to those in a better position to exploit them. The most visible buyers of patents have been “patent-assertion entities,” which I define as entities that use patents primarily to get licensing fees rather than to support the development or transfer of technology.<sup>4</sup> These entities generally use their patents to sue, or threaten to sue, practicing companies. They are invulnerable to patent counterattack and therefore have little to lose from patent litigation besides legal fees.<sup>5</sup>

Together, the “arms race” and “marketplace” paradigms define what I call “the complex patent ecosystem.”<sup>6</sup> An understanding of how this ecosystem operates within high-tech industries is critical, as these industries have suffered the most from the problems of patent backlog and “bad” patents,<sup>7</sup> complained the loudest about growth of patent-assertion entities, and pushed the hardest for change.<sup>8</sup> Missing from the debate, however, is a full account of the context of these seemingly disparate calls. This Article seeks to provide this context. It describes the history and present state of the patent arms race and patent marketplace, as well as the strategies companies are pursuing within the complex patent ecosystem to cope with its risks and to take advantage of its opportunities.

Although both paradigms have flourished, the arms race and marketplace present a study in contrasts. In the patent arms race, patent arsenals signal a patentee’s power to retaliate; patent transactions in the marketplace, in contrast, are often kept secret. While patent détente requires symmetry between would-be litigants, the patent marketplace

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important uses of patents across all industries.”). For anecdotal accounts, see statements of Robert Barr and Russ Slifer, *infra* notes 16, 40 (giving public testimony about their companies’ participation in the patent arms race) and *Patents: Smart Assets*, *ECONOMIST*, Feb. 19, 2005, at 60, 60.

2. See *infra* Part I.B.

3. For example, Intellectual Ventures (“IV”), founded in 2000, has alone acquired tens of thousands of patents. Nathan Myhrvold, *The Big Idea: Funding Eureka!*, *HARV. BUS. REV.*, Mar. 2010, at 41, 41; see also *infra* note 114.

4. This definition resembles Justice Kennedy’s description in *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 396 (2006), of “firms [that] use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees.” For further discussion, see *infra* Part II.B.2.

5. See Colleen Chien, *Of Trolls, Davids, Goliaths, and Kings: Narratives and Evidence in the Litigation of High-Tech Patents*, 87 *N.C. L. REV.* 1571, 1577–79 (2009).

6. The term “patent ecosystem” was used, though not defined, by Brian Kahin in his testimony to the Federal Trade Commission (FTC) on December 5, 2008. Brian Kahin, *The Patent Ecosystem in IT: Business Practice and Arbitrage* (Dec. 5, 2008) (submission based on remarks before the FTC), available at <http://www.ftc.gov/bc/workshops/ipmarketplace/dec5/docs/bkahun2.pdf>.

7. See *infra* Part III.C.1–2.

8. See *infra* Part III.A.

facilitates the exploitation of asymmetries between actors. Companies who participate in the patent arms race desire freedom to operate; the marketplace has enabled companies to leverage their freedom to litigate.

Closer inspection, however, reveals interrelationships between arms race and marketplace strategies. Patents initially acquired defensively have ended up for sale in the patent marketplace, through corporate divestitures and sales.<sup>9</sup> Practicing companies have used their once-defensive patents to selectively sue in areas in where they no longer or never did operate, using the same tactics as patent-assertion entities.<sup>10</sup> Patent-assertion entities that aggregate patents into large portfolios and sell licenses to them arguably reduce risk for companies in the same ways that defensive patents do. These dynamics have several implications for patent strategy, patent valuation, and patent reform.

First, the new complex patent ecosystem has undermined the logic of the patent arms race. While patent arsenals have clearly failed to discourage lawsuits brought by patent holding entities, they have, at best, resulted in an uneasy truce among practicing companies. Though certain types of suits have likely been deterred, data presented in this Article shows that others have not. This incomplete protection has come at a social cost, contributing to the quality problem by creating a demand for patents that were never intended to be enforced, and contributing to the hold-up problem by creating stockpiles of unused patents that, when sold on the open market, are at risk of winding up in the hands of patent-assertion entities.

Second, patents are generally assumed to have an objective value, which can be estimated based on intrinsic qualities of a patent, such as the breadth of its claims, the amount of prior art it cites, and its prosecution history.<sup>11</sup> The assumption that each patent has an intrinsic value underlies a host of policy proposals, including deferred examination and gold-plating patents. But today's complex patent ecosystem reminds us that the value a patentee is likely to extract from a patent by asserting it against others—what I call the “exclusion value” of a patent—can fluctuate widely as the patent is bought and sold. There is a difference between a patent's intrinsic value and its exclusion value. Little theoretical or empirical attention has been paid thus far to understanding the drivers of exclusion value, as distinct from intrinsic value. A better understanding of these drivers, however, could help companies predict and potentially avoid technical areas, where patent assertion is most likely, as well as help to distinguish between the portion

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9. See discussion *infra* Parts I.B.2.a, IV.A.

10. See empirical analysis of same, reported *infra* at Part III.B.

11. Valuation literature making these assumptions is described *infra* notes 299 and 336.

of a patent royalty that is due to hold-up and that which is due to technical contribution.

Finally, the history of the new complex ecosystem contains novel suggestions for patent reform. Scholars and policymakers tend to conceive of the patent system in terms of its three principal institutions—Congress, the courts, and the United States Patent and Trademark Office (USPTO)—and assume that the patent system can only be changed by adjusting a lever controlled by one of them.<sup>12</sup> However, the history of the patent ecosystem highlights the influence of non-legal developments, including demonstration effects and business model innovations, on the patent system.<sup>13</sup> This history suggests changing the patent system by changing patentee behavior directly, rather than through one of these three institutions. Improving patent quality and reducing patent hold-up might potentially be accomplished, for example, by promotion of quality patenting, abandonment or donation rather than sale of unused patents, and improved coordination by companies, rather than by just changing the law.<sup>14</sup>

This Article explores the new complex patent ecosystem and its implications for the patent system. It proceeds in five parts. Part I describes the two major paradigms in high-tech patenting—the patent arms race and the marketplace—and how individual companies, demonstration effects, and licensing practices have driven their adoption. Part II provides an overview of the current patent ecosystem, of how it has become complex by virtue of the variety of the practicing and non-practicing company types it features, and of the growing asymmetry between actors. Parts III–V discuss how the new patent ecosystem challenges conventional beliefs about the patent system and, more broadly, the implications of these challenges for patent reform.

## I. FROM ARMS RACE TO MARKETPLACE

In the late 1980s and early 1990s, many innovative high-tech companies did not file for patents.<sup>15</sup> By the turn of the millennium,

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12. See generally DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* (2009) (describing the industry-specific “macro” and “micro” policy levers that tailor the patent system to the needs of different industries).

13. See discussion *infra* Parts I.A.1–2, I.B.1.

14. This Article informs a larger body of work focused on the so-called “fourth pillar” of the patent system: patentees themselves. This Article treats patentee behavior not as the predetermined outcome of the patent system, but as an agent of change within the patent system, an independent force to be understood and harnessed. Colleen Chien, *The Patent System’s Fourth Pillar* (project in development); see also Colleen Chien, *Patent Amicus Briefs: What the Courts’ Friends Can Teach Us About the Patent System*, 1 U.C. IRVINE L. REV. (forthcoming 2011), draft available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1608111](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1608111) (exploring the shape and impact of one form of patentee behavior—amicus briefs filings at the Federal Circuit and Supreme Court).

15. See, e.g., Robert Greene Sterne et al., *The 2005 U.S. Patent Landscape for Electronic*

however, most had reversed stance and were filing for hundreds and even thousands of patents per year as part of the “patent arms race.”<sup>16</sup> In the last decade, the patent “marketplace,” and the patent-assertion entities commonly associated with it, have grown in prominence. Through their lawsuits and licensing demands, patent-assertion entities have changed the high-tech patent environment.<sup>17</sup> Part I provides a history of the patent arms race and patent marketplace, setting the stage for an exploration of the new complex patent ecosystem.

#### A. INTRODUCTION TO THE PATENT ARMS RACE

The defensive use of patents dates back to at least the turn of the century, when, according to one account, Henry Ford accumulated automobile patents in order to reduce the risk of being sued and to obtain the ability to operate freely, without ever having to enforce the company’s patents.<sup>18</sup> Filing for patents gave the Ford Motor Company

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*Companies*, in PRACTISING LAW INSTITUTE COURSE HANDBOOK SERIES: ANNUAL INSTITUTE ON COMPUTER & INTERNET LAW 3 (2005), available at <http://64.237.99.107/media/pnc/7/media.507.pdf> (“The 1980s saw an amazing business phenomena in the U.S. of creation of many start up electronic companies, some of which broke out of the pack of their competitors to become very large companies in their own right. Notable examples are Apple, Microsoft, Oracle, Cisco, Sun, [and] AOL . . . . As upstarts, these companies in general did not embrace patents in the slightest.”); see also KEVIN G. RIVETTE & DAVID KLINE, REMBRANDTS IN THE ATTIC: UNLOCKING THE HIDDEN VALUE OF PATENTS 41–42 (2000) (describing ignorance and antipathy towards software patents as among the reasons companies did not file for them).

16. See, e.g., RIVETTE & KLINE, *supra* note 15, at 4. (“[In 1990] Microsoft had one patent; [in 2000] it ha[d] close to 800. Sun, Oracle, Novell, Dell and Intel have likewise boosted the size of their patent portfolios by more than 500 percent just in the last few years.”); see also *Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy: Joint Hearings Before the Fed. Trade Comm’n & Dep’t of Justice* 674 (Feb. 28, 2002) [hereinafter *Competition FTC Hearing II*] (statement of Robert Barr, Vice President for IP and Worldwide Patent Counsel, Cisco Systems, Inc.), available at <http://www.ftc.gov/opp/intellect/020228ftc.pdf> (“Between 1984 and [19]93, the first [ten] years of the company, [Cisco] filed only one patent. . . . [In] 1994 the company had grown to over [\$1 billion] in annual revenue. This growth was obviously not fuelled [sic] by patents, it was fuelled [sic] by competition and by open, nonproprietary interfaces. But in 1994, the company . . . [started] a program to obtain more patents. . . . We filed six patents in 1994. . . . We increased each year . . . [and] we’re now [in 2002] filing over [750] patents a year.”).

17. Daniel P. McCurdy, *Patent Trolls Erode the Foundation of the U.S. Patent System*, SCI. PROGRESS, Fall & Winter 2008/2009, at 78, 78–79 (characterizing the emergence of “patent trolls” as representing the most significant and destabilizing change in the patent environment since 2003); see also Chris Coletta, *Red Hat Among Companies in Crosshairs of License Suit*, TRIANGLE BUS. J., May 16, 2008, <http://triangle.bizjournals.com/triangle/stories/2008/05/19/story13.html> (“Trolls are widely perceived . . . as the bane of the patent system.” (quoting Colleen Chien, Assistant Professor of Law, Santa Clara University) (internal quotation marks omitted)).

18. Harold C. Wegner & Stephen B. Maebius, *Patent Flooding: America’s New Patent Challenge* 11 (Spring 2002) (unpublished paper, George Washington Univ. Law School), available at [http://www.foley.com/files/tbl\\_s31Publications/FileUpload137/844/wegner\\_patentfloodingFTC.pdf](http://www.foley.com/files/tbl_s31Publications/FileUpload137/844/wegner_patentfloodingFTC.pdf) (“Ford’s successors maintained a defensive posture and proudly never enforced their patents. The relatively large number of patents obtained by Ford was matched by General Motors and other competitors. They all created a defensive patent pool that was used to permit everyone to operate, essentially, free from the patent system.”). This paper was also presented as part of the testimony of

the ability to trade rights with its competitors, and to prevent the technology from being patented by others.<sup>19</sup>

In the Parts that follow, I examine the history and practice of modern-day defensive patenting in high-tech industries in the context of three developments: the licensing campaigns of Texas Instruments (TI) and International Business Machines (IBM), the patent disputes between Kodak and Polaroid, and cross-licensing practices.

### I. *The Catalysts*

While eventually practiced industry-wide, the modern-day practice of defensive patenting was catalyzed by the actions of single companies—TI and IBM. In the mid-1980s, TI began an intensive licensing and litigation campaign to save the company from bankruptcy.<sup>20</sup> A decade and a half and an estimated \$4 billion later, it had achieved its corporate objective.<sup>21</sup> Along the way, it fundamentally changed how hardware companies approached patenting. In the mid-1990s, IBM began its own campaign to monetize the considerable patent portfolio it had built up over the years.<sup>22</sup> In the process of doing so, it “set off . . . a chain reaction”<sup>23</sup> in the software industry and ushered in a new era of software patenting and licensing. The following paragraphs describe these transitions.

TI’s domestic patent-licensing campaign was inspired by the company’s success in suing foreign competitors for patent infringement.<sup>24</sup>

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Stephen B. Maebius in joint hearings before the FTC and DOJ. The Supreme Court’s 1908 decision in *Continental Paper Bag v. Eastern Paper Bag Co.*, 210 U.S. 405, 429 (1908), establishing the lack of a working requirement, has also been credited with bolstering the ability of firms to patent defensively. DAVID C. MOWERY & NATHAN ROSENBERG, *PATHS OF INNOVATION: TECHNOLOGICAL CHANGE IN 20TH-CENTURY AMERICA* 17 (1998).

19. *Id.*

20. RIVETTE & KLINE, *supra* note 15, at 125 (“Texas Instruments . . . was reportedly saved from bankruptcy in the mid-1980s by an all-out patent licensing and litigation effort. In 1992 alone, TI earned \$391 million from patent licenses—43 percent more than its \$274 million in operating income for that year. Its current licensing revenues are thought to be about \$800 million a year. All told, analysts estimate that TI has earned more than \$4 billion in royalties since it began enforcing its patents in the mid-1980s.” (footnote omitted)).

21. *Id.*

22. JULIE L. DAVIS & SUZANNE S. HARRISON, *EDISON IN THE BOARDROOM: HOW LEADING COMPANIES REALIZE VALUE FROM THEIR INTELLECTUAL ASSETS* 80–81 exh.3.6 (2001) (statement of Jerry Rosenthal, Vice President, IBM).

23. Emery Simon, Counselor, Policy Council of the Bus. Software Alliance, Remarks at the Brookings Institute Panel on Software and Law: Is Regulation Fostering or Inhibiting Innovation? 15 (Dec. 7, 2005) [hereinafter *Brookings*], transcript available at <http://www.brookings.edu/comm/events/20051207software.pdf>; see also Sabrina Safrin, *Chain Reaction: How Property Begets Property*, 82 NOTRE DAME L. REV. 1917, 1921 (2007) (describing a “chain reaction theory” for why intellectual property rights, including through the patent “arms race,” have expanded).

24. Nicolas S. Gikkas, *International Licensing of Intellectual Property: The Promise and the Peril*, 1 J. TECH. L. & POL’Y 6, paras. 42–43 (1996) (describing TI’s 1986 International Trade Commission case against Asian Dynamic Random Access Memory manufacturers resulting in royalty payments of \$1.5 billion from 1986 through the first half of 1993); accord *Competition FTC Hearing II*, *supra* note 16, at



Thus, at first, the company's stance was adversarial, characterized by a willingness to pursue litigation.<sup>25</sup> However, over time, the company moved towards a licensing model,<sup>26</sup> signing non-exclusive licenses with major players in the industry.<sup>27</sup> TI supported these efforts with an expanding patent portfolio—from 1986 to 1995, it filed 3537 patents, more than doubling the number of applications it had filed in the previous decade.<sup>28</sup>

In the early 1990s, most software companies also had few patents.<sup>29</sup> IBM was an exception; as a hardware company, it had always applied for patents.<sup>30</sup> As one of the first companies to file for software patents,<sup>31</sup> IBM captured a quarter of the software patents issued between 1978 and 1988.<sup>32</sup> The company also pushed for development of the case law. Its appeal of a key USPTO decision led to a new form of claim, the *Beauregard* claim,<sup>33</sup> and the development of guidelines in the mid-1990s for the examination of computer-related inventions.<sup>34</sup> As part of a broader strategy within the company to patent aggressively, IBM reached its goal of top position in the patenting charts by 1993 and has

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653 (statement of Fred Telecky, Senior Vice President and General Patent Counsel, Texas Instruments, Inc.) (describing TI's campaign of suing Japanese and Korean semiconductor companies in response to competitive threats and leading to the company's patent licensing program).

25. Kristopher Boushie & Christopher Spadea, *To Maximise IP Value a Company Needs the Right Culture*, INTELL. ASSET MGMT., Nov./Dec. 2003, at 22, 22–23 (“Another very conscious shift was in TI's willingness to pursue litigation.”).

26. *Id.*

27. Harold C. Wegner, *Patent Reform “Quality” and “Pendency”: Drilling Down to “Backlog”, “Deferred Examination”, “Patent Worksharing” and Other Integers to Achieve Primary Goals*, 2011 STAN. TECH. L. REV. (forthcoming 2011) (manuscript at 18), available at <http://www.grayonclaims.com/storage/StanfordFeb26versJan18.pdf>.

28. TI Patents from 1986–1995, USPTO PATENT FULL-TEXT & IMAGE DATABASE, <http://patft.uspto.gov/netahtml/PTO/search-adv.htm> (search string “AN/“texas instruments” AND ISD19760101->19851231” in the query form yields 1639 patents while “AN/“texas instruments” AND ISD19860101->19951231” yields 3537).

29. *Brookings*, *supra* note 23; see also *Use of the Patent System to Protect Software-Related Inventions: Hearing Before the U.S. Patent & Trademark Office* 17 (Jan. 26, 1994) (statement of Douglas K. Brotz, Principal Scientist, Adobe Systems Inc.) (“[W]hen we at Adobe founded a company [in 1982] on the concept of software to revolutionize the world of printing, we believed that there was no possibility of patenting our work. That belief did not stop us from creating that software, nor did it deter the savvy venture capitalists who helped us with the early investment. We have done very well despite our having no patents on our original work.”).

30. DAVIS & HARRISON, *supra* note 22 (“We have been filing for patents for about 100 years, literally since the company was founded.”).

31. The era of software patenting was ushered in in large part by the Supreme Court's decision in *Diamond v. Diehr*, 450 U.S. 175, 192–93 (1981), that a rubber-curing process comprised patentable subject matter. See, e.g., Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 EMORY L.J. 1025, 1093 (1990).

32. ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, *PATENT LAW AND POLICY: CASES AND MATERIALS* 155 n.9 (3d ed. 2002).

33. See *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995); see also Victor Siber & Marilyn Smith Dawkins, *Claiming Computer-Related Inventions as Articles of Manufacture*, 35 IDEA 13–15 (1994).

34. MERGES & DUFFY, *supra* note 32, at 155 n.10.

remained there since.<sup>35</sup> Around that time, the company decided to expand its patent licensing efforts, which had focused primarily on hardware,<sup>36</sup> and to make IBM's patent portfolio into a "profit center."<sup>37</sup> In subsequent years, IBM launched an aggressive and successful licensing campaign that brought in over \$1 billion in revenue annually by 2003.<sup>38</sup>

By the late 1990s, many high-tech companies "had been stung by patent suits . . . and by cross license [sic] programs from IBM and other more established competitors that required significant royalty payments."<sup>39</sup> As companies grew tired of paying royalties for access to the patent portfolios of IBM and TI, they developed their own.<sup>40</sup> The rate of semiconductor patenting per research and development ("R&D") dollar doubled between 1985 and 1995.<sup>41</sup> More dramatically, software patents, as a share of overall patents, increased more than seven-fold, from 2% in the early 1980s to 15% of patents by 2002.<sup>42</sup> This growth appears to have resulted more from the importance of acquiring patents than to an increase in the amount of R&D spending.<sup>43</sup>

## 2. *Demonstration Effects*

Demonstration effects, that is, behavioral changes caused by observing others, also caused firms to adopt portfolio patenting strategies. A lawsuit initiated in 1976, and finally settled in 1990, by Polaroid against Kodak had a particularly profound impact.<sup>44</sup> As semiconductor companies watched Kodak pay Polaroid nearly \$1 billion

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35. MARSHALL PHELPS & DAVID KLINE, *BURNING THE SHIPS: INTELLECTUAL PROPERTY AND THE TRANSFORMATION OF MICROSOFT* 24–25 (2009) (describing IBM's corporate strategy).

36. DAVIS & HARRISON, *supra* note 22; *see also Brookings*, *supra* note 23.

37. Sterne et al., *supra* note 15, at 5.

38. *Id.*; *see also* CHETAN SHARMA, *WHAT IS YOUR PATENT PORTFOLIO QUOTIENT (PPQ)?* 3 n.2 (2007), available at <http://www.chetansharma.com/What%20is%20your%20Patent%20Portfolio%20Quotient.pdf>.

39. Sterne et al., *supra* note 15, at 3.

40. *See, e.g., The Evolving IP Marketplace: The Operation of IP Markets: Hearing Before the Fed. Trade Comm'n* 82 (Mar. 18, 2009) [hereinafter *Evolving Marketplace I*] (statement of Russ Slifer, Chief Patent Counsel, Micron Technologies, Inc.), available at <http://www.ftc.gov/bc/workshops/ipmarketplace/mar18/090318transcript.pdf> ("[In the] late '70s, early '80s, we were somewhat late to the game, if you will . . . . There was already an awful lot of innovation from Texas Instruments, IBM and others in a large patent portfolio, so we found ourselves in a position where[,] to be able to participate in the industry, we had to pay license fees to those companies, and we did so. As we were paying those fees and innovating our own technology, we sought our own patent portfolio as the technology advanced. We acquired a fairly substantial patent portfolio based on strong innovation, which allowed us to enter into cross-licensing agreements with other manufacturers.").

41. *Competition FTC Hearing II*, *supra* note 16, at 660 (statement of Bronwyn Hall, Professor of Economics, University of California, Berkeley) ("[T]he semiconductor industry had a patenting rate per R&D dollar which doubled over about 10 years. In other words, the patenting rate had gone up enormously between 1985 and 1995.").

42. Bessen & Hunt, *supra* note 1, at 47 tbl.1.

43. *Id.* at 23 ("Thus the majority of the growth in software patenting is not attributed to any of [a variety of factors including R&D intensity] and can be attributed, instead, to rapidly rising patent propensity.").

44. Hall & Ziedonis, *supra* note 1, at 109.

in damages, pay Polaroid's customers and lawyers another \$600 million, and shut down its instant camera business, including a manufacturing plant, at a cost of \$1.5 billion and 700 employees,<sup>45</sup> they became "really scared."<sup>46</sup> This case illustrated the substantial business risks, including the threat of injunction, associated with patent infringement.<sup>47</sup> This particular lawsuit, as well as the patent-licensing campaigns of TI, had a profound impact on shaping firm strategies.<sup>48</sup>

TI's campaigns inspired not only fear, but awe within the IP community. The company, led by the "genius of Richard Donaldson," demonstrated the considerable rewards that mining a corporate patent portfolio could yield.<sup>49</sup> According to "folklore, . . . payments [from TI's lawsuits] kept TI profitable for 5 straight quarters . . . [despite] significant sales los[s]es due to foreign competition."<sup>50</sup> This and related developments prompted companies to take a second look at their own patent portfolios.<sup>51</sup> The books *Rembrandts in the Attic* and *Edison in the Boardroom*, which detailed the patent successes and failures of various companies,<sup>52</sup> provided guides.

### 3. Patent Portfolios for Cross-Licensing

As companies grew their patent portfolios, many followed a variant of the "patenting anything" approach.<sup>53</sup> In the words of its general counsel, for example, the software company Borland "filed patents on virtually everything."<sup>54</sup> Companies also used filing targets to try to build a

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45. RIVETTE & KLINE, *supra* note 15, at 93–96.

46. *Competition FTC Hearing II*, *supra* note 16, at 662 (statement of Bronwyn Hall, Professor of Economics, University of California, Berkeley) ("And the second demonstration effect . . . was the Kodak-Polaroid case. Even though that wasn't in their industry, they saw the injunction and the shutdown of the business, of Kodak's instant camera business, and that really scared them, because that was much more expensive than just having to pay past royalties.").

47. Hall & Ziedonis, *supra* note 1, at 109.

48. *Id.*

49. Wegner & Maebius, *supra* note 18, at 15–16.

50. Sterne et al., *supra* note 15, at 4; *accord* Hall & Ziedonis, *supra* note 1, at 109 ("[Our industry participant] interviewees were well aware of the strategies that Texas Instruments had put in place to manage—and profit from—its patent portfolio . . .").

51. Hall & Ziedonis, *supra* note 1, at 109.

52. *See generally* DAVIS & HARRISON, *supra* note 22, (devoting chapter six to a case study of Dow Chemical Company); RIVETTE & KLINE, *supra* note 20 (describing the patent strategies of, for example, IBM, Texas Instruments, and Xerox).

53. Sterne et al., *supra* note 15, at 22–23 (describing a "patenting anything and everything" approach and explaining that the trigger for this rapid accumulation, in turn, was often the growth of a company to the point that it could be on the radar of an IBM or TI).

54. *Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy: Joint Hearings Before the Fed. Trade Comm'n & Dep't of Justice* 351 (Feb. 27, 2002) [hereinafter *Competition FTC Hearing I*] (statement of Robert Kohn, Vice-Chairman of the Board and Director, Borland Software Corp.), available at <http://www.ftc.gov/opp/intellect/020227trans.pdf>.

portfolio of a certain size<sup>55</sup> and benchmarked their portfolios against others in order to determine how many patents to file.<sup>56</sup>

In negotiations over complex technologies, parties focused on the quantity rather than the quality of patents in a portfolio. According to the infamous “ruler” methodology, “you would bring your stack and you’d bring a ruler, and you’d put each stack next to each other and you’d take a ruler and you measure the relative heights of the stack. And some algorithm would tell you the number.”<sup>57</sup> Or, companies might examine a few patents representative of each portfolio during a cross-licensing negotiation, but very rarely during a cross-licensing negotiation was each patent scrutinized individually. As general counsel of TI famously put it, “for [TI] to know what’s in [its patent] portfolio, we think, is just a mind-boggling, budget-busting exercise to try to figure . . . out with any degree of accuracy at all.”<sup>58</sup> The high cost of evaluating which patents in a portfolio of thousands might apply to each product, the likelihood of the patents’ validity, the appropriate royalty rate, and the appropriate base from which to calculate the royalty has led patent licenses to be “negotiated en masse.”<sup>59</sup> Portfolio cross-licensing, based on quantity and other proxies of coverage, has simply proven to be more efficient than the alternative.

This licensing dynamic has spurred the growth of defensive patenting, the filing of patents in order to gain freedom to operate,<sup>60</sup> for the specific purposes of maintaining patent peace, obtaining access to the technology of others, and neutralizing patent lawsuits.<sup>61</sup> As the general

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55. *Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy: Joint Hearing Before the Fed. Trade Comm’n & Dep’t of Justice* 33 (Mar. 20, 2002) [hereinafter *Competition FTC Hearing III*] (statement of Richard Thurston, Vice President and General Counsel, Taiwan Semiconductor Manufacturing Co.), available at <http://www.ftc.gov/opp/intellect/020320trans.pdf> (“Our goal now is to file about 500 patents a year . . . largely for defensive purposes.”).

56. Sterne et al., *supra* note 15, at 22 (describing a benchmarking approach based on patents issued and revenue).

57. *The Evolving IP Marketplace: The Operation of IP Markets: The IP Marketplace in the IT Industry: Hearing Before the Fed. Trade Comm’n* 132 (May 4, 2009) [hereinafter *Evolving Marketplace III*] (statement of Ron Epstein, Chief Executive Officer, Ipotential, LLC), available at <http://www.ftc.gov/bc/workshops/ipmarketplace/may4/090504transcript.pdf>.

58. *Competition FTC Hearing II*, *supra* note 16, at 743 (statement of Fred Telecky, Senior Vice President and General Patent Counsel, Texas Instruments Corp.).

59. Kahin, *supra* note 6, at 9; see, e.g., *Tex. Instruments v. Hyundai Elecs. Indus.*, 49 F. Supp. 2d 893, 901 (E.D. Tex. 1999) (“[I]t is almost impossible on a patent-by-patent, country-by-country, product-by-product basis to determine whether someone is using a company’s patents.”).

60. See, e.g., FED. TRADE COMM’N, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY 33 (2003), available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf> (“Defensive patenting is primarily motivated by a desire to ensure freedom to operate and includes the use of patents as bargaining chips in cross-licensing negotiations.” (internal quotation marks omitted)).

61. *Id.* at 52 (“[F]irms pursue defensive patenting: (1) to maintain detente with rivals; (2) to obtain portfolio cross-licenses from rivals; and (3) to raise a patent infringement counter-claim should a rival sue . . .”). Defensive patenting is practiced in other countries as well. See, e.g., DIETMAR

counsel of semiconductor foundry Taiwan Semiconductor Manufacturing Company commented, “[s]ometimes the ability to throw 20, 50 good patents against someone . . . does enable the scales to be a little bit better balanced, especially as you’re playing a catch-up game . . . .”<sup>62</sup>

Large portfolios have spawned the development of other large portfolios. Parchomovsky and Wagner describe this as a “feedback effect, whereby low-quality patents (organized into ever-larger portfolios) beget even more low-quality patents.”<sup>63</sup> To improve their bargaining position in cross-licensing, companies engage in “portfolio maximization,” the practice of growing their patent portfolios in number and breadth.<sup>64</sup> In pursuit of the patent arms race, companies have devoted considerable financial and technical resources to patenting,<sup>65</sup> in some cases, even acting in opposition to their own corporate philosophies<sup>66</sup> and, arguably, their self-interest.<sup>67</sup>

HARHOFF, ET AL., INNO-TEC, THE STRATEGIC USE OF PATENTS AND ITS IMPLICATIONS FOR ENTERPRISE AND COMPETITION POLICIES 253 (2007), available at [www.en.inno-tec.bwl.uni-muenchen.de/research/proj/laufendeprojekte/patents/stratpat2007.pdf](http://www.en.inno-tec.bwl.uni-muenchen.de/research/proj/laufendeprojekte/patents/stratpat2007.pdf) (describing portfolio maximization strategies in Europe); Sachiko Hirao, *Japanese Firms Urged to Better Protect Patents*, JAPAN TIMES ONLINE, Nov. 8, 2001, <http://search.japantimes.co.jp/cgi-bin/nn20011108b1.html> (reporting on a 1999 survey by the Japan Intellectual Property Association in which approximately 80% of member companies claimed that the purpose of their patents was defensive).

62. *Competition FTC Hearing III*, *supra* note 55, at 33 (statement of Richard Thurston, Vice President and General Counsel of Taiwan Semiconductor Manufacturing Co.).

63. R. Polk Wagner, *Understanding Patent Quality Mechanisms*, 157 U. PA. L. REV. 2135, 2155 (2009); see also generally Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U. PA. L. REV. 1 (2005).

64. HARHOFF ET AL., *supra* note 61, at 9–10. Of course, large portfolios can be used for not just defensive, but also potentially anticompetitive purposes, including patent “flooding,” in which a dominant firm files for a large number of patents in order to deter entry into the market by rivals or by forcing cross-licensing of core technology. ORG. FOR ECON. CO-OPERATION & DEV., COMPETITION POLICY ROUNDTABLES: COMPETITION, PATENTS AND INNOVATION (II) 16–17 (2009), available at <http://www.oecd.org/dataoecd/26/33/45019987.pdf>.

65. See, e.g., *Public Hearing on Use of the Patent System to Protect Software-Related Inventions: Hearing Before the U.S. Patent & Trademark Office* 48–50 (Jan. 26, 1994) (statement of Jim Warren, Director, Autodesk, Inc.), transcript available at <http://www.uspto.gov/web/offices/com/hearings/software/sanjose/sjhrng.pdf>; see also *Competition FTC Hearing II*, *supra* note 16, at 677–78 (statement of Robert Barr, Vice President for IP and Worldwide Patent Counsel, Cisco Systems, Inc.); *Competition FTC Hearing I*, *supra* note 54, at 376 (statement of Jordan Greenhall, Chief Executive Officer, Divx Networks) (“I have now issued a directive that we reallocate roughly 20 to 35 percent of our developer’s resources and sign on two separate law firms to increase our patent portfolio to be able to engage in the patent spew conflict.”).

66. *Competition FTC Hearing II*, *supra* note 16, at 713 (statement of Robert Barr, Vice President for IP and Worldwide Patent Counsel, Cisco Systems, Inc.) (“[W]e’ve entered this game five, six years ago in full force for the wrong reason and we’re contributing to the proliferation to mutually assured destruction.”).

67. As Polk Wagner argues, “even if most firms would be better off with high-quality patents (and fewer of them), adopting such a strategy in the face of others’ more numerous (and lower quality) patents is disadvantageous. Thus firms maintain the suboptimal strategy.” Wagner, *supra* note 63.

The hope, of course, is that patent stockpiles will bring about a “patent peace,” in which companies agree to license to,<sup>68</sup> or perhaps to ignore, each other entirely.<sup>69</sup> This would give portfolio-holders the freedom to operate without having to worry about being sued, despite likely widespread infringement throughout the industry.

## B. THE PATENT MARKETPLACE

Over the last several years, another paradigm has risen to prominence within the patent system. The growth of the patent marketplace, in which patents can be bought, sold, and traded, has created new opportunities and obstacles for patentees. The Federal Trade Commission (FTC) convened a series of public hearings from 2008 to 2009 to explore this development and its impact on innovation and competition.<sup>70</sup> Justices of the U.S. Supreme Court have cited the growth of an industry “in which firms use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees” as a reason to change patent law.<sup>71</sup> Suits brought by patent-assertion entities have spurred calls for congressional patent reform to curtail the ability of patent plaintiffs to sue in inconvenient venues and to limit the recovery of damages.<sup>72</sup> These events herald the recent, historic evolution of the patent market.

### I. History

Patents have long been bought and sold.<sup>73</sup> In her study of the early American patent system, Zorina Kahn finds that patents were assigned

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68. *Brookings, supra* note 23 (“The practice generally in the technology industry with respect to patents is not so much to license for cash, ‘You can use my invention for \$12.95.’ It’s much more of a cross-licensing pattern, ‘So I have a few patents, you have a few patents, and we’ll license each other.’”).

69. *Survey: The Arms Race*, *ECONOMIST*, Oct. 22, 2005, at 10, 10 (“The best that can happen is nothing happens.” (quoting Joe LaSala, General Counsel of Novell)).

70. *FTC Workshop: The Evolving IP Marketplace*, FED. TRADE COMM’N, <http://www.ftc.gov/bc/workshops/ipmarketplace/> (last visited Dec. 17, 2010).

71. *eBay, Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 396 (2006) (Kennedy, J., concurring) (“In cases now arising, trial courts should bear in mind that in many instances the nature of the patent being enforced and the economic function of the patent holder present considerations quite unlike earlier cases. An industry has developed in which firms use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees. For these firms, an injunction, and the potentially serious sanctions arising from its violation, can be employed as a bargaining tool to charge exorbitant fees to companies that seek to buy licenses to practice the patent.” (citation omitted)).

72. *See, e.g., Patent Reform Act of 2009: Hearing on H.R. 1260 Before the H. Comm. on the Judiciary*, 111th Cong. 94–95 (2009) (statement of Mark Chandler, General Counsel and Senior Vice President, Cisco Systems, Inc.), <http://www.patentfairness.org/pdf/Chandler%20Testimony%20Cisco%20043009.pdf> (last visited Dec. 17, 2010) (“[Current] protections . . . are not effective against NPEs. Far from deterring the filing of such claims, the current rules [] encourage patent-holding entities to pursue [] opportunistic lawsuits.” (emphasis omitted)).

73. B. ZORINA KAHN, *THE DEMOCRATIZATION OF INVENTION: PATENTS AND COPYRIGHTS IN AMERICAN ECONOMIC DEVELOPMENT, 1790–1920*, at 155 & n.50 (2005) (describing how, in 1878, Maria

during this period in order to “market and commercialize the invention,” among other reasons.<sup>74</sup> In modern times, companies have bought IP in order to support their product strategies<sup>75</sup> and to seed new product development opportunities.<sup>76</sup>

In recent years, the proliferation of companies focused on the assertion, rather than the commercialization, of patents they acquire has created a new class of patent buyers.<sup>77</sup> This same period has witnessed a growth in the strategic management of patents. These developments have fueled growth in the patent marketplace, accompanied by an increase in liquidity, transactions, and business models for buyers, sellers, and intermediaries.<sup>78</sup>

The growth of the patent marketplace, just like the patent arms race, has been spurred by examples set by key actors in the patent system. One of them was the prolific independent inventor Jerome Lemelson, who was granted over 600 patents covering a wide variety of technologies.<sup>79</sup> In the 1980s and 1990s, Lemelson signed licenses with approximately a thousand companies,<sup>80</sup> earning him billions of dollars<sup>81</sup> and the title of “patent troll.”<sup>82</sup> These campaigns provided a model for

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Beasley sold rights over her patented footwarmer to Osborn Conrad of Philadelphia, a few months after the patent issued, and how she also agreed to transfer half of the rights in an unfinished invention to James Henry of Philadelphia in exchange for funds to finish it).

74. *Id.*

75. RIVETTE & KLINE, *supra* note 15, at 71 (describing IP-enabled “grow” strategies in which the purchase or development of intellectual property is used to support new product lines or expansion into new markets).

76. *The Evolving IP Marketplace: The Operation of IP Markets: Hearing Before the Fed. Trade Comm’n* 39–40 (Apr. 17, 2009) [hereinafter *Evolving Marketplace II*] (statement of Jim Malackowski, President and Chief Executive Officer, Ocean Tomo, LLC), available at <http://www.ftc.gov/bc/workshops/ipmarketplace/apr17/transcript.pdf> (describing early markets, such as Yet2.com, as being focused on selling new product development opportunities).

77. Chien, *supra* note 5.

78. Lew Zaretski, *Rising Prices and Changing Strategies*, INTELL. ASSET MGMT., Feb./Mar. 2008, at 61, 61.

79. *Jerome Lemelson’s Patents*, SMITHSONIAN LEMELSON CTR., [http://invention.smithsonian.org/about/about\\_patents.aspx](http://invention.smithsonian.org/about/about_patents.aspx) (last visited Dec. 17, 2010); see also *A Special Tribute to: Jerome Lemelson*, AM.’S INVENTOR ONLINE, <http://www.inventionconvention.com/americaninventor/dec97issue/section16.html#Friday> (last visited Dec. 17, 2010).

80. Mary Waldron, *The Patent Prosecution Pioneer: Intellectual Property Attorney Gerald Hosier*, LAW CROSSING, <http://www.lawcrossing.com/article/pdf/3445.pdf> (last visited Dec. 17, 2010) (“To date, Hosier has retrieved about \$1.5 billion from more than 950 companies for Jerome Lemelson and his estate.”).

81. *Id.*

82. Bernard H. Chao, *After eBay Inc. v. MercExchange: The Changing Landscape for Patent Remedies*, 9 MINN. J. L. SCI. & TECH. 543, 558 n.74 (2008); see also Adam Goldman, *Some Claim Inventor Lemelson a Fraud*, USATODAY, Aug. 21, 2005, [http://www.usatoday.com/tech/science/discoveries/2005-08-21-lemelson-fraud\\_x.htm](http://www.usatoday.com/tech/science/discoveries/2005-08-21-lemelson-fraud_x.htm). Although Jerome Lemelson’s patent enforcement campaigns predated those of others, he was not the first opportunistic licensor. See Gerard N. Magliocca, *Blackberries and Barnyards: Patent Trolls and the Perils of Innovation*, 82 NOTRE DAME L. REV. 1809, 1811 (2007) (describing nineteenth century “patent sharks,” who bought dormant patents

suing practicing companies that has since been followed by many independent inventors.<sup>83</sup> They also popularized the contingent-fee arrangement Lemelson had with his attorney, Gerald Hosier. The hundreds of millions of dollars in fees earned by Hosier have led others to describe him as an “awe-inspiring” pioneer in the legal field, due to his innovative legal approach,<sup>84</sup> and to follow in his footsteps.<sup>85</sup>

The patent holding company Intellectual Ventures (“IV”), led by Nathan Myhrvold, has also played a seminal role in the development of the patent marketplace. In order to carry out its stated objective of building a capital market for inventions,<sup>86</sup> IV has acquired at least 30,000 patents from a diverse set of IP owners.<sup>87</sup> According to one account, “it is rare to meet an IP owner who has not received an inquiry from IV. Even when an owner does not sell to IV, the experience educates them and as a result they sometimes enter the market later.”<sup>88</sup> As such, IV has had a tremendous influence in developing the market, not only through its transactions, but also by raising awareness of the opportunities offered by the patent marketplace.

While transactions in the secondary market are hard to track systematically, the patents offered in public auctions have generally covered high-tech inventions.<sup>89</sup> This is likely due to their historical source (defunct startups), the density of patents covering high-tech products, and the ease with which patents in high-tech areas can be filed without actually making the invention.<sup>90</sup>

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and used them to sue farmers).

83. Wegner & Maebius, *supra* note 18, at 13 (describing the mold-breaking Jerome Lemelson paradigm of an inventor outside the industry suing within the industry).

84. Waldron, *supra* note 80.

85. Brenda Sandburg, *You May Not Have a Choice. Trolling for Dollars*, RECORDER (July 30, 2001), <http://www.phonetel.com/pdfs/LWTrolls.pdf> (“[Gerald Hosier is] the best-known lawyer in the patent-enforcement industry.”).

86. Myhrvold, *supra* note 3.

87. *Id.* This number does not include patent applications, which are likely to be numerous. *See, e.g.*, AVANCEPT, A STUDY OF: THE INTELLECTUAL VENTURES PORTFOLIO IN THE UNITED STATES: PATENTS & APPLICATIONS 6 (2d ed. 2010) (on file with the author) (estimating IV’s portfolio, at the end of 2009, to include at least 25,000 to 50,000 patents/applications and possibly even more patent assets).

88. Zaretzki, *supra* note 78, at 62; *see also* Carlyn Kolker, *Billion-Dollar Lawyer Desmarais Quits Firm to Troll for Patents*, BUS. WK. (June 1, 2010, 12:04 AM EDT), <http://www.businessweek.com/news/2010-06-01/billion-dollar-lawyer-desmarais-quits-firm-to-troll-for-patents.html>; Jeff Kuester & Brett Bartel, *Evolution of the IP Market*, INTELL. ASSET MGMT., Sept./Oct. 2009, at 30, 32 (“IV . . . has ‘represented half of the purchasing market for US patents over the last few years’ [as of 2009].” (quoting Steven Hoffman, Chief Executive Officer, ThinkFire)).

89. *See, e.g.*, analysis reported *infra* note 110 (describing the top sellers in Ocean Tomo auctions as being Sun, AT&T, and IBM).

90. *See, e.g.*, Chien, *supra* note 5, at 1580 (describing the reasons non-practicing entities have focused on high-tech inventions).



## 2. *Actors in the Patent Marketplace*

The patent marketplace includes patent buyers, patent sellers, and the intermediaries that facilitate transactions between them. In the following subparts, I describe members of the patent ecosystem in terms of their relationship to the patent marketplace. The general roles and strategies of various practicing and non-practicing companies are described later, in Part II.

### a. *Sellers*

While the total volume of patent sales has not been studied systematically, a number of patent “pathways” are familiar. A university exclusively licenses or assigns its patents to a university spinoff.<sup>91</sup> A company files for bankruptcy and sells its patents in the resulting fire sale.<sup>92</sup> A large company sells a dying business line and the patent assets along with it, or simply donates or sells patents it is no longer using.<sup>93</sup> Patents often have longer shelf-lives than the products, strategies, and even companies they are initially obtained to support. In the patent system, patents are owned by corporations, universities, nonprofits, small businesses, individuals, and the government.<sup>94</sup> All of these types of entities have sold their patents in the marketplace through public auction<sup>95</sup> and private transaction.<sup>96</sup>

The patent marketplace has developed an association with patent-assertion entities, or “trolls.” For this reason, selling into patent markets has for some time been considered an “anathema or unforgivable sin for large corporations.”<sup>97</sup> Recently, however, attitudes have changed. Corporations have large numbers of assets that are unlikely ever to be

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91. See, e.g., Richard Brandt, *Net Assets: How Stanford's Computer Science Department Changed the Way We Get Information*, STANFORD MAG., Nov./Dec. 2004, at 46, 50 (describing the Stanford patent that Google was founded to develop and commercialize).

92. For example, Commerce One sold its web services patent portfolio during bankruptcy proceedings, in 2004, to Novell. Robert Cover, *Commerce One Auctions Web Services Patents*, COVER PAGES (Nov. 17, 2004), <http://xml.coverpages.org/CommerceOnePatents.html>. The patents may also be auctioned on eBay. See, e.g., Adam Jones, *Looking to Sell Your Patent Portfolio? Put It on eBay*, IP LAW BLOG (Oct. 26, 2005), <http://www.theiplawblog.com/archives/-patent-law-looking-to-sell-your-patent-portfolio-put-it-on-ebay.html> (describing patents for sale on eBay).

93. David Hetzel & Kirk Dailey, *Shooting the Patent Divestiture Rapids*, INTELL. ASSET MGMT., Feb./Mar. 2008, at 13, 13–18 (describing various reasons companies divest their patent assets).

94. See, e.g., John R. Allison & Mark A. Lemley, *Who's Patenting What? An Empirical Exploration of Patent Prosecution*, 53 VAND. L. REV. 2099, 2116–17 (2000) (describing this diversity of patent owners).

95. OCEAN TOMO, OCEAN TOMO 2007/2008 AUCTION GUIDES (2008) (on file with the author) (describing offerings from entities including NASA, The University of California, AT&T, 3Com, Boeing, Free Publication Systems, Inc., and a number of individual inventors).

96. Myhrvold, *supra* note 3, at 48–49 (describing IV as acquiring patents from these sources).

97. *Evolving Marketplace III*, *supra* note 57, at 95.

used and are expensive to maintain.<sup>98</sup> To dispose of these assets, many companies are turning to the patent marketplace.<sup>99</sup>

IV has stated that a “good number of the patents we buy come from large, healthy companies,” including over 100 Fortune 500 companies.<sup>100</sup> Acacia has been engaged by “large companies looking to turn their patents into revenue.”<sup>101</sup> In an analysis of all the patent lots offered for sale during Ocean Tomo auctions from Fall 2006 to Spring 2009, nearly half originated from practicing companies,<sup>102</sup> and almost a quarter of them (125 out of 511) were offered by public companies.<sup>103</sup> Among public companies, Sun listed the most lots, at thirteen, followed by IBM at ten and AT&T at eight; household names Dow Chemical, 3Com, and Motorola also listed patents.<sup>104</sup> The marketplace has provided a path to liquidity not only for startups and individuals, but for corporations including Philips Electronics, Siemens AG, Ford Motors, and Kimberly-Clark.<sup>105</sup>

#### b. Buyers

Patent buyers are motivated by a diverse set of concerns. The two largest buyers of patents in the patent marketplace in the recent past—IV<sup>106</sup> and John Desmarais<sup>107</sup>—do not practice their patents. In the recent past, approximately 90% of the patents sold in public auction have been

98. The reasons for and implications of which are discussed *infra* Parts II–IV.

99. *Evolving Marketplace II*, *supra* note 76, at 42–43 (statement of Steven J. Hoffman, Chief Executive Officer of ThinkFire) (“[T]he number of large corporations that have started to consider selling their portfolios or at least part of their portfolios has dramatically increased over the last couple of years.”); *id.* at 44 (statement of Marcus Delgado, Chief IP Counsel, Cox Communications, Inc.) (“[J]ust looking at Ocean Tomo’s markets, I have followed the lot since they began offering those patents at auction, and you can see the progression from smaller independent inventors to very sophisticated companies now that provide their patents to that auction pool . . .”).

100. Myhrvold, *supra* note 3, at 49.

101. ACACIA TECHS., LLC, ACACIA TECHNOLOGIES: LEADER IN PATENT LICENSING AND ENFORCEMENT 3, <http://acaciatechnologies.com/docs/CorporateBrochure.pdf> (last visited Dec. 17, 2010).

102. Tom Ewing, *Inside the World of Public Auctions*, INTELL. ASSET MGMT., July/Aug. 2010, at 63, 63.

103. Based on catalogs from the Fall 2006, Spring 2007, Fall 2007, Spring 2008, Fall 2008, and Spring 2009 auctions obtained from [www.oceantomo.com](http://www.oceantomo.com). Independent analysis is on file with the Author and copies of the catalogues are on file with the *Hastings Law Journal*.

104. OCEAN TOMO, OCEAN TOMO FALL 2008 LIVE IP AUCTION CATALOGUE 64 (2008) (3Com); OCEAN TOMO, SPRING 2006 LIVE PATENT AUCTION 137 (2006) (Motorola).

105. OCEAN TOMO, OCEAN TOMO FALL 2008 LIVE IP AUCTION CATALOGUE 266 (2008) (Phillips); OCEAN TOMO, OCEAN TOMO AUCTIONS: FALL 2007 CATALOGUE 223 (2007) (Kimberly-Clark); OCEAN TOMO, SPRING 2006 LIVE PATENT AUCTION 139 (2006) (Ford Motors). *See generally* OCEAN TOMO, OCEAN TOMO FALL 2006 INTELLECTUAL PROPERTY AUCTION 3 (2006).

106. Zaretzki, *supra* note 78, at 63; *see also* Ewing, *supra* note 102, at 63–64 & fig.1 (describing IV as buying 75.8% of publicly auctioned patent lots); Kolker, *supra* note 88; Kuester & Bartel, *supra* note 88, at 32 (“IV . . . has ‘represented half of the purchasing market for US patents over the last few years’ [as of 2009].” (quoting Steven Hoffman, Chief Executive Officer, ThinkFire)).

107. Kolker, *supra* note 88.

purchased by non-practicing entities—an estimated 75% by IV and the remainder by other non-practicing entities.<sup>108</sup>

Practicing companies also purchase patents in the patent marketplace; however, they appear to be more interested in selling patents than in buying them, because while they have supplied half of the lots available in public auction, they have purchased only about 11% of the lots sold.<sup>109</sup> This number likely underrepresents the share of total patents sold to practicing companies on the public and private market, as practicing companies may prefer to buy in the private market, where they have better control over the amount of information available to competitors and to the public.<sup>110</sup>

Still, practicing companies historically have developed their own IP, rather than acquire it from others, and most view IP management as ancillary to their core business of making and selling products and services. In addition, patents are unique assets; “[t]he typical operating company will be looking for patents satisfying some very specific characteristics, and the odds that such a patent will be waiting for them are slim.”<sup>111</sup> This may explain why, according to patent brokerage firm ThinkFire, most firms are “inactive” with respect to the patent market.<sup>112</sup> While some companies intermittently pursue transactions on an ad hoc basis and a few have “evolving” patent transaction capabilities, the fewest number perform significant transactions on a regular basis.<sup>113</sup> Still, if the right patents are available, it may be faster and administratively easier to acquire them on the market, rather than to file applications and wait for them to mature into patents. Patents for sale may have an early priority date and can be used to fill gaps in a company’s patent portfolio.

### c. Intermediaries

Many intermediaries have developed to help buyers and sellers find each other.<sup>114</sup> Ocean Tomo conducted public IP auctions between 2006

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108. See sources cited *supra* note 106.

109. Ewing, *supra* note 102, at 64.

110. The assets available in public auction are perceived to be of higher quality than assets otherwise available on the market. *Id.* at 66 (calling patent auction assets “generally higher” quality than patent assets from other sources).

111. *Id.* at 66.

112. ThinkFire, Presentation at the Berkeley Center for Law and Technology Conference: Patent Valuation Conference 16 (Feb. 6, 2008), available at <http://www.law.berkeley.edu/files/zaretzki.pdf>.

113. *Id.*

114. For a comprehensive and in-depth summary, see Raymond Millien & Ron Laurie, *Meet the Middlemen*, INTELL. ASSET MGMT., Feb./Mar. 2008, at 53, 55; see also Peter Detkin, Founder & Vice Chairman, Intellectual Ventures, Presentation at the Federal Trade Commission’s Hearings: The Evolving IP Marketplace: The Operation of IP Markets 11 (Dec. 5, 2008), presentation available at <http://www.ftc.gov/bc/workshops/ipmarketplace/dec5/docs/pdetkin.pdf>; Raymond Millien, Chief Executive Officer, PCT Capital, LLC, Presentation at the Federal Trade Commission’s Hearings: The Evolving IP Marketplace: The Operation of IP Markets 8–9 (Dec. 5, 2008), presentation available at <http://www.ftc.gov/bc/workshops/ipmarketplace/dec5/docs/rmillien.pdf> (describing seventeen different

and 2009<sup>115</sup> but sold its auction unit to British brokerage ICAP in 2009.<sup>116</sup> In the past, PL-X<sup>117</sup> and TAEUS have also offered online web auction capabilities.<sup>118</sup> While public auctions comprise the most visible type of trading platform, the vast majority of transactions are conducted in private—either by direct sale, brokered private sale, or private auction.<sup>119</sup> Agent/brokers like iPotential and ThinkFire help patent sellers find patent buyers or licensees by directly marketing to potential buyers or licensees.<sup>120</sup> Patent-assertion managers like General Patent Corporation International provide technical and financial support services to patent-assertion entities and help them evaluate the viability of their patent cases.<sup>121</sup> Behind the scenes, investment companies like Rembrandt IP and Altitude Capital provide the funds to acquire, license, and litigate patents.<sup>122</sup> Portfolio company Acacia counts among its largest investors household mutual fund managers like OppenheimerFunds, Fidelity, and the Vanguard Group,<sup>123</sup> and IV's funders include many practicing companies such as Microsoft, Intel, Sony, Apple, eBay, and Google.<sup>124</sup> In addition to contingent fee law firms like Niro Scavone, Fish & Richardson and Cooley Godward Kronish have been singled out for working with patent-assertion entities.<sup>125</sup>

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types of IP business models).

115. Ewing, *supra* note 102.

116. Daisy Ku, *UPDATE 1-UK's ICAP Buys Patent Broker Tomo for \$10 Mln*, REUTERS (June 16, 2009), <http://www.reuters.com/article/idUSLGG50594520090616>.

117. See Jamie Ludowitz, *PLX Announces Plans to Revolutionize \$3.5 Billion Patent Industry Through Global, Internet-Based Patent Auction Market*, EUREKALERT! (Jan. 22, 1999), [http://www.eurekaalert.org/pub\\_releases/1999-01/FI-PAPT-220199.php#](http://www.eurekaalert.org/pub_releases/1999-01/FI-PAPT-220199.php#); see also Hans Ibold, *Intellectual Property Auction Site Draws Heavy Action*, L.A. BUS. J., Dec. 4, 2000, at 16, 16.

118. See Glenn Wheeler, *What's Your Strategy at the IP Auction*, TAEUS INT'L CORP., <http://www.taeus.com/article.php?id=72> (last visited Dec. 17, 2010).

119. See, e.g., Ewing, *supra* note 102, at 67 (approximating IV's acquisition expenditures through public auction to be 5% of its total acquisition expenditures).

120. Millien & Laurie, *supra* note 114, at 55.

121. Matthew Fawcett & Jeremiah Chan, *March of the Trolls: Footsteps Getting Louder*, 13 INTELL. PROP. L. BULL. 1, 10 (2008).

122. See Mike Masnick, *Patent Holder Sues McAfee, Gets \$25 Million... But May End Up Losing \$5 Million Due to Everyone It Has To Pay Off*, TECHDIRT (Nov. 4, 2009, 12:51 PM), <http://www.techdirt.com/blog.php?company=altitude+capital+partners&edition=>; Nathan Vardi, *Patent Payday*, FORBES.COM (Feb. 12, 2008, 6:00 AM), [http://www.forbes.com/2008/02/11/patents-legal-rembrandt-biz-cz\\_nv\\_0212patent.html](http://www.forbes.com/2008/02/11/patents-legal-rembrandt-biz-cz_nv_0212patent.html).

123. *Shareholders Major ACTG Acacia Research Corporation Shareholders*, MORNINGSTAR, <http://investors.morningstar.com/ownership/shareholdersmajor.html?t=ACTG&region=USA&culture=en-US+%28%29> (click tab for "Institutions" to see Oppenheimer Funds) (last visited Dec. 17, 2010).

124. Nicholas Varchaver, *Who's Afraid of Nathan Myhrvold?*, FORTUNE, July 10, 2006, at 110, 112.

125. Fawcett & Chan, *supra* note 121, at 9; see also Zusha Elinson, *Intellectual Venture Takes Indirect Route to Court*, RECORDER (Sept. 1, 2009), <http://www.law.com/jsp/law/LawArticleFriendly.jsp?id=1202433490140> ("The widely used insult 'patent troll' was coined to describe Niro and his clients by Peter Detkin, then an Intel Corp. lawyer. Detkin is now co-founder and vice chairman of Intellectual Ventures.").

These and other intermediaries are needed to navigate what has been characterized as a thin or “blind” market in which buyers and sellers often miss each other.<sup>126</sup> In the recent past, the market has been heavily dependent on the behavior of a single market-maker, IV. As between buyers and sellers in general, there appears to be greater supply than demand for patents,<sup>127</sup> which insiders predict may cause a “flight to quality.”<sup>128</sup> At this point, it is unclear whether the vision of a robust, liquid “invention capital market” promoted by some<sup>129</sup> will actually be realized.

### C. DIFFERENCES BETWEEN “ARMS RACE” AND “MARKETPLACE” PARADIGMS

Although the arms race and marketplace paradigms coexist in today’s complex patent ecosystem, they differ significantly in some ways. While the arms race requires symmetry between competitors in order to keep litigation at bay, the marketplace facilitates the exploitation of asymmetries between actors. Defensive patents are the product of portfolio patenting, while “marketplace” portfolios are the product of patent purchasing. In the patent arms race, a defensive patent portfolio sends a signal to the public: Do not sue, or you might be sued. The marketplace, in contrast, allows companies to operate in secrecy. Companies participate in the patent arms race in order to gain freedom to operate, while the patent marketplace supports companies who leverage their freedom to litigate. Each of these contrasts is explored in greater detail below.

#### I. *Symmetric v. Asymmetric Stakes*

In the patent arms race, the symmetry of exposure and stakes between market actors is crucial to maintaining a patent stalemate. A pile of patents on each side means that each company has a potential weapon against the other; likewise, the product revenues on both sides mean that each is vulnerable to suit by the other. In the marketplace, the inverse is true—the wide diversity of business models means that

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126. Mark A. Lemley & Nathan Myhrvold, *How to Make a Patent Market*, 36 HOFSTRA L. REV. 257, 257–58 (2007).

127. One example of this imbalance was Ocean Tomo’s failed spring 2009 auction, in which only six out of eighty patent lots sold. Joe Mullin, *Bummer Before the Summer: OceanTomo Auction a Bust*, THE PRIOR ART (Mar. 30, 2009, 6:22 AM), [http://thepriorart.typepad.com/the\\_prior\\_art/2009/03/ocean-tomo-2009-spring-auction-results.html](http://thepriorart.typepad.com/the_prior_art/2009/03/ocean-tomo-2009-spring-auction-results.html).

128. Zaretski, *supra* note 78, at 66.

129. See generally Myhrvold, *supra* note 3 (describing his vision of an invention capital market that would provide funding and strong patents for inventors, among other roles); Joe Mullin, *Patent Enforcement Companies Speak at SF Conference*, THE PRIOR ART (May 28, 2010, 12:16 PM), [http://thepriorart.typepad.com/the\\_prior\\_art/2010/05/patent-enforcement-companies-speak-at-sf-conference.html](http://thepriorart.typepad.com/the_prior_art/2010/05/patent-enforcement-companies-speak-at-sf-conference.html) (describing Erich Spangenberg’s projection that the patent market will become more liquid and transactional).

companies can exploit asymmetries to their advantage. Companies that do not make products target the revenues of those that do. Such patentees are not burdened by the need to manage investor expectations or minimize disruption to the company's core business.<sup>130</sup> Some practicing companies have also taken advantage of asymmetric exposure between themselves and their targets by suing companies that work in areas that they do not, making them invulnerable to countersuit. This phenomenon is documented and explored in greater depth in Part II.A.

## 2. *Portfolio Patenting v. Patent Purchasing*

"Arms race" and "marketplace" approaches to patenting also differ. In pursuit of the patent arms race, companies generally file for patents on a wide range of inventions. In contrast, portfolios built on purchases from the marketplace tend to be smaller and more focused. With the exception of large portfolio companies like IV and Acacia, many of the patent-assertion entities associated with the patent marketplace have relatively small patent portfolios.<sup>131</sup> For example, the website of Paice, LLC, a Bonita Springs, Florida-based company that has sued Toyota and Ford over hybrid technology,<sup>132</sup> boasts just eleven U.S. patents.<sup>133</sup> Similarly, just five patents were asserted by NTP, Inc., a patent-assertion entity, in a suit against Research In Motion Limited ("RIM") that led to a \$612 million settlement.<sup>134</sup> For a patent-assertion entity, the limiting factor is often not the number of patents but the organizational resources required to assert the patents.

A practicing company's defensive patent portfolio, in contrast, needs to be larger in order to cover the wide range of technologies that may be relevant in the future. A typical cross-licensing deal between two large companies might involve rights to all patents in the companies' portfolios, numbering in the thousands.<sup>135</sup>

While small in size, the portfolios of companies like Paice tend to have a higher proportion of "crown jewels." For example, of the eleven patents listed as being in the Paice portfolio, four have been recognized as among the top nine "most dominant" patents in the hybrid technology field, based on an analysis of patent trends and citations performed by an independent source.<sup>136</sup> Likewise, in a larger study of 565 "troll" patents,

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130. Chien, *supra* note 5, at 1579.

131. See, e.g., McCurdy, *supra* note 17, at 80 ("[P]atent enforcement entities . . . are highly selective in their purchases. They have relatively small and focused patent portfolios.").

132. *Paice's Patents: Paice and Toyota*, PAICE, <http://www.paice.net/paices-patents/paice-v-toyota> (last visited Dec. 17, 2010).

133. *Paice's Patents: List of U.S. Patents*, PAICE, <http://www.paice.net/paices-patents/list-of-u-s-patents> (last visited Dec. 17, 2010).

134. *NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282, 1287 (Fed. Cir. 2005).

135. RICHARD RAYSMAN ET AL., *INTELLECTUAL PROPERTY LICENSING: FORMS AND ANALYSIS* § 6.02A (2010).

136. MIKE LLOYD & JUSTIN BLOWS, *WHO HOLDS THE POWER? LESSONS FROM HYBRID CAR*

Fisher and Henkel found the “troll” patents to be significantly higher quality than others,<sup>137</sup> contrary to reports that patent-assertion entity patents are generally weak and of low quality.<sup>138</sup>

### 3. *Patent Signals v. Patent Secrecy*

In the arms race, patents are used to send signals to the public. The primary message that a large patent portfolio sends to competitors is: If sued, I have the ability to retaliate. Patenting activity also conveys to the world that the patentee is innovative and a technology leader.<sup>139</sup> IBM, for example, communicates both of these messages year after year, by publicizing its status as a top patentee.<sup>140</sup>

In contrast, the marketplace allows companies to exploit secrecy to their advantage. Many patent-assertion entities, for example, lack websites that describe what they do.<sup>141</sup> IV, Acacia, and others have assigned their patents to thousands of shell companies and subsidiaries, making it hard to track what they do.<sup>142</sup> This secrecy serves a “troll” business model, in which patentees wait until companies are already practicing an invention to “surprise” them with a suit.<sup>143</sup> For these reasons, patent-assertion entities are more likely to “speak softly and wield a big stick,” as it were, than to publicize their holdings. Practicing companies also have been known to hide information about patent transactions, for example, in order to avoid public scrutiny.<sup>144</sup>

A lack of transparency in the marketplace serves sellers as well as buyers. The anonymity of the marketplace allows companies to transact

INNOVATION FOR CLEAN TECHNOLOGIES 10 tbl.2 (2009).

137. Timo Fischer & Joachim Henkel, *Patent Trolls on Markets for Technology—An Empirical Analysis of Trolls’ Patent Acquisitions* 18 (Dec. 2009) (working paper), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1523102](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1523102).

138. Mallun Yen, *Panel on Developing Business Models: View from the Industry* 3 (Dec 5, 2008) (prepared statement submitted to the FTC), available at <http://www.ftc.gov/bc/workshops/ipmarketplace/dec5/docs/myen2.pdf> (“[M]ore often, the assertions we receive present patents of dubious validity and weak arguments of infringement . . .”).

139. Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 651–53 (2002).

140. See *supra* note 35 and accompanying text; see also, e.g., Robert Jaques, *IBM Sets Record for Most Patents Lodged in a Year*, AUSTRALIAN PC AUTH. (Jan. 12, 2007), <http://www.pcauthority.com.au/News/71117.ibm-sets-record-for-most-patents-lodged-in-a-year.aspx>.

141. Described generally in Chien, *supra* note 5.

142. See, e.g., Press Release, Acacia Research Corp., *Acacia Research Reports First Quarter 2009 Financial Results* (Apr. 23, 2009), <http://acaciatechnologies.com/pr/0423091stqtrfinancials.pdf> (describing Acacia’s more than 100 patent portfolios, held collectively by its many subsidiaries); Avancept, *supra* note 87, at 18 (estimating that IV has up to 1100 shell companies); see also Mullin, *supra* note 129 (“[Erich Spangenberg has a] very large network of patent-holding companies, several of which are named after Greek gods.”).

143. See Chien, *supra* note 5, at 1579 n.34.

144. Ewing, *supra* note 102, at 69 (“CFOs nervously roll IP licensing expenses into the costs of goods produced to avoid any public slip. Miniature versions of actual sales documents are publicly recorded to thwart greater disclosure. Creating a limited liability company to hold IP assets provides still greater uncertainty.”).

with partners with whom they may not want to be publicly associated. However, the opacity of the market creates information asymmetries and opportunities for arbitrage. Intermediaries such as the Patent Troll Tracker, which sought to expose patent trolls as they sued,<sup>145</sup> Avancept, which uses a variety of methods to research and develop reports about IV,<sup>146</sup> and PatentFreedom, which amasses and distributes information about patent-assertion entities to its customers,<sup>147</sup> have arisen to provide data about the market not otherwise readily available.

#### 4. *Freedom to Operate v. Freedom to Litigate*

While defensive patent portfolios are acquired in order to secure freedom to operate, the marketplace has allowed companies that do not develop technology or products to exploit their freedom to litigate. Patent-assertion entities that do not have competing demands on their time and are invulnerable to countersuit have some advantages in patent litigation over practicing companies. These characteristics enable patent-assertion entities to more credibly threaten to exercise the right to exclude conferred by a patent.

## II. THE COMPLEX PATENT ECOSYSTEM

Together, the patent arms race and patent marketplace form the basis of the “complex patent ecosystem.” While the “superpowers” of the patent arms race and patent-assertion entities of the patent marketplace represent two of the most visible players within the patent environment, today’s ecosystem features many kinds of entities, each with its own distinct business model, patent profile, and patent strategy. This Part describes the various practicing and non-practicing company types within the patent ecosystem, and the relationships between them. It describes how, although often cast as opposites, “arms race” (defensive) and “marketplace” (offensive) patent strategies are in fact closely related.

### A. PRACTICING COMPANIES

Companies that practice their inventions use patents in a variety of ways in the current patent ecosystem. Practicing companies that adopt a defensive stance obtain patents primarily to protect their product revenue,<sup>148</sup> while companies that strategically or offensively assert their

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145. Chien, *supra* note 5, at 1581.

146. Avancept, *supra* note 87, at 18.

147. *About Us*, PATENTFREEDOM, <http://www.patentfreedom.com/aboutus.html> (last visited Dec. 17, 2010).

148. See Apple, Inc., Annual Report (Form 10-K) 56, 62 (Oct. 27, 2009). Apple’s income statement shows “sales” as the single category of income, which in turn is comprised of “revenue from the sale of hardware, software, digital content and applications, peripherals, and service and support contracts.”



patents use them to generate patent-related revenue.<sup>149</sup> According to a common progression, patents acquired defensively to protect product revenues are turned into assets to generate patent revenues.

### *I. Defensive Patenting Strategy*

Among modern high-tech companies that practice defensive patenting, Cisco is a good example.<sup>150</sup> It generates its revenue from sales of its products<sup>151</sup> and uses its patents “to defend its freedom to innovate.”<sup>152</sup> This defensive strategy has consisted of obtaining a large portfolio of patents for cross-licensing in order to avoid licensing fees and to prevent competitors from blocking its products.<sup>153</sup> Historically, Cisco did not charge royalties for use of its patents but had a policy of “sharing them as freely as possible,” in order to encourage interoperability with its networking products.<sup>154</sup>

Sun Microsystems, which similarly uses its patents defensively, uses its “patent portfolio to protect communities[] and indemnify customers.”<sup>155</sup> It embraces the open source movement, and has “freed more than 1,600 [of its] patents” to support open-source development.<sup>156</sup> The company’s approach has been to share, rather than to hold its patents. Sun’s decision to offer JavaScript for free, for example, has been described as a “mapping” strategy, in which a company finds an area of technology that is relatively free of existing rights and does not enforce its own proprietary rights, in order to create a standard in a new technology field.<sup>157</sup> This control of the market can then be leveraged to make money by selling services (including advertising), licenses, or hardware.<sup>158</sup>

In defensive contexts, patents are used to ward off suits, as well as to gain access to technology and to further technological adoption. By

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*Id.* at 62.

149. Dan McCurdy, *Out of Alignment-Getting IP and Business Strategies Back in Sync*, in *FROM ASSETS TO PROFITS: COMPETING FOR IP VALUE AND RETURN 6* (Bruce Berman ed., 2009).

150. *Id.*

151. Cisco Systems, Inc., Annual Report (Form 10-k) (Sept. 10, 2009) (reporting that product sales generated 81% of Cisco’s income, specifically \$29K million out of \$36K million total).

152. Press Release, Stacy Williams, Cisco Patent Program Becomes Cornerstone of Continued Innovation (July 8, 2003), [http://newsroom.cisco.com/dlls/ts\\_070803.html](http://newsroom.cisco.com/dlls/ts_070803.html) (quoting Robert Barr, Vice President for IP and Worldwide Patent Counsel, Cisco Systems, Inc.) (internal quotation marks omitted).

153. *Id.*

154. *Id.* (quoting Robert Barr, Vice President for IP and Worldwide Patent Counsel, Cisco Systems, Inc.) (internal quotation marks omitted).

155. Jonathan Schwartz, *Thank You, Network Appliance*, JONATHAN SCHWARTZ’S BLOG (Sep. 6, 2007, 5:00 AM), [http://blogs.sun.com/jonathan/entry/on\\_patent\\_trolling](http://blogs.sun.com/jonathan/entry/on_patent_trolling).

156. *Patents Smart Assets*, *supra* note 1, at 60.

157. NERMEN AL-ALI, *COMPREHENSIVE INTELLECTUAL CAPITAL MANAGEMENT: STEP-BY-STEP 147* (2003).

158. *Id.*

joining patent pools and entering into related cross-licenses, a company can simultaneously gain rights to the technology of others and encourage use of its own inventions.<sup>159</sup>

While companies that use patents for defensive purposes usually do not initiate lawsuits, their product revenues make them attractive litigation targets. Samsung and Apple, for example, which have been viewed as mostly defensive in their use of patents,<sup>160</sup> are among the companies “most pursued” by patent-assertion entities.<sup>161</sup> With arguably the most to lose and the least to gain from patent litigation, defensive patent companies have strong incentives to buy patents defensively<sup>162</sup> and to lobby Congress for patent reform.<sup>163</sup>

## 2. *Offensive Patent Strategy*

In contrast to a primarily defensive strategy, in which patents are used to protect and grow product revenues, in an offensive patent strategy, companies use their patents to obtain IP revenues.<sup>164</sup> At times, these patents are in areas in which the company no longer operates or never did. For example, a company may, when exiting a technology area, seek to license the technology in order to recoup past R&D expenses.<sup>165</sup> Or the company might have patented the technology at an early stage and never developed it. As to such patents, the patent owner is “non-practicing.”<sup>166</sup> When they assert such patents, companies have been accused of being corporate “trolls.”<sup>167</sup>

General Electric (“GE”) is a good example. Although the company did not engage in much licensing historically,<sup>168</sup> in recent years, it has

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159. See generally Josh Lerner et al., *Cooperative Marketing Agreements Between Competitors: Evidence from Patent Pools* (Nat'l Bureau of Econ. Research, Working Paper No. 9680).

160. But see Nick Bilton, *What Apple vs. HTC Could Mean*, Posting to *Bits*, N.Y. TIMES (Mar. 2, 2010, 7:00 PM), <http://bits.blogs.nytimes.com/2010/03/02/what-apple-vs-htc-could-mean/> (describing a suit initiated by Apple against HTC, whose handsets use Google's Android technology).

161. *Ranking of Operating Companies by Number of NPE Lawsuits*, PATENTFREEDOM (Apr. 1, 2010), <https://www.patentfreedom.com/research.html>.

162. Rachael King, *Tech Giants' New Way To Thwart Patent Suits*, BUS. WK. (Feb. 1, 2010, 11:41 PM EST), [http://www.businessweek.com/technology/content/feb2010/tc2010021\\_382392.htm](http://www.businessweek.com/technology/content/feb2010/tc2010021_382392.htm) (describing Cisco and Samsung as members of defensive buying company RPX).

163. See *Patent Reform*, Cisco, [http://www.cisco.com/web/about/gov/markets/patent\\_reform.html](http://www.cisco.com/web/about/gov/markets/patent_reform.html) (last visited Dec. 17, 2010).

164. The term “IP revenue” refers to patent-related income generated by licensing, patent sales, and related uses of IP.

165. BERNICE LEE ET AL., CHATHAM HOUSE, WHO OWNS OUR LOW CARBON FUTURE? INTELLECTUAL PROPERTY AND ENERGY TECHNOLOGIES 6 (2009), (describing such a practice as “divestiture licensing”).

166. See Chien, *supra* note 5, at 1577–78.

167. See, e.g., Joseph N. Hosteny, *Litigators Corner: Is IBM a Patent Troll?*, INTELL. PROP. TODAY, May 2006, at 26, 26–27.

168. Wayne Reinke, *Patents Should Be the Starting Point for a Solid Licensing Strategy*, MASS HIGH TECH (Mar. 6, 2006), <http://www.masshightech.com/stories/2006/03/06/focus4-Patents-should-be-the-starting-point-for-a-solid-licensing-strategy.html> (“GE has historically limited the licensing of its patent portfolio. However, according to Jim Aloise, director of global licensing development at GE

developed a business around patent enforcement through its “Trading and Licensing” or “CIF Licensing” division.<sup>169</sup> In 2008, licensing revenues accounted for \$291 million, reflecting an annual revenue growth of 15% from the previous year.<sup>170</sup> GE’s strategy has been to focus on licensing non-core technologies in areas in which it is not currently practicing, like consumer electronics.<sup>171</sup> Recently, CIF Licensing sued Agere Systems<sup>172</sup> and Lenovo<sup>173</sup> over modem and MPEG-2 technology, areas outside of GE’s core business.<sup>174</sup>

Other companies that make significant revenue from their patent portfolios include IBM, Lucent, TI, Kodak, Thompson, and Philips.<sup>175</sup> However, each follows its own unique approach. IBM, for example, uses its portfolio to access technology, as well as patent royalties;<sup>176</sup> historically, it has not resorted to litigation.<sup>177</sup> Lucent has a large IP group that licenses technology to third parties before or after the technology has been commercialized.<sup>178</sup> Patent licensing can be highly profitable, given its low marginal costs.

Many practicing companies simultaneously use defensive and offensive patent strategies. In a number of settings, the defensive accumulation of patents has set in motion a progression that has resulted in their strategic licensing and enforcement. Take the example of Harris

Licensing, GE has stepped up its efforts in licensing its technology over the past few years.”).

169. See Ellen Mann, *CIF Brings Innovative Thinking and Resources to Their Customers*, FINANCING ANSWER, July 2005, available at <http://www.cefcorp.com/commequip/toolsandresources/fajuly2005.pdf> (describing the formation of Intellectual Property Group and explaining that it permits “customers to take advantage of intangible assets such as patents, trademarks and other intellectual property that might otherwise lie dormant, or expire without proper commercialization” and describing one such campaign undertaken for Motorola); see also Phil Milford, *GE Licensing Wins 7.6 Million Patent Award from LSI*, BLOOMBERG (Feb. 17, 2009, 21:47 EST), <http://www.bloomberg.com/apps/news?pid=conewsstory&refer=conews&tkr=MOT:US&sid=a48zmrkP.LxI> (describing successful patent infringement suit brought by GE licensing unit, “CIF Licensing”).

170. General Electric Co., Annual Report (Form 10-K) 85 (Feb. 19, 2009).

171. See Reinke, *supra* note 168.

172. Milford, *supra* note 169.

173. Complaint, *CIF Licensing, L.L.C. v. Lenovo Grp. Ltd.*, No. 09 CV 1849 (S.D.N.Y., Feb. 27, 2009).

174. *General Electric Company Profile*, HOOVERS, [http://www.hoovers.com/company/General\\_Electric\\_Company/rfjyci-1.html](http://www.hoovers.com/company/General_Electric_Company/rfjyci-1.html) (last visited Dec. 17, 2010) (noting that GE’s core business is broad, including aircraft engines, medical imaging equipment and kitchen and laundry appliances, but does not encompass modem and MPEG technologies).

175. McCurdy, *supra* note 149, at 7.

176. *Id.* at 9–10. For one view that it is, see Hosteny, *supra* note 167, at 27.

177. PHELPS & KLINE, *supra* note 35, at xi, 27 (stating that while Marshall Phelps ran IBM’s IP organization from 1971–2000, he “never sued anybody”).

178. Stuart Macdonald, *When Means Become Ends: Considering the Impact of Patent Strategy on Innovation*, 16 INFO. ECON. & POL’Y 135, 141 (2004) (“Lucent Technologies . . . has an intellectual property business group with 266 employees to make a profit from . . . companies that come to [it] . . .” (quoting David Rubenstein, *Patent Profits*, INDUSTRY WK. (Nov. 2, 1998), [http://www.industryweek.com/articles/patent\\_profits\\_102.aspx](http://www.industryweek.com/articles/patent_profits_102.aspx))).

Corporation, a public information technology company that sells hardware and software products.<sup>179</sup> As its Vice President of Intellectual Property, Leslie Hart, testified in 2002, the company started out by having “no patents and . . . and building infringing product.”<sup>180</sup> Once the company started generating revenues, it became the subject of demands for royalties from companies like AT&T and Bell Laboratories.<sup>181</sup> Harris built up its defensive portfolio to defend itself against future demands.<sup>182</sup> At some point, the company had a critical mass of patents that could be used not only defensively but to generate royalties.<sup>183</sup>

In another example, American Express developed a defensive program in direct response to business patent lawsuits that were brought after the *State Street* decision in 1998.<sup>184</sup> As the company began to protect its IP “just defensively,” it began to realize value from its portfolio.<sup>185</sup> These activities proved so lucrative that patent enforcement grew into a full line of business within the corporation, with its own bottom line profit and loss statement and financial targets.<sup>186</sup> The Xerox Corporation’s formation of the Xerox IP Operations business line in 1998 was similarly motivated by a desire to develop an active patent licensing program based on a large arsenal of patent assets.<sup>187</sup> In a similar vein, Lucent’s licensing business line is tasked with making profits from licensing patents and with providing a good return on the company’s investments in R&D.<sup>188</sup>

Some practicing companies have formed ventures to enforce their patents. Sisvel, for example, is a company that licenses the patents of the consumer electronics company Philips, among others.<sup>189</sup> The company US Ethernet Innovations, located in Tyler, Texas, was formed in order to assert the patents of the 3Com Corporation,<sup>190</sup> which makes networking

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179. HARRIS CORP., <http://www.harris.com> (last visited Dec. 17, 2010).

180. *Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy: Joint Hearings Before the Fed. Trade Comm’n & Dep’t of Justice* 42 (Apr. 9, 2002) [hereinafter *Competition FTC Hearing V*] (statement of Leslie Hart, Vice President of IP, Harris Corp.), available at <http://www.ftc.gov/opp/intellect/020409ftctrans.pdf>.

181. *Id.* at 41.

182. *Id.* at 42.

183. *Id.*

184. *Evolving Marketplace II*, *supra* note 76, at 38 (statement of Tracey R. Thomas, Chief IP Strategist and License Negotiator, American Express Co.). For the decision, see *State St. Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1369 (Fed. Cir. 1998).

185. *Evolving Marketplace II*, *supra* note 76, at 38 (statement of Tracey R. Thomas, Chief IP Strategist and License Negotiator, American Express Co.).

186. *Id.*

187. RIVETTE & KLINE, *supra* note 15, at 59–60.

188. *Id.* at 125.

189. *About Us: History*, SISVEL, <http://www.sisvel.com/english/aboutus/history> (last visited Dec. 17, 2010).

190. U.S. ETHERNET INNOVATIONS, <http://www.usethernetinnovations.com> (last visited Dec. 17, 2010).

equipment.<sup>191</sup> It sued twenty-three companies in 2009 and 2010, including Hewlett Packard (HP), Sony, and Toshiba, and was later acquired by HP.<sup>192</sup>

FIGURE 1: EXEMPLARY STAGES IN A COMPANY'S PATENT STRATEGY

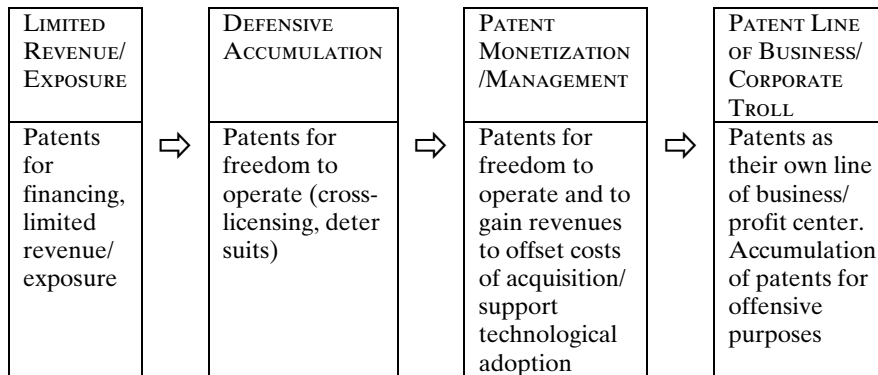


Figure 1 represents several possible stages in a company's patent strategy, from startup to defensive accumulation to offensive assertion. Though few companies have traversed the complete pathway, the experiences of American Express and Harris demonstrate the lure of doing so. Patent portfolio building is expensive, and patent enforcement provides one way to subsidize it. Companies that do not have the time, culture, or wherewithal to enforce their own patents can, at least in theory, sell their patents to someone who will. The proceeds from patent enforcement can be used, in turn, to reward inventors and underwrite company operations.<sup>193</sup> It could be argued that patent enforcement programs, by providing a return on R&D expenses,<sup>194</sup> can underwrite and therefore encourage socially desirable innovation.<sup>195</sup>

191. *Corporate Information: 3Com @ a Glance*, 3COM, [http://www.3com.com/corpinfo/en\\_US/index.html](http://www.3com.com/corpinfo/en_US/index.html) (last visited Dec. 17, 2010).

192. U.S. ETHERNET INNOVATIONS, *supra* note 190.

193. *Evolving Marketplace II*, *supra* note 76, at 43 (statement of Laura G. Quatela, Chief IP Officer & Vice President, Eastman Kodak Co.) ("We've begun to sell patents with a targeted program and a staff to support it recently for two reasons. First is to fund the transformation that the company is experiencing from an analog manufacturing space to a digital space, which is a highly expensive transformation, and the second reason is to give our inventors some sense of accomplishment if their inventions are not commercialized. There is a very real tangible satisfaction rate that goes along with picking patents that the company won't practice and putting them out on the market and realizing the return for the shareholder.").

194. See, e.g., Lawrence J. Bassuk, *Patents, Standards, and Licensing: Working (Well) Together at Texas Instruments 2* (Jan. 29, 2010) (article presented at AIPLA's 33rd Mid-Winter Institute Program: IP Licensing), available at [http://www.aipla.org/html/mw/2010/papers/Bassuk\\_Paper.pdf](http://www.aipla.org/html/mw/2010/papers/Bassuk_Paper.pdf) ("TI gets and uses patents under three guiding principles, [including] . . . earning a return on our investment in research

However, making the transition from defensive accumulation to patent monetization is neither easy nor automatic. The patents that a company is willing to license may not have commercial value. Even if the patents are being practiced, a company may have neither the means nor the inclination to pursue infringers or possible technology partners. As described earlier, the patent market currently includes too many patents for too few buyers.<sup>196</sup> Unless the leadership within a company views patents as a strategic asset,<sup>197</sup> it is more likely than not that the company will stay in a “defensive” mode.

Only time will tell whether the companies currently perceived to be practicing defensive patent strategies will shift their models over time. Sun, for instance, has offered a number of its patents for sale through public auction,<sup>198</sup> suggesting that their defensive patents may not always remain so. The paragraphs above describe the diversity of practicing company models, from defensive, to offensive, to hybrid models in between.

#### B. NON-PRACTICING ENTITIES

Entities that do not practice their patents operate along a wide spectrum of business models. Mark Lemley and Nathan Myhrvold have developed a taxonomy of twelve types of patent holders, eleven of which are non-practicing.<sup>199</sup> One industry veteran divides non-practicing entities into three main categories: entities that litigate, entities that license, and individual inventors.<sup>200</sup> Some non-practicing entities are considered “trolls,” while others arguably should not be.<sup>201</sup>

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and development.”).

195. However, they also come at a cost to society, through the disincentives provided to the commercializing infringer, who may in fact have independently invented the technology. If litigated inventions are representative of all patented inventions, then most infringers are likely to be independent inventors. See Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law 2* (Stanford Pub. Law, Working Paper No. 1270160, 2009), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1270160](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1270160) (“A surprisingly small percentage of patent cases involve even allegations of copying, much less proof of copying.”).

196. See *supra* Part I.B.2.

197. See, e.g., PHELPS & KLINE, *supra* note 35, at 138 (“The average grade for the executive management of patents today is probably a D-minus. Most patents are not managed at all; they just sit there.” (quoting Nathan Myhrvold)); Sharon Oriel, *Hooking the Corporation on the Value of Intellectual Assets*, INTELL. ASSET MGMT., Sept./Oct. 2010, at 91, 91 (finding most companies are focused on creating and obtaining patents, but do not realize the significant income they are missing by ineffectively managing their portfolio).

198. See *infra* notes 342–46 and accompanying text.

199. See, e.g., John R. Allison et al., *Extreme Value or Trolls on Top? The Characteristics of the Most Litigated Patents*, 158 U. PA. L. REV. 1, 10 tbl.1 & n.20 (2009) (showing twelve entity-status classes).

200. McCurdy, *supra* note 17, at 80–81 (describing various actors in the “Patent Troll Realm”).

201. Mark A. Lemley, *Are Universities Trolls?* 18 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 611, 612 (2008).

The difficulty with determining what to call entities that do not practice their patents is the wide diversity of what they actually do. Although most entities use patents in a variety of ways, below I place various non-practicing entities into categories based on how they primarily use patents. Research and development entities, for example, use patent license fees to fund technology development; patent-assertion entities, in contrast, primarily use patents to get and distribute licensing fees, rather than to support the development or transfer of technology; defensive patent trusts acquire patents so that they will not be used to sue their licensees; and startups acquire patents primarily in order to deter copying and attract financing. As a company's business model evolves over time, the company may move from one category to another.

### *I. Research and Development Entities*

A research and development entity is a non-practicing patentee that develops its own technology. This category includes universities, who patent the inventions developed in their labs and on their campuses in order to earn licensing revenues and to facilitate technology transfer.<sup>202</sup> Universities generally license rather than assign their technology but also at times enforce their patents in the courtroom.<sup>203</sup> The category of R&D entity includes companies like Tessera, Rambus, and Qualcomm, that, like universities, also manage large research budgets, but in a corporate setting. These companies supply upstream technology to manufacturers, rather than make it themselves.<sup>204</sup>

While R&D entities have been accused of being trolls, their primary activity is the development of new technologies, which they support through technology licensing.<sup>205</sup> The standard paradigm of university technology transfer is to license patents *ex ante*, as part of the larger technology transfer mandate of the university,<sup>206</sup> rather than to wait until a company has independently developed and commercialized an infringing product.<sup>207</sup> Three-quarters of Tessera's employees are engaged

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202. Jerry G. Thursby et al., *Objective, Characteristics and Outcomes of University Licensing: A Survey of Major U.S. Universities*, 26 J. TECH. TRANSFER 59, 65 (2001) ("The most important objective to the [technology transfer office] is clearly royalties and fees generated . . .").

203. See, e.g., Arti K. Rai et al., *University Software Ownership and Litigation: A First Examination*, 87 N.C. L. REV. 1519, 1525 (2009).

204. Letter from Teresa Stanek Rea, President, Am. Intellectual Prop. Law. Ass'n, to Suzanne Michel, Assistant Dir., Fed. Trade Comm'n (May 15, 2009), available at <http://www.ftc.gov/os/comments/iphearings/540872-00045.pdf> ("[T]echnology development companies . . . Qualcomm, Rambus, AmberWave, MOSAID, and Tessera . . . engage in research and development, but do not directly manufacture products.").

205. Though they certainly have been accused of launching surprise attacks, too. See, e.g., ORG. FOR ECON. CO-OPERATION & DEV., *supra* note 64, at 35, 37 (describing alleged "patent ambushes" by Rambus and Qualcomm).

206. See Thursby et al., *supra* note 202, at 70 ("Most inventions which evolve from university research are disclosed at a very early stage of development . . .").

207. ASS'N FOR UNIV. TECH. MANAGERS, IN THE PUBLIC INTEREST: NINE POINTS TO CONSIDER IN

in R&D, and the company maintains a facility for and earns revenue from manufacturing optic products and components.<sup>208</sup> Qualcomm also derives revenue from the sale of hardware which it manufactures by outsourcing to its many foundry partners.<sup>209</sup> Rambus does not sell products<sup>210</sup> but has a sizeable R&D budget and offers engineering services as part of the licenses it gives to the company's technology.<sup>211</sup> In these ways, these R&D entities are distinguishable from companies that focus primarily on patent assertion.

However, with their large patent portfolios, R&D entities are well poised to shift their emphasis to enforcement. Canadian company Wi-LAN, for example, decided in 2006 to change its focus from commercializing its technology to monetizing patents it has acquired from others, as well as those it has developed internally.<sup>212</sup> MOSAID is another example of a company that has transitioned away from research and towards patent assertion.<sup>213</sup> Although both companies still have R&D budgets, patent assertion has become their primary business.<sup>214</sup>

## 2. Patent-Assertion Entities

Patent-assertion entities are focused on the enforcement, rather than the active development or commercialization of their patents. Patent-assertion entities can be further divided into several types—large-portfolio companies, small-portfolio companies, and individuals.<sup>215</sup>

The largest of the patent-assertion portfolio companies are Acacia, IV, and John Desmarais's Round Rock Research LLC.<sup>216</sup> Acacia is a

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LICENSING UNIVERSITY TECHNOLOGY 6 (2007) [hereinafter PUBLIC INTEREST], [http://www.autm.net/Nine\\_Points\\_to\\_Consider.htm](http://www.autm.net/Nine_Points_to_Consider.htm) (“In considering enforcement of their intellectual property, it is important that universities be mindful of their primary mission to use patents to promote technology development for the benefit of society.”).

208. *Patent Reform in the 111th Congress: Legislation and Recent Court Decisions: Hearing Before the S. Comm. on the Judiciary*, 111th Cong. 240 (2009) (statement of Taraneh Maghame, Vice President, Tessera, Inc.).

209. QUALCOMM, THIRD QUARTER FISCAL 2010 EARNINGS (2010), available at <http://investor.qualcomm.com/common/download/download.cfm?companyid=QCOM&fileid=388424&filekey=fceadfdafbc-4a41-a755-e5cbd606eccc&filename=Q310EarningsWebFINAL.pdf>; Mark Lapedus, *Qualcomm's Foundry Push Closes Gap with TI*, EE TIMES (Sept. 8, 2006, 11:50 AM EDT), <http://www.eetimes.com/electronics-news/4064790/Qualcomm-s-foundry-push-closes-gap-with-TI>.

210. *Rambus Reports Second Quarter Earnings*, BUS. WIRE, July 22, 2010, <http://investor.rambus.com/releasedetail.cfm?ReleaseID=491256>.

211. *Licensing*, RAMBUS, <http://www.rambus.com/us/about/licensing/index.html> (last visited Dec. 17, 2010).

212. Wi-LAN, <http://www.wi-lan.com/company/default.aspx> (last visited Dec. 17, 2010).

213. James Bagnall, *Ottawa's Patent Power Outperforms*, OTTAWA CITIZEN, Aug. 27, 2010, <http://www.ottawacitizen.com/business/Ottawa+patent+powers+outperform/3448044/story.html>.

214. *Id.*

215. Brad Feld, *The Typical Kinds of Software Patent Plaintiffs*, FELDTHOUGHTS (Apr. 13, 2010), <http://www.feld.com/wp/archives/2010/04/the-typical-kinds-of-software-patent-plaintiffs.html> (describing several classes of software patentee litigants including the “small fry troll,” “fund troll,” and “big fish troll” (internal quotation marks omitted)).

216. The last of which is described *infra*, at note 318 and accompanying text.



publicly traded company that, through its subsidiaries, enforces the patents of individual inventors, small companies, and even large companies seeking to monetize their patents.<sup>217</sup> It generally splits the revenues it receives, giving half to the inventor and retaining half for itself,<sup>218</sup> in a kind of “outsourcing” model. Acacia both licenses and litigates as part of its enforcement campaigns. Through its subsidiaries, the company was involved in 308 lawsuits from its founding in 1993 to 2008<sup>219</sup> and has generated \$410 million in revenues.<sup>220</sup>

IV acquires, develops, and licenses patents for fees and equity investments, at times resorting to litigation.<sup>221</sup> It has purchased most of the patents in its 30,000-plus patent portfolio from all types of patentees—individual inventors, universities, nonprofits, big companies such as Enron, and failed startups.<sup>222</sup> This portfolio has generated over \$1 billion. For example, in 2008 IV obtained \$200–400 million from Cisco,<sup>223</sup> as well as \$100 million in licensing fees and an additional \$250 million in an equity investment from Verizon.<sup>224</sup> In 2009 it secured a \$120 million licensing deal with Intuit.<sup>225</sup> To fund its activities, IV’s investors have committed billions of dollars in capital. They include both traditional

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217. ACACIA TECHS., *supra* note 101, at 3 (“[P]atent owners who engage with us are primarily inventors and small companies who have limited resources to deal with unauthorized users, but include some large companies looking to turn their patents into revenue.”).

218. Letter from Paul Ryan, Chief Exec. Officer, Acacia Research, to Fed. Trade Comm’n (May 13, 2009), available at <http://www.ftc.gov/os/comments/iphearings/540872-00048.pdf>.

219. McCurdy, *supra* note 17, at 80.

220. ACACIA TECHS., LLC PATENT LICENSING & TECH., <http://acaciatechnologies.com/index.htm> (last visited Dec. 17, 2010).

221. Don Clark & Dionne Searcey, *Big Patent Firm Sues Nine Tech Firms*, WALL ST. J. (Dec. 9, 2010), <http://online.wsj.com/article/SB10001424052748703493504576007444122372926.html> (describing a suit brought by IV against technology companies). *But see* Myhrvold, *supra* note 3, at 46 (“While I don’t rule [litigation] out, I see it as a highly undesirable recourse for several reasons: It’s expensive, it’s unpredictable, and it takes years.”).

222. Victoria Slind-Flor, *IV Moves from Myth to Reality*, INTELL. ASSET MGMT., Aug/Sept. 2006, at 29, 32.

223. Amol Sharma & Don Clark, *Tech Guru Riles the Industry By Seeking Huge Patent Fees*, WALL ST. J., Sept. 17, 2008, at A1.

224. Verizon Communications Inc., Quarterly Report (Form 10-Q) 15 (June 30, 2008) (“During the second quarter of 2008, we entered into an agreement to acquire a non-exclusive license (the ‘IP License’) to a portfolio of intellectual property owned by an entity formed for the purpose of acquiring and licensing intellectual property. We paid an initial fee of \$100 million for the IP License, which is being amortized over the expected useful lives of the licensed intellectual property. In addition, we executed a subscription agreement (with a capital commitment of up to \$250 million to be funded as required through 2012) to become a member in a limited liability company (the ‘LLC’) formed by the same entity for the purpose of acquiring and licensing additional intellectual property. In connection with this investment, we will receive non-exclusive license rights to certain intellectual property acquired by the LLC for an annual license fee.”).

225. Intuit Inc., Quarterly Report (Form 10-Q) 24 (Apr. 30, 2009) (“On May 14, 2009, we entered into an agreement to license certain technology for total consideration of \$120 million payable over the next ten fiscal years.”); Zusha Elinson, *Intellectual Ventures and Intuit Work Out \$120 Million Licensing Deal*, *Say Sources*, RECORDER, June 24, 2009, <http://www.law.com/jsp/article.jsp?id=1202431711930>.

investors, such as pension funds, and Fortune 500 companies, whose relationships with IV may afford access to the technology in its portfolio.<sup>226</sup> As such, IV embodies a “value added” model of patent holding—by aggregating rights in various technology areas, it can provide companies with greater freedom to operate through its patent licenses.<sup>227</sup> When it does, IV arguably functions like a defensive patent fund.<sup>228</sup> In addition to litigating, IV has sold patents to companies that have used its patents to do so.<sup>229</sup>

Many patent-assertion entities have fewer patents. For example, Texas company Stragent LLC, which has targeted wireless companies,<sup>230</sup> Google,<sup>231</sup> and Audi,<sup>232</sup> is listed as the assignee on at least sixty U.S. patents or patent applications.<sup>233</sup> Las Vegas-based Synchrome Technologies has sued Samsung, Panasonic and other electronics device makers based on a portfolio of fewer than ten patents.<sup>234</sup> Patent-assertion entities have bought such portfolios in public auctions and then used them to sue others.<sup>235</sup>

A number of independent inventors have turned their focus away from the active development or practice of their patents and have moved towards patent enforcement. At that point, they have become patent-assertion entities. Independent inventors are among the most litigious actors in the patent system. According to one study, a single individual, Ron Katz, is an inventor on twenty of the top hundred most litigated

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226. Myhrvold, *supra* note 3, at 44. Its investors include Microsoft, Apple, Google, and eBay. See *supra* note 124 and accompanying text.

227. PUBLIC INTEREST, *supra* note 207.

228. To the extent it sells portfolios of patents to support the development of technology, IV, through some transactions, may also more closely resemble an R&D entity than a patent-assertion entity.

229. See, e.g., Elinson, *supra* note 125 (describing litigation by Picture Frame Innovations, LLC of patent acquired from an IV shell company).

230. Complaint at 1, Stragent, LLC v. Nokia Inc., No. 2:08-cv-293 (E.D. Tex. July 29, 2008) (listing among others Nokia, Motorola, Palm, RIM, Sony Ericsson, AOL, Google, Microsoft, etc.).

231. *Id.*

232. *Stragent Targets Slew of Tech, Car Cos. in IP Suits*, LAW 360 (Apr. 30, 2010), <http://www.law360.com/articles/165367> (on file with the Hastings Law Journal).

233. Based on a review of the assignment record, using the following link, sixty-five patents were found. Stragent, LLC and Stragent Technologies, LLC are presumed to be the same entity as they share identical address information. *Assignments on the Web*, U.S. PATENT & TRADEMARK OFFICE, <http://assignments.uspto.gov/assignments/?db=pat> (use search term “stragent” in searchbox “Assignee Name”).

234. Steve Kanigher, *Little Las Vegas Patent Firm Takes on Tech Giants*, LAS VEGAS SUN (May 20, 2010, 2 AM), <http://www.lasvegassun.com/news/2010/may/20/little-lv-patent-firm-takes-tech-giants/>. Based on a review of the assignment record, using the following link, only seven patents were found. *Assignments on the Web*, U. S. PATENT & TRADEMARK OFFICE, <http://assignments.uspto.gov/assignments/?db=pat> (use search term “synchrome” in searchbox “Assignee Name”).

235. Ewing, *supra* note 102, at 68 (“At least four patent lots purchased at auction by NPEs have been used in patent litigation.”).

patents of all time.<sup>236</sup> Other famous independent inventor-litigants include Jerome Lemelson, discussed earlier,<sup>237</sup> and Robert Kearns, whose dispute with U.S. car companies over intermittent windshield wiper technology was popularized in the movie, *Flash of Genius*.<sup>238</sup> Microsoft cofounder Paul Allen has used the patents of his former startup, Interval Corporation, to sue high-profile internet companies.<sup>239</sup>

While success in the courtroom varies, independent inventors tend to share certain characteristics. Often lacking the deep pockets of practicing companies, individual inventors are more likely to partner with contingency-fee lawyers in their patent-assertion campaigns.<sup>240</sup> Because they have often also developed the patents they assert, individual inventors are perceived to be more personally invested in the suits they bring than are companies who buy their patents in the marketplace.<sup>241</sup> This may explain why such suits tend to last longer than those brought by other types of patentees.<sup>242</sup>

### 3. *Defensive Patenting Funds*

Some non-practicing entities buy patents defensively. Of the defensive aggregators, RPX is the largest. By February 2010, it had signed thirty-five members and spent more than \$200 million to acquire 1300 patents and patent rights, all in high-tech areas.<sup>243</sup> After buying patents, the company licenses them to their members, who pay an annual fee which has been between \$35,000 and \$4.9 million for rights to RPX's patent cache.<sup>244</sup> RPX reserves the right to sell or license the patents, with perpetual licenses to its members.<sup>245</sup> Following a similar business model, Allied Securities Trust ("AST") buys and licenses patents to its members and then seeks to sell the patents with the licenses, within a year,

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236. Allison et al., *supra* note 199, at 35–37.

237. See *supra* notes 79–85 and accompanying text.

238. FLASH OF GENIUS (Universal Pictures 2008); see Kearns v. Chrysler Corp., 32 F.3d 1541, 1543 (Fed. Cir. 1994); John Seabrook, *The Flash of Genius*, NEW YORKER, Jan. 11, 1993, at 39, 39.

239. Dionne Searcey, *Microsoft Co-Founder Launches Patent War*, WALL ST. J. (Aug. 28, 2010), <http://online.wsj.com/article/SB10001424052748703294904575385241453119382.html>.

240. Sandburg, *supra* note 85, at 2 ("Niro, Scavone, Haller & Niro . . . tends to represent little guys who can't afford to litigate against major corporations.").

241. Chien, *supra* note 5, at 1574.

242. *Id.* at 1605 tbl.6 (showing so-called "David v. Goliath suits," suits initiated by independent inventors, as lasting 14.6 months on average, longer than any single category).

243. *RPX Membership Jumps to 35 Companies*, RPX (Feb. 16, 2010), <http://www.rpxcorp.com/index.cfm?pageid=32&itemid=6> ("To date, RPX has invested over \$200 million to acquire more than 1,300 patents and patent rights in the mobile, Internet search, telecommunications, networking, consumer electronics, and e-commerce—including data and transaction processing—markets.").

244. *Id.*; Larry Dignan, *RPX: Can it Defend Against Patent Trolls?*, ZDNET (Nov. 24, 2008, 4:11 AM), <http://blogs.zdnet.com/BTL/?p=10993>.

245. *The "Free Rider" Fallacy*, RPX, <http://www.rpxcorp.com/index.cfm?pageid=14&itemid=8> (last visited Dec. 17, 2010).

following a “catch and release” strategy.<sup>246</sup> Following this business model, AST has reported that more than 80% of the money spent on patent acquisitions has been returned to its members.<sup>247</sup>

While these trusts can reduce some risk for their members, it is hard to tell whether they will really make a dent. Even assuming that the few thousands of patents bought by these two consortia represent lawsuits avoided, patent-assertion entities like IV, which already has 30,000 patents in its portfolio, are continuing to amass patents at a rapid pace.<sup>248</sup> The “release” portion of the aggregator strategy also arguably subjects non-members to greater risks from patent-assertion entities who must focus their efforts on fewer targets that do not belong to the trust.

#### 4. Startups

Startups are recently formed companies that do not have a long operating history.<sup>249</sup> Whether comprising a few founders or a multi-person operation, individual startups are generally engaged in developing and commercializing their products.<sup>250</sup> As such they are often not actively “practicing” their inventions but rather preparing to do so. In response to the 2008 Berkeley Patent Survey, startups reported that the main reasons they patent are to deter others from copying and to attract financing.<sup>251</sup> The least important of several possible reasons for obtaining patents was to monetize them through licensing activities,<sup>252</sup> one way in which startups differ from patent-assertion entities.

### C. THE COMPLEX PATENT ECOSYSTEM

Within the ecosystem occupied by the actors just described, no one paradigm—arms race or marketplace—dominates. Product companies that use patents solely to protect their revenue against competitors have become a minority. A wide variety of companies and patent uses have taken their place. The competing and even contradictory approaches of

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246. Victoria Slind-Flor, *Sun, eBay, Rock & Republic, Troyer: Intellectual Property*, BLOOMBERG (July 1, 2008, 12:01 AM), <http://www.bloomberg.com/apps/news?pid=conewsstory&refer=conews&tkr=1149L:US&sid=a170xRS4IR9w> (internal quotation marks omitted).

247. *Allied Security Trust Announces Availability of Major Patent Portfolio: Providing Opportunity for Anyone to Take a License Prior to the Upcoming Portfolio Sale*, MARKETWIRE (Jan. 26, 2010, 9:00 AM), <http://www.marketwire.com/press-release/Allied-Security-Trust-Announces-Availability-Major-Patent-Portfolio-Providing-Opportunity-1107124.htm>.

248. Steven Lohr, *Turning Patents Into ‘Invention Capital,’* N.Y. TIMES, Feb. 18, 2010, at B1.

249. Antonio Davila et al., *Venture Capital Financing and the Growth of Startup Firms*, 18 J. BUS. VENTURING 689, 690–91 (2003).

250. Ronald J. Gilson, *Locating Innovation: The Endogeneity of Technology, Organizational Structure, and Financial Contracting*, 110 COLUM. L. REV. 885, 894–95 (2010) (describing the process by which startups are created initially, by forming an idea, securing venture capital, and then using that capital to develop the original idea to become successful).

251. Graham et al., *supra* note 1, at 1299, fig.2 (2009).

252. *Id.*

the arms race and marketplace operate alongside each other, not only within industries, but also oftentimes within companies. A company may use certain patents defensively to gain freedom to operate, but it may also opportunistically sell its patents or sue upon them. It may enjoy patent *détente* with certain of its competitors while also exploiting the asymmetric stakes it has with companies whose products are covered by its patents. Some non-practicing entities sue established companies for infringement of patents they have acquired, and others develop their own technology and seek to commercialize it. Each company is unique, and the approach a company takes to its patents in one area may differ significantly from the approach it takes in another. These profiles make it harder to make value judgments about companies based solely on whether they do or do not practice their patents.

### III. THE LEGACY OF THE PATENT COLD WAR

The previous two Parts describe the new complex patent ecosystem. The following three Parts explore its implications for the way we think about the patent system. In Part III, I explore the impact of defensive patenting on the new complex ecosystem. Defensive patenting has likely helped companies avoid some lawsuits.<sup>253</sup> However, patent arsenals have left companies defenseless against patent-assertion entities and vulnerable to claims of other practicing companies that sue in areas where they do not practice. Defensive patenting has arguably also taken its toll on the patent system—driving the demand for low-quality patents, consuming company resources and time, and creating a large number of unused patents. These dynamics form the complicated legacy of the patent cold war for the new complex ecosystem.

#### A. THE FALLACY OF DEFENSIVE PATENTING

Companies file for patents defensively in order to gain freedom to operate.<sup>254</sup> However, the grant of a patent does not confer a positive right to practice one's own inventions; rather, it gives patentees the right to exclude others from making, using, or selling their inventions.<sup>255</sup> Defensive-patenting theory glosses over this distinction and equates patents with the positive right to practice instead of a negative right to exclude.<sup>256</sup> In a "cold war" environment in which players patent and

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253. Although it has not stopped companies from engaging in significant patent battles, for example, over 3G wireless technology, see Chien, *supra* note 5, at 1584, or smartphones, as described in Don Clark & Shayndi Raice, *Corporate News: Tech Firms Intensify Patent Spats—Spate of Lawsuits Concentrate on Mobile-Phone Market as Rivals Aggressively Seek Strategic Edge*, WALL ST. J., Oct. 4, 2010, at B3.

254. FED. TRADE COMM'N, *supra* note 60, at 52.

255. See 35 U.S.C. § 287 (2006).

256. I thank John Duffy for emphasizing this to me.

practice related inventions, however, this association approximates reality: a company's patent portfolio protects it from attacks.

Today's complex patent ecosystem exposes the logical fallacy behind defensive patenting. The right to exclude has lost its force in a world that pits practicing companies against patent-assertion entities and corporate "trolls."<sup>257</sup> In the late 2000s, the share of all high-tech patent suits brought by non-practicing entities had risen to 20%.<sup>258</sup> For some product companies, the proportion of suits brought by patent-assertion entities as compared to all suits has been much higher, comprising "virtually all" of them.<sup>259</sup> As President Obama has said, "the threat of global nuclear war has gone down, but the risk of a nuclear attack has gone up."<sup>260</sup> Many high-tech companies feel the same way about patent disputes: While company relations with competitors are relatively stable, they find themselves increasingly vulnerable to the demands of patent-assertion entities.<sup>261</sup>

#### B. A PARTIAL TRUCE

Although defensive patenting has been ineffective against patent-assertion entities, it has likely contributed to the filing of fewer suits between competitors, certainly fewer than otherwise could have been filed over the past two decades. While it is hard to isolate the chilling effect attributable to the threat of retaliatory patent suits, as opposed to other deterrents to lawsuits such as company reputation, interdependence, and culture, the arms race almost certainly has made companies think twice before initiating litigation. Despite what has likely been the widespread cross-infringement of patents by companies in high-tech industries, no company with a large patent portfolio has been driven out of business by patent litigation thus far.

At the same time, however, defensive patenting has failed to bring about systemic "patent peace" between large companies. Suits between large companies<sup>262</sup> over high-tech inventions represent 28% of all high-

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257. However, by obtaining a patent defensively, a company prevents someone else from obtaining a patent over the same invention and makes it harder for related inventions to be patented, by creating prior art. I thank Eric Friedman for making this point to me.

258. Chien, *supra* note 5, at 1604 fig.2 & n.168. Suits by individuals and nonprofits accounted for another 6% of suits in the dataset studied and were not included in this total. *See id.* at 1600 tbl.3.

259. Yen, *supra* note 138, at 2 ("[V]irtually all of the litigation activity has been with non-practicing entities with no appreciable business of making or selling products or services.").

260. Barack Obama, President of the U.S., Remarks at Hradcany Square, Prague, Czech Republic (Apr. 5, 2009), *transcript available at* [http://www.whitehouse.gov/the\\_press\\_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered](http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered).

261. *Id.*

262. I defined a "large company" as a public company or private company with an annual revenue of over \$100 million. Chien, *supra* note 5, at 1612-14 app. A.

tech patent litigations.<sup>263</sup> In a study of high-tech patent suits, I found that such suits were not only more common than other types of suits, but that they also lasted longer. On average, suits between large companies lasted 14.0 months, while non-practicing suits took an average of 9.1 months to resolve.<sup>264</sup> These results suggest that defensive patenting has, at best, brought about a partial patent peace among practicing companies.

One reason for this may be that defensive patenting works best when the parties are equally matched, with portfolios that cover each other's products. As noted earlier, the new patent ecosystem features a high degree of asymmetry between patentees. Do these asymmetries in exposure contribute to the large numbers of suits between large companies? To answer this question, I compared plaintiffs and defendants in large company suits<sup>265</sup> and the high-tech industries they operated in, based on their NAICS and SIC codes.<sup>266</sup> I then analyzed the extent of overlap between the companies.

The results suggest that asymmetries between practicing companies are being exploited even in large company suits. Among the 575 hardware and software "large company" lawsuits between 2000 and 2008, less than a third of the suits involved head-on competitors, that is, companies with the same primary industry segment (Table 1). While some 40% of the cases involved some overlap, nearly a third of disputes involved companies that had no overlapping lines of business at all. As a share of all disputes, this means that less than 9% of all high-tech suits studied<sup>267</sup> involved large companies in the same primary line of business, while the remainder had some or no overlap. These findings are consistent with other empirical findings.<sup>268</sup> To some degree, they show that the arms race is succeeding at deterring litigation—less than 10% of

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263. *Id.* at 1603 tbl.5. In comparison, non-practicing entity suits comprised 19% of the total, and suits brought by individuals ("David versus Goliath" suits) comprised 4% of the total. *Id.*

264. *Id.* at 1605 tbl.6.

265. A suit in which the plaintiff and defendant each comprise a large company. See the methodology of identification described in *Of Trolls*, Chien *supra* note 5, at Part II.

266. Both code systems are used to describe various industries in U.S. commerce; the NAICS system was developed more recently. See *North American Industry Classification System*, US CENSUS BUREAU, <http://www.census.gov/eos/www/naics/> (last visited Dec. 17, 2010) ("The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. NAICS was developed under the auspices of the Office of Management and Budget (OMB), and adopted in 1997 to replace the Standard Industrial Classification (SIC) System.").

267. That is 29% of large company suits (referred to in the paper as "Sport of King" suits), which themselves comprised 28% of all high-tech suits. See *infra* tbl. 1.

268. See James Bessen & Michael J. Meurer, *The Patent Litigation Explosion* 18 tbl.3 (Bos. Univ. School of Law Working Paper Series, Paper No. 05-18, 2005), available at <http://ssrn.com/abstract=831685> (reporting that, among the 680 suits between public companies the authors studied, 29% involved "true competitors" in the same industry, 43% had overlapping product lines, and 28% had no industry overlap, based on comparison of party SIC codes).

all suits involved large companies in the same technology areas. However, they are also striking, because they provide empirical evidence that large companies are exploiting asymmetries in the patent system by targeting companies whose businesses differ, in some cases significantly, from their own.

TABLE I: INDUSTRY OVERLAP IN PATENT LITIGATIONS BETWEEN LARGE HIGH-TECH COMPANIES FROM 2003 TO 2008 ( $n = 575$ )

Extent of Industry Overlap	Match of Primary Industry Segment	Non-primary Industry Segment Overlap	No Overlap
NAICS	29%	39%	32%
SIC	30%	39%	31%

While the data reported in Table I describes various types of high-tech suits, it does not measure “avoided” suits. Patent licenses can serve as a proxy for such suits insofar as they represent patent truces reached without resort to litigation. The literature on patent pools, voluntary organizations whose purpose is to “pool[] a group of patents into a single licensing package,”<sup>269</sup> provides insight into why negotiations between parties may break down.

Patent pools that represent a “preemptive attempt to quash . . . [patent] fighting”<sup>270</sup> have the same aims as defensive patenting. Though they come in many varieties, pools that feature vertically integrated firms essentially act as large industry cross-licenses.<sup>271</sup> In such pools, contributors to the pool both own the patent and manufacture the technology and therefore, pay into and receive royalties from the pool. However, patent pools can fail when parties “can’t decide who gets what. Everyone thinks their portfolio is more valuable . . . .”<sup>272</sup> Rather than opting into a patent pool, a non-joiner may choose to press for licenses on its own terms or to reserve the right to litigate.<sup>273</sup> Thus, even when company portfolios overlap, they rarely will be equally matched, either in

269. Anne Layne-Farrar & Josh Lerner, *To Join or Not To Join: Examining Patent Pool Participation and Rent Sharing Rules*, INT’L J. INDUS. ORG. (forthcoming 2011) (manuscript at 2), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=945189](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=945189).

270. Maisie Ramsay, *Diving into the LTE Patent Pool*, WIRELESS WEEK (May 20, 2009), <http://www.wirelessweek.com/Articles/2009/05/Diving-Into-the-LTE-Patent-Pool/> (“[The proposed patent pools] are merely a preemptive attempt to quash the type of IPR fighting that happened in 3G and grow adoption for the technology,” says James Brehm, analyst with Frost & Sullivan.” (alteration in original)).

271. Layne-Farrar & Lerner, *supra* note 269, at 13 (“Vertically integrated firms manufacture products embodying the standard and so they benefit from pools through lower costs in cross-licensing the necessary patents.”).

272. Ramsay, *supra* note 270 (quoting Derek Aberle, President of Technology Licenses, Qualcomm).

273. Layne-Farrar & Lerner, *supra* note 269, at 6.



reality, or in the opinion of the parties. Sometimes, for competitive reasons, companies will want injunctions, not royalties. Such factors will lead companies to initiate litigation, even against defendants with large portfolios.

### C. THE IMPACT OF THE PATENT ARMS RACE ON THE PATENT SYSTEM

The promise of the patent arms race is more patents and fewer lawsuits. While defensive patenting has likely led to fewer of certain types of lawsuits, it has unequivocally led to more patents. Although companies build patent portfolios for many reasons,<sup>274</sup> defensive motives in particular drive the accumulation of large numbers of low-cost patents. Other motives for building patent portfolios are less likely to be associated with large patent portfolios and the companies that acquire them. The large companies that top the list of patentees,<sup>275</sup> year after year, do not generally need to file for patents in order to attract investment or to signal the company's value—there are more direct measures of their performance, including revenue and new product introductions. Patents are needed, however, to cross-license, deter litigation, and prevent others from patenting the same invention. As one panelist commented during the 2009 FTC hearings, “from a defensive perspective having a portfolio that has heft and [is] perceived to have critical mass is really important.”<sup>276</sup> In today's complex patent ecosystem, from a defensive perspective, size still matters.<sup>277</sup>

In this Part, I consider the impact of defensive patenting on the patent system. Scholars have previously worried that excessive patenting is problematic, because it drives up the cost of entry for small firms.<sup>278</sup> While empirical research suggests that entry into the software industry

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274. See, e.g., Parchomovsky & Wagner, *supra* note 63, at 31–39 (citing scale and diversity features of patent portfolios); see also Stuart J.H. Graham & Ted Sichelman, *Why Do Start-Ups Patent?*, 23 BERKELEY TECH. L.J. 1063, 1063–70 (2008) (listing reasons, including maintaining supra-competitive prices, generating license revenue, developing an arsenal for cross-licensing, securing investment and financing, shielding, bullying, blocking and preemptively patenting, substituting for nondisclosure agreements, and enhancing a company's image).

275. In 2009, for example, the top companies were IBM, Samsung, Hitachi, Microsoft, Canon, Intel, Panasonic, Toshiba, Fujitsu, and Sony. INTELL. PROP. OWNERS ASS'N, TOP 300 ORGANIZATIONS GRANTED U.S. PATENTS IN 2008 I (2009), available at <http://www.ipo.org/AM/Template.cfm?Section=Home&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=22339>.

276. *Evolving Marketplace III*, *supra* note 57, at 128 (statement of Horacio E. Gutierrez, Corporate Vice President & Deputy General Counsel, Microsoft Corp.).

277. See, e.g., *Evolving Marketplace I*, *supra* note 40, at 87 (testimony of Sarah Harris, Vice President & Chief IP Counsel, AOL LLC) (“[AOL] ha[s] been able to come back and use our portfolio defensively, so that's really promoted and encouraged us to continue filing more patent applications . . .”); *id.* at 83 (testimony of Russ Slifer, Chief Patent Counsel, Micron Technology, Inc.) (describing that the need for a large portfolio continues to drive filing for a large number of patents).

278. See, e.g., ERIC VON HIPPEL, THE SOURCES OF INNOVATION 53 (1988) ([T]he true value [of a patent grant] is negative because it requires all to assume the overhead burden of defensive patenting.”).

has remained robust, and that researchers in other industries have not in fact been deterred by “over” patenting,<sup>279</sup> I argue that the practice of defensive patenting has had other, largely overlooked, side effects. These side effects contribute to the problem of low patent quality and create large numbers of unused patents that, in today’s complex patent ecosystem, ironically have the potential to increase, rather than to decrease, patent hold-up.

*I. High-Volume, Low-Cost, and Quality Patenting*

If a patentee plans to hold the majority of its patents defensively, rather than to assert or enforce them offensively, the patents do not need to be high-quality. Since the patents are unlikely to ever be tested in court, or even in a licensing negotiation, the quantity of patents, rather than the quality of any individual patent, is more important. For this reason, companies that patent defensively have adopted a high-volume, low-cost approach to building their portfolios.<sup>280</sup> They invest a limited amount of company time in each patent and are unlikely to conduct pre-patentability searches.<sup>281</sup> Fixed-fee, fee cap, and volume pricing arrangements may be used to reduce costs.<sup>282</sup> According to a 2008 account, a typical high-volume, low-cost patent filing program was priced at around \$7500 per application and \$1800 per U.S. office action response,<sup>283</sup> about 25% less than the average.<sup>284</sup> When companies make it their objective to file for a certain number of patents<sup>285</sup>—whether set by investor expectations, competitive benchmarking, or another process—the focus tends to be on the question, “what can I patent?” instead of “what is this patent’s strategic objective?”

The limited investment made in each individual patent contributes to lower-quality examination as well, making it less likely that patentees will take the time to provide meaningful information to the USPTO

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279. Robert P. Merges, Patents, Entry and Growth in the Software Industry 12–13 (Aug. 1, 2006) (unpublished article), available at <http://ssrn.com/abstract=926204>; see also Rebecca S. Eisenberg, *Noncompliance, Nonenforcement, Nonproblem?: Rethinking the Anticommons in Biomedical Research*, 45 HOUS. L. REV. 1059, 1061 (2008) (describing empirical studies that suggest fears that upstream patents will deter downstream research have largely failed to materialize); Ronald J. Mann, *Do Patents Facilitate Financing in the Software Industry?*, 83 TEX. L. REV. 961, 968 tbl.1 (summarizing the positive effects of patents for prerevenue startups, later-stage startups, and large firms).

280. See generally Parchomovsky & Wagner, *supra* note 63; see also Craig Opperman & Carina Tan, *Getting Less for More*, INTELL. ASSET MGMT., Dec./Jan. 2008, at 8, 8–9, (discussing low-cost, volume-based patenting).

281. Sterne et al., *supra* note 15, at 22.

282. *Id.*

283. Opperman & Tan, *supra* note 280, at 8–9.

284. As compared to an average price of \$10,993 for a relatively complex new electrical/computer application and \$3165 for an amendment/argument. AM. INTELL. PROP. LAW ASS’N, REPORT OF THE ECONOMIC SURVEY app. at I-73–I-74 (2007).

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

regarding the references they are obligated to disclose. The Public Patent Advisory Committee has commented,

Candidly, a further cause of ever-increasing pendency is clearly applicants' behavior itself. From . . . the late filing of information disclosure statements (IDS), to the failure to file any illuminating information, or the inclusion of large numbers of less relevant references in such statements, applicants severely and directly impact an examiner's ability to perform focused, timely and quality examinations.<sup>286</sup>

When a company begins to patent, its first priority is to protect its "platform" or "pioneering" technologies. Along with patents on new innovations, a company will defensively acquire non-core, "portfolio-builder" patents that cover smaller, more incremental inventions, which are further removed from the company's core operations and represent inventions with limited commercialization potential.<sup>287</sup> The net effect is that patents acquired primarily for defensive reasons are likely not only to have received less time and attention, but also to cover less important, more marginal inventions. By creating a demand for patents that are never intended to be enforced, the patent arms race has arguably contributed to the problem of low-quality patents.

## 2. Patent Backlog

Defensive patenting has also been blamed for exacerbating backlog at the USPTO.<sup>288</sup> Although average pendencies have grown across the board,<sup>289</sup> applications examined in the computer software, architecture, and communications technology centers at the USPTO have had to wait significantly longer to receive examination. In 2008, for example, the USPTO took five-to-seven months longer to begin examination of applications in these technology areas, and they spent nearly a year longer in examination, on average.<sup>290</sup>

Not surprisingly, in the technology areas where backlog has been the longest, exceptionally strong growth in new applications has also

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286. 2007 USPTO ANN. REP. 10 [hereinafter USPTO ANN. REP.] ("[Fee] diversion, a larger percentage of complex applications, and applicant behavior have combined to create the 'perfect storm' of factors leading to historic levels of unexamined patent applications.").

287. See, e.g., Bill Barrett, *Defensive Use of Publications in an Intellectual Property Strategy*, 20 NATURE BIOTECHNOLOGY 191, 192 (2002) (discussing the strategy of patenting "incremental inventions").

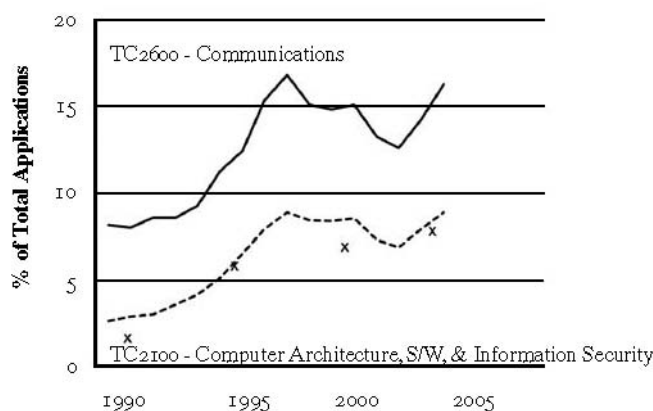
288. *Competition FTC Hearing II*, *supra* note 16, at 675 (statement of Robert Barr, Vice President for IP and Worldwide Patent Counsel, Cisco Systems, Inc.).

289. USPTO ANN. REP., *supra* note 286, at 9 (describing increases in overall pendency from twenty-five months in 1999 to thirty-two months 2007, and up to forty-three months in some art areas).

290. *Performance and Accountability Report Fiscal Year 2008: Table 4: Patent Pendency Statistics*, U.S. PATENT & TRADEMARK OFFICE, [http://www.uspto.gov/web/offices/com/annual/2008/oai\\_05\\_wlt\\_04.html](http://www.uspto.gov/web/offices/com/annual/2008/oai_05_wlt_04.html) (last visited Dec. 17, 2010) (showing applications examined in the computer architecture, software, and information security and communications technology centers as having longer times to first action and a longer average pendency than any other in the USPTO).

occurred. The percentage of overall applications in these areas doubled or tripled between 1990 and 2005 (Figure 2).<sup>291</sup> The growth of these new applications has apparently outpaced the USPTO's ability to scale up its examination resources.

FIGURE 2: NEW PATENT APPLICATIONS AT THE USPTO



(Source: USPTO, author analysis)

Although it is unclear how much of the blame patentees really deserve for the backlog, a lack of focus on the applicant side can slow the examination process. The backlog impacts all users of the system, as important patent applications languish along with the less important ones in the line at the USPTO.<sup>292</sup>

### 3. Patent Stockpiles

Another consequence of the patent arms race is that it has left practicing companies with large numbers of unused patents. By unused, I mean that these patents are not being practiced and lack strategic value.<sup>293</sup> BTG International has found that two-thirds of all U.S. firms have patent assets that they fail to exploit.<sup>294</sup> According to one estimate, “at least 20 percent of [most significant patent portfolios] could be sold with no negative impact on the IP position, either offensively or defensively.”<sup>295</sup> As described earlier, the cultural barriers that have

291. *Patent Application Full Text and Image Database*, U.S. PATENT & TRADEMARK OFFICE, <http://appft1.uspto.gov/netahtml/PTO/search-bool.html> (last visited Dec. 17, 2010). The table was created based on the information in this database.

292. See expansion of this sentiment in *Competition FTC Hearing II*, *supra* note 16, at 681 (statement of Robert Barr, Vice President for IP and Worldwide Patent Counsel, Cisco Systems, Inc.).

293. See, e.g., DAVIS & HARRISON, *supra* note 22, at 145 (describing Dow's classification, in 1993, of its patents into three categories, including “No Business Interest (available for licensing, allow to expire, abandon),” and noting that 25% of its patents proved to be in this category).

294. PHELPS & KLINE, *supra* note 35, at 138.

295. McCurdy, *supra* note 149, at 15.

historically prevented practicing companies from selling their patents have begun to disintegrate. As they do, more companies have made their patents available for sale.<sup>296</sup>

The patent marketplace now provides a way for companies to dispose of their unused patents. However, it also creates a risk that the patents will be used to hold-up other practicing companies, at a cost that far exceeds what the practicing company itself could have demanded for the patent. As Brian Kahin has said, the new patent environment is characterized by a “growing temptation to release patents from portfolios to those who can make ‘better’ use of them,” without fear of public reprisal, counter-assertions, or repeated interactions with competitor targets.<sup>297</sup> As detailed below in Part IV.A, a number of corporate origin patents have been sold to entities that have turned around and asserted them against other practicing companies.

#### D. THE LEGACY OF THE PATENT ARMS RACE

In sum, then, the patent arms race has had impacts on the patent system that extend beyond the simple formula of more patents, fewer lawsuits. While deterring some suits, patent arsenals have left companies defenseless against patent-assertion entities, which do not create anything, as well as against practicing companies, who sue in areas where they do not operate. Defensive patenting has also taken its toll on the patent system—driving the demand for low-quality patents and creating a large number of unused patents. While these developments do not justify the wholesale abandonment of defensive patenting, which has had some deterrent effect, they do reveal an overlooked contributor to patent quality and patent hold-up problems: the patent arms race.

#### IV. PATENT PATHWAYS AND PATENT VALUE IN THE COMPLEX PATENT ECOSYSTEM

In the previous Part, I discussed the impact of the patent arms race on the complex patent ecosystem. In this Part, I address the implications of changes to the patent ecosystem for how patents are valued. According to an important strand of patent literature, a patent’s value and the related likelihood of litigation can be predicted by looking at the characteristics of the patent at the time of issue. Attributes such as the number of claims, time in prosecution, and amount of prior art cited by the patent are assumed to predict into which of two camps a patent will fall: “worthless”—likely to sit on the shelf and never to be enforced—or “valuable.”<sup>298</sup>

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296. See *supra* Part I.B.2.a; *supra* note 198 and accompanying text.

297. See Kahin, *supra* note 6, at 11.

298. See, e.g., John Allison et al., *Valuable Patents*, 92 GEO. L.J. 435, 436–37 (2004) (developing a

Several proposals to address patent quality are built around the core assumption that certain patents are objectively more valuable than others, and that this can be determined prospectively.<sup>299</sup> One proposal is deferred examination, which assumes that patent applicants can tell which patents are important during the patent prosecution process.<sup>300</sup> Another proposal is to “gold-plate” patent prosecution, which would require patent applicants to elect which track a patent should be examined during prosecution.<sup>301</sup>

However, in the current complex patent ecosystem, a patent may change hands several times during its life. As a patent traverses its patent “pathway,” it gains a new context and a new purpose. The value a patentee is likely to extract from a patent by asserting it against others—what I call the “exclusion value” of a patent—can fluctuate considerably as the patent is sold. In the following paragraphs, I describe several cases and mechanisms by which patents have gone from defensive to offensive, and vice versa, as they have been bought and sold on the patent marketplace. I then discuss the implications of these patent pathways for theories of patent value.

#### A. OFFENSIVE USES FOR DEFENSIVE PATENTS

As described earlier, companies have found a number of ways to offensively assert portfolios of patents initially developed defensively. A number of companies, like Harris and American Express, have found it profitable to enforce, through licensing, their once defensive portfolios.<sup>302</sup> Others, like General Electric, have organized company subsidiaries to sue companies in technology areas in which they do not practice.<sup>303</sup> Practicing company patents, when sold on the market, can also end up being asserted by patent-assertion entities. In a forthcoming study of patents litigated by the “most litigious” patentees, Risch reports that

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profile of valuable patents based on an empirical analysis); Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1507 n.55 (2001) (estimating that only 5% of patents are the subject of licensing and 1.5% are the subject of litigation, and noting that the balance is largely ignored); Kimberley Moore, *Worthless Patents*, 20 BERKELEY TECH. L.J. 1521, 1522–25 (2005).

299. Allison, *supra* note 298, at 438 (“Our data conclusively demonstrate that valuable patents differ in substantial ways from ordinary patents both at the time the applications are filed and during their prosecution.” (emphasis added)).

300. See, e.g., Steven Bennet & David Kappos, *Inside Views: Deferred Examination: A Solution Whose Time Has Come*, INTELL. PROP. WATCH (Mar. 12, 2009), <http://www.ip-watch.org/weblog/2009/03/12/inside-views-deferred-examination-a-solution-whose-time-has-come/> (describing deferred examination as a process in which applicants can decide which applications are “most important” and which are less important).

301. See Doug Lichtman & Mark A. Lemley, *Rethinking Patent Law’s Presumption of Validity*, 60 STAN. L. REV. 45, 50 (2007); see also Mark A. Lemley et al., *What to Do About Bad Patents?*, REGULATION, Winter 2005–2006, at 10, 12.

302. See discussion *supra* Part II.A.2.

303. See discussion *supra* Part II.A.2.

over a third came from public companies or their subsidiaries.<sup>304</sup> Some of the more prominent examples of corporate-origin patents being asserted by patent-assertion entities are discussed below.

Saxon Innovations is a patent-assertion entity that has brought enforcement actions in U.S. district court and in the International Trade Commission.<sup>305</sup> Its campaigns are based on a patent portfolio comprised of nearly 200 patents covering technology developed by chipmaker Advanced Micro Devices (“AMD”).<sup>306</sup> Saxon acquired the patents in 2007 by acquiring Legerity, an AMD spinoff, from another company called Zarlink.<sup>307</sup> Using these patents, Saxon has obtained licenses from LG Electronics Inc., HTC Corporation, Nokia Corporation, and Research In Motion Limited<sup>308</sup> and sued Apple,<sup>309</sup> Nokia,<sup>310</sup> Casio,<sup>311</sup> and Samsung.<sup>312</sup>

Similarly, around fifty patents of Conexant, a publicly traded semiconductor company that makes integrated circuits for various electronic devices,<sup>313</sup> have ended up in the hands of a three-person patent-enforcement entity called WiAV, LLC.<sup>314</sup> The assignment history of the patents reveals a convoluted past. From Conexant, which was once a subsidiary of Rockwell International Corporation, the patents were assigned to Washington Sub, a wholly owned subsidiary that merged into Alpha Industries and then changed its name to Skyworks Solutions, Inc.<sup>315</sup> Skyworks’ patents were then assigned to WiAV.<sup>316</sup> Using this

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304. See Michael Risch, *Untitled Empirical Study of Non-Practicing Entities 18–19* (unpublished manuscript) (draft on file with author).

305. *Saxon Innovations Files Complaint in International Trade Commission*, SAXON INNOVATIONS, LLC (Jan. 5, 2009), <http://www.saxoninnovations.com/Press.html> (select link entitled “Saxon Innovations Files Complaint in International Trade Commission”).

306. *About Saxon Innovations, LLC*, SAXON INNOVATIONS, LLC, <http://www.saxoninnovations.com/About.html> (last visited Dec. 17, 2010).

307. Zarlink Semiconductor Inc., *Material Change Report (Form 51-102F3)* 4 (June 25, 2007).

308. *Altitude Capital Partners Sells Saxon Innovations*, PR NEWSWIRE (Feb. 18, 2010), <http://www.prnewswire.com/news-releases/altitude-capital-partners-sells-saxon-innovations-84701297.html>.

309. *Second Amended Complaint at 1, Saxon Innovations, L.L.C. v. Apple, Inc.*, No. 08-CV-00265-JDL (E.D. Tex. May 14, 2009).

310. *Saxon Innovations, L.L.C. v. Nokia Corp.*, No. 6:07-CV-490, 2009 U.S. Dist. LEXIS 89933, at \*1 (E.D. Tex. Sept. 29, 2009) (asserting, for example, patent 5247621).

311. *Complaint at 1, Saxon Innovations, L.L.C. v. Casio Computer Co.*, No. 09-CV-00270-LED (E.D. Tex. June 25, 2009) (asserting the same patent as it did against Nokia Corp.).

312. *Complaint at 1, Saxon Innovations, L.L.C. v. Samsung Elecs. Co.*, No. 09-CV-00067-LED (E.D. Tex. Feb. 18, 2009) (asserting, for example, patent 5235635).

313. *About Conexant*, CONEXANT, <http://www.conexant.com/company/about.html> (last visited Dec. 17, 2010).

314. WiAV SOLUTIONS, LLC, <http://wiavsolutions.com/> (“[WiAV] is in the business of developing advanced digital wireless technologies. [WiAV] also acquires, develops, licenses and enforces patents.”) (last visited Dec. 17, 2010); see also *WiAV Solutions LLC v. Motorola, Inc.*, No. 3:09cv447, 2009 U.S. Dist. LEXIS 96994, at \*4 (E.D. Va. Oct. 20, 2009) (“[A]ll three of WiAV’s employees work out of the [company’s] Vienna office.”).

315. *Conexant Systems Inc., Amended Current Report (Form 8-K/A) F-1* (Jul. 10, 2002).

Conexant-developed portfolio, WiAV has sued Motorola, Kyocera, RIM, and Apple, among others.<sup>317</sup>

In the largest corporate patent sale to a patent-assertion entity to date, Micron, the largest U.S. maker of computer memory chips, sold 4500 patents to seasoned patent litigator John Desmarais.<sup>318</sup> The patents cover chipmaking, photo imaging, search, and radio frequency identification, and represent some 20% of Micron's entire portfolio.<sup>319</sup> Desmarais's law firm, Round Rock Research LLC, has offered the patents for license<sup>320</sup> and sued at least one company.<sup>321</sup> According to a study performed by CPA Global's monetization specialist, a subset of the patents are of very high quality.<sup>322</sup> Micron made the sale, according to its SEC filings, to help the company recoup some of its technology investments.<sup>323</sup> Micron's counsel has previously spoken publicly about the negative impacts of patent-assertion entities,<sup>324</sup> opening the company up to potential charges of hypocrisy in entering into, and potentially continuing to have a stake in, Desmarais's enforcement activities.<sup>325</sup>

#### B. DEFENSIVE USES FOR OFFENSIVE PATENTS

The previous Part provides several examples of how defensive patents have been made available, through the patent market or corporate reorganization, for offensive campaigns. Trading in patents has created additional options for defensive strategies as well. When a practicing company is sued by another practicing company, it may be able to defend itself by buying patents from the marketplace. Companies

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316. Based on a review of the assignment record, using the following link, eighty-eight patents were assigned by Skyworks to WiAV. *Assignments on the Web*, U.S. PATENT & TRADEMARK OFFICE, <http://assignments.uspto.gov/assignments/q?db=pat&reel=019899&frame=0305> (use "019899" and "0305" in searchboxes "Reel" and "Frame" respectively).

317. See Complaint at 1, *WiAV Solutions LLC v. Kyocera Corp.*, No. 09-CV-00373-REP (E.D. Va. June 15, 2009); Complaint at 1, *WiAV Solutions LLC v. Research In Motion, Ltd.*, No. 08-CV-00627-REP (E.D. Va. Sept. 26, 2008).

318. Kolker, *supra* note 88.

319. *Id.*

320. *Id.*

321. Zach Lowe, *John Desmarais Takes First Shot as Patent Holder*, AM. LAW., Oct. 7, 2010, [http://www.law.com/jsp/cc/PubArticleCC.jsp?id=1202473041370&John\\_Desmarais\\_Takes\\_First\\_Shot\\_as\\_Patent\\_Holder](http://www.law.com/jsp/cc/PubArticleCC.jsp?id=1202473041370&John_Desmarais_Takes_First_Shot_as_Patent_Holder).

322. Gregoire Marino, *More News on the Micron Patent Sale: What Is Really Happening Behind the Curtains?*, IP FIN. (June 15, 2010), <http://ipfinance.blogspot.com/2010/06/more-news-on-micron-patent-what-is.html>.

323. Micron Technology, Annual Report (Form 10-K) 8 (Oct. 28, 2009) ("[Micron] has recovered some of its investment in technology through sales of intellectual property rights to joint venture partners and other third parties.").

324. See *Competition FTC Hearing II*, *supra* note 16, at 685-86 (statement of Joel Poppen, Dir. of Patent Litigation & Licensing, Micron Technology, Inc.).

325. Joff Wild, *The Questions that Micron Technology Will Not Answer*, IAM MAG. (June 8, 2010), <http://www.iam-magazine.com/Blog/Detail.aspx?g=4768d19e-571c-452b-ac56-a3b9e22fe19>.



can also use the marketplace to quickly adapt their patent portfolios to their defensive, or other, objectives.

One of the main reasons for having a defensive portfolio is to give the holder of the portfolio a way to retaliate if it is sued. However, if the accused does not have patents relevant to the plaintiff's operations, it may be able to turn to the patent marketplace. Several companies have successfully used this tactic to neutralize lawsuits brought against them. In *Hewlett-Packard v. Acer, Inc.*, described below, the patents were held by patent-assertion entities before being used by a practicing company in its counter assertion against another practicing company. In *Matsushita v. Samsung*, a practicing company defendant bought a patent for defensive purposes from a patentee several months before it went bankrupt.

In March 2007, Hewlett Packard brought a suit against rival corporation, Acer.<sup>326</sup> Several months later, Acer bought several patents from Industrial Technology Research Institute,<sup>327</sup> a Taiwanese research organization that licenses its technology.<sup>328</sup> It asserted these in a countersuit against HP.<sup>329</sup> By mid-2008, the lawsuit was settled.<sup>330</sup>

In a suit filed on January 25, 2002 by Matsushita Electric against Samsung, Samsung counterclaimed for infringement of patent 5,481,693.<sup>331</sup> Samsung had bought the patent from SonicBlue Inc,<sup>332</sup> several months after the assignment, SonicBlue filed for Chapter 11 bankruptcy protection.<sup>333</sup> Over the course of the litigation, Samsung also counterclaimed patents that it had previously obtained from a government agency<sup>334</sup> and from other practicing companies.<sup>335</sup>

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326. *Hewlett-Packard Co. v. Acer, Inc.*, No. 02-07-CV-103-CE, 2008 U.S. Dist. LEXIS 25952, at \*3 (E.D. Tex Mar. 31, 2008).

327. See *Patent Assignment Query Menu*, U.S. PATENT & TRADEMARK OFFICE [hereinafter *Assignment History*], <http://assignments.uspto.gov/assignments/?db=pat> (search in "patent number" field for U.S. No. Patents "5977626", "6188132", "6788257", "6280021", showing execution dates to Acer in September and July of 2007).

328. *Who We Are*, INDUS. TECH. RESEARCH INST., <http://www.itri.org.tw/eng/about/article.asp?RootNodeId=010&NodeId=0101> (last visited Dec. 17, 2010).

329. Erica Ogg, *Acer Sues HP Again Over Patents*, CNET NEWS BLOG (Oct 31, 2007, 3:40 PM PDT), [http://news.cnet.com/8301-10784\\_3-9808687-7.html](http://news.cnet.com/8301-10784_3-9808687-7.html).

330. Press Release, Hewlett Packard, HP and Acer Settle Patent Litigation (June 8, 2008), <http://www.hp.com/hpinfo/newsroom/press/2008/080608a.html>.

331. Brief of Plaintiff at 5, *Matsushita v. Samsung*, No. 02-336, 2005 U.S. Dist. Ct. Motions LEXIS 32374 (D.N.J. 2005) ("MEI initiated this action against Samsung alleging infringement of three patents on January 25, 2002. In response, Samsung asserted five counterclaim patents against MEI: the '048 Patent, U.S. Patent No. 5,034,625 ('the '625 Patent'), U.S. Patent No. 5,481,693 ('the '693 Patent'), U.S. Patent No. 5,781,750 ('the '750 Patent'), and U.S. Patent No. 6,076,155 ('the '155 Patent').").

332. See *Assignment History*, *supra* note 327 (search in "patent number" field for U.S. No. Patent "5481693", showing transfer from SonicBlue to Samsung with an execution date of 11/14/2002).

333. Eric Hellweg, *SonicBlue's Bankruptcy: Big Media Wins*, CNNMONEY.COM (Mar. 27, 2003, 10:26 AM EST), <http://money.cnn.com/2003/03/27/technology/techinvestor/hellweg/index.htm> (describing SonicBlue's Chapter 11 filing).

334. See *Assignment History*, *supra* note 327 (search in "patent number" field for U.S. No. Patent 5181209, which was assigned from a Deutsche Forschungsanstalt fur Luft, Germany's aerospace

The foregoing examples demonstrate how companies have used patents offered for sale on the patent marketplace to supplement their own portfolios. In each case, a defendant company used a patent that had been bought, rather than developed internally, to counter a lawsuit. During litigation, a single relevant patent can be worth more than the contents of a large portfolio. As long as the right patents are available for sale, patentees can make acquisitions as-needed, relieving some of the pressure to anticipate and plan for disputes *ex ante*.

The extent to which the strategy of acquiring patents “on demand” will be useful remains to be seen, however. Patents on the most advanced and unique technologies are unlikely to be available in the market. Companies in highly competitive industries will not release their “crown jewel,” or even their lesser-jewel patents to the market, unless they are certain that they will not have a future use for them. The patent market is far from transparent, resulting in a risk that buyers and sellers will not be able to find each other. Still, as more properties enter the patent marketplace, buyers will likely find it increasingly attractive to buy portions of their patent portfolios from others, rather than only build them themselves.

### C. IMPLICATIONS FOR PATENT VALUATION

The “patent pathways” described above have implications for theories of patent valuation. Merchant banks and academics assume that patents have an objective value that can be estimated based on intrinsic qualities of the patent, such as the breadth of its claims, how much prior art it cites, and its prosecution history.<sup>336</sup> However, such valuation approaches focus only on characteristics of patents at the time of issue and neglect to consider what happens afterwards. The transactions described above remind us, however, that the strategy of the company holding a patent is predictive of the value that is likely to be captured

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research center).

335. *See id.* (search in “patent number” field for U.S. No. Patent 5781750, assigned from SonicBlue).

336. James E. Malackowski & Jonathan A. Barney, *What Is Patent Quality? A Merchant Banc's Perspective*, LES NOUVELLES: J. LICENSING EXECUTIVE SOC'Y INT'L, June 2008, at 123, 130, available at [http://www.oceantomo.com/system/files/What\\_is\\_Patent\\_Quality\\_lesNouvelles\\_6.08.pdf](http://www.oceantomo.com/system/files/What_is_Patent_Quality_lesNouvelles_6.08.pdf) (“In sample after sample, we find that higher patent maintenance rates are significantly correlated to the following: a larger number of independent and dependent claims; a smaller number of words per independent claim; a smaller number of different words per independent claim; longer written specifications; higher forward citation rates (both raw and age normalized); a larger number of backward citations; and a larger number of related patent family members (both domestic and international). More importantly, at least from a merchant banc's perspective, the calculated maintenance probabilities are significantly correlated to other observed patent value measures, such as commercialization rates, licensing rates, and litigation rates.”); *see also* Allison et al., *supra* note 298, at 437–38 (describing valuable patents, defined as “litigated” patents, as being young, domestically owned, more cited and citing, spending longer in prosecution, and having more claims than ordinary patents).

from that patent. The exclusion value of a patent is related to, but still distinct from, any objective value of a patent. This concept reflects the reality that a patent in the hands of a patent-assertion entity is much more likely to be exploited offensively than is the same patent when held by a practicing company that makes its money selling products.

This is not to say that approaches to objective patent valuation are not useful for those who transact in the patent marketplace and need to make quick assessments about the patents they buy or offer for sale. But for those making decisions about R&D and how to allocate scarce commercialization resources, the more relevant questions are, “which patents am I going to be sued upon?” and “how much value is likely to be captured from the patents that are in my technology space?” The marketplace allows barriers to exploitation of a patent that exist because of characteristics of the patent owner—for instance, due to a lack of resources or other revenue options, and vulnerability to countersuit—to be removed. The common-sense notion that who owns a patent is highly predictive, perhaps even the most predictive, of whether a patent will be asserted is worthy of empirical validation. A better understanding of these drivers of exclusion value could be instrumental in helping companies predict and potentially avoid technical areas where patent assertion is most likely.

## V. PATENT REFORM IN THE COMPLEX PATENT ECOSYSTEM

Earlier Parts of this Article describe how the complex patent ecosystem calls into question existing formulations of defensive patenting and patent value. In Part V, I consider implications of the complex patent ecosystem for reforming the patent system. To do so, I briefly review the rise of the patent arms race and patent marketplace paradigms that form the basis of the complex patent ecosystem. This review exposes a thus-far overlooked lever of change within the patent system: patentees themselves.

### A. BEHAVIORAL LEVERS IN THE PATENT ARMS RACE AND PATENT MARKETPLACE

One lesson taught by the history of both the arms race and the marketplace is that patentees are heavily influenced by the behavior of other patentees. For example, industry leadership, demonstration effects, and licensing practices have led firms to file for thousands of patents over the past two decades.<sup>337</sup> Likewise, the business of patent assertion has been catalyzed, not by any single legal development, but by the development and popularization of creative business models based on

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337. *See supra* Part I.A.

patent exploitation. In both cases, patentees have taken cues from their peers regarding how to patent, how much to patent, and how to use patents. They have observed and learned from each other's litigation and licensing experiences. Demonstration effects are important and can change behavior.

The insight that patentee behavior, independent of legal change, drives the patent system suggests new approaches for reforming the patent system. Conventionally, advocates and academics have concentrated their proposals for reforming the patent system on one of its three institutional pillars: Congress, the courts, and the USPTO.

With respect to patent quality, for example, existing proposals for reforming the patent system are focused on improving the *supply* of patents—for instance, by restoring full funding to the USPTO, heightening the standards for patentability, or allowing third parties or the public to help vet patents before and after they are issued.<sup>338</sup> However, in the paragraphs below, I suggest ways in which the *demand* for patents might be changed. These suggestions would try to harness the self-interest of patentees, in order to improve patent quality.<sup>339</sup>

Likewise, in order to reduce the patent hold-up associated with patent-assertion entities, companies have advocated making changes to patent law and procedure—for instance, by changing damages law, limiting where patentees can sue, and allowing the public to challenge patent applications before they issue.<sup>340</sup> While important, the scope and pace of changes to damages and related law are unpredictable. In addition, while patent-assertion entities have skillfully navigated the legal environment, they have relied primarily on non-legal tactics, such as secrecy, surprise, and willingness to litigate, to succeed against practicing companies. Below I suggest some ways in which some of these advantages can be neutralized.

#### B. IMPROVING PATENT QUALITY

Despite its limitations, defensive patenting continues to be an important component of patent strategy. The following paragraphs discuss ways in which defensive objectives may be served, while at the same time shifting the emphasis away from volume patenting and towards quality patenting.

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338. See generally Wegner, *supra* note 27 (describing a host of different patent quality proposals).

339. Making a related point, Polk Wagner argues that incentives to seek quality patents, and not merely legal tools, need to be leveraged to improve patent quality. Wagner, *supra* note 63, at 2144.

340. William New, *New Senate Patent Reform Bill Details Released*, INTELL. PROP. WATCH (Mar. 4, 2010, 10:29 PM), <http://www.ip-watch.org/weblog/2010/03/04/new-senate-patent-reform-bill-details-released/>.

### I. *Practice and Publicize Quality Patenting*

As explained previously, one of the primary reasons companies acquire many patents is because their competitors do. While companies like IBM and Microsoft celebrate their patent issuances,<sup>341</sup> highly innovative companies with relatively fewer patents get far less publicity for their patenting choices. The adoption of defensive patent strategies demonstrates the extent to which patentees can be influenced by others. What about publicizing quality rather than quantity-patenting strategies?

Several of the most active companies in the patent arms race have come forward to criticize its cost and effectiveness. In the early 2000s, Sun Microsystems and Cisco were both engaged in rapid patent portfolio building. Sun subscribed to a strategy of growing its “patent stockpile[] to use if attacked or as a form of mutual deterrence.”<sup>342</sup> Cisco filed for hundreds of patents each year in what they called “the only rational response” to the large number of patents in the industry.<sup>343</sup>

Recently, however, both companies have changed course. In 2008, the General Counsel of Sun, Mike Dillon, announced on his blog that the firm had decided a few years prior to reduce its annual patent filings from 1000 to closer to 700, “a significant decline for Sun [which] occurs during a period in which we have more innovation than at any point in Sun’s history.”<sup>344</sup> Rather than patenting “everything,” Dillon explained, the company had decided to file for fewer, more high-quality patents.<sup>345</sup> The move was motivated by the high costs of obtaining and maintaining patents and the realization that Sun’s business model only required enough patents to support its customers and to provide “a defensive response” as needed.<sup>346</sup> Cisco’s General Counsel and Senior Vice President Mark Chandler made a similar statement, in late 2009, about the company’s patenting strategy. He remarked that Cisco had also decided to move away from the quantity strategy it had once pursued.<sup>347</sup> Like Sun, Cisco had reduced its filings to focus on quality, bringing down

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341. Press Release, IBM, IBM Earns Most U.S. Patents for 17th Consecutive Year; Will Offer Licenses to Patent Portfolio Management Know-How (Jan. 17, 2010), <http://www.ibm.com/news/bh/en/2010/01/17/r544000b85854b33.html>; Andrew Nusca, *Microsoft Awarded 10,000th U.S. Patent*, ZDNET (Feb. 10, 2009, 11:52 AM), <http://research.microsoft.com/en-us/um/people/sdrucker/press/btl.htm>.

342. Mike Dillon, *The Patent Arms Race*, LEGAL THING (May 26, 2008, 8:00 PM), [http://blogs.sun.com/dillon/entry/the\\_patent\\_arms\\_race](http://blogs.sun.com/dillon/entry/the_patent_arms_race).

343. *Competition FTC Hearing II*, *supra* note 16, at 736 (statement of Robert Barr, Vice President for IP and Worldwide Patent Counsel, Cisco Systems, Inc.).

344. Dillon, *supra* note 342.

345. *Id.*

346. *Id.*

347. Michael Arndt, *Cisco’s Patent Strategy: It’s More Than Numbers*, BUS. WK. (Dec. 21, 2009), [http://www.businessweek.com/innovate/next/archives/2009/12/has\\_the\\_recessi.html](http://www.businessweek.com/innovate/next/archives/2009/12/has_the_recessi.html) (“The arms race approach doesn’t pay off . . . It doesn’t do you a lot of good to have a lot of patents.” (quoting Mark Chandler, General Counsel and Senior Vice President, Cisco Systems, Inc.) (internal quotation marks omitted)).

the number of patent applications per year from 1000 to 700.<sup>348</sup> While the 30% reduction in the number of new filings reported by these two companies does not necessarily represent a huge change to business-as-usual, the de-escalation in the patent arms race they represent is significant.

In-depth case studies of how companies have made the transition towards quality patenting and of the financial savings realized, or of how companies can build smaller, smarter patent portfolios from the start could help increase patent quality. If more companies come forward and describe alternatives to the conventional high-volume, low-quality approach to portfolio patenting, others may catch on. Just as portfolio patenting begets more portfolio patenting, quality patenting may beget more quality patenting.

## 2. *Promote Fact-Based Licensing and Patenting*

Previous Parts describe how volume patenting is intimately tied to the practice of volume licensing. During licensing negotiations, if one party is focused on the number, not the quality, of the other party's patents, it makes more sense for that party to acquire more low-quality rather than fewer high-quality patents. However, change the nature of licensing negotiations and the incentives for patenting will change as well. If other ways of measuring cross-coverage that do not rely primarily on the number of patents can be popularized, companies will have less of an incentive to "pad" their portfolios, since only those patents whose worth is proven will impact the negotiations. The best practices of companies or intermediaries who have developed such techniques should be publicized. The practice of "fact-based" rather than "volume" licensing could, in turn, effect a change in the way companies patent.

In addition to fact-based licensing, fact-based patenting may also cause companies to rethink their patenting strategies. In their influential article, Opperman and Tan challenged companies to take examine the long-term financial costs associated with volume-patenting, as compared to quality-patenting.<sup>349</sup> Their financial model suggests that, in the long run, volume-patenting costs more and provides less protection to companies' patent portfolios than does quality-patenting. Companies should analyze whether or not their patent portfolios are really serving the purposes for which they have been acquired. The data in this Article suggest that large portfolios do not always succeed at one of their main objectives—keeping companies out of court. These types of internal evaluations may lead companies to pare down their patent portfolios.

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348. *Id.*

349. Opperman & Tan, *supra* note 280.

### C. REDUCING PATENT HOLD-UP

In today's patent ecosystem, patents can no longer provide companies with freedom from hold-up. As a result, defensive strategies must be reconceptualized to include new tactics—including sharing information, prevention, disruption, and coordination—for securing freedom to operate.

#### 1. *Sharing Information*

As has been described earlier, patentees use secrecy to increase hold-up, a term that refers to inflation in the bargaining power of a patentee due to choices made by the accused prior to the time of bargaining. It would be socially desirable to increase transparency to reduce these imbalances. At a systemic level, creating mechanisms to more easily track who owns which patents would go towards reaching that goal. However, this represents a hard problem, given the wide variety of ways in which patentees refer to themselves, the limited incentives companies have to record their patent assignments in a timely manner,<sup>350</sup> and the large number of subsidiaries corporations have, all of which make it difficult to quantify a corporation's complete patent holdings with certainty. How these obstacles to transparency can be overcome is worth further consideration.

Privately, companies can “disarm” patent-assertion entities by sharing information about them with other targets. Information aggregator PatentFreedom has tried to do this by collecting information on the activities, techniques, and holdings of patent-assertion entities and splitting the cost among its members.<sup>351</sup> A “community module” allows members to share additional information about patent-assertion entities, to find other members with shared interests, and to explore opportunities for collaboration and mutual defense.<sup>352</sup> Others have called for the sharing of information via blogs and other free fora, such as was provided by the Patent Troll Tracker website.<sup>353</sup>

Perhaps information about licenses and settlements could be shared more broadly—for example through a clearinghouse that would sanitize and remove any company-specific information. Having more data points regarding license negotiations and license terms could help rationalize them, which would aid courts in reasonable royalty determinations. As Lemley and Myhrvold note in their more general proposal to require

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350. Recordation within three months provides rights against subsequent purchasers of a patent, but no other statutory benefits. 35 U.S.C. § 261 (2006).

351. *Research Methodology and Value Proposition*, PATENTFREEDOM, <https://www.patentfreedom.com/serviceofferings.html> (last visited Dec. 17, 2010).

352. *Optional Core Module*, PATENTFREEDOM, <https://www.patentfreedom.com/serviceofferings-ocm.html> (last visited Dec. 17, 2010).

353. Fawcett & Chan, *supra* note 121, at 7–18.

publication of patent assignments and license terms, disclosure of patent information will make it “harder for a few unscrupulous patent owners to hold-up legitimate innovators.”<sup>354</sup>

### 2. *Limiting Patent Sales*

As has been discussed, practicing corporations increasingly have incentives to sell their unused patents to the marketplace. While privately beneficial, these acts increase the risk that the patents will be used to hold up practicing companies. Because of this, some have called on companies “not [to] sell arms to terrorists,” that is, to exclude patent-assertion entities from their patent sales.<sup>355</sup> Patentees may attempt to do this by attaching strings to the patent assets released by companies into the market or by excluding patent-assertion entities from the buying pool.<sup>356</sup> However, in practice, controlling the downstream use of a patent is likely easier said than done. In addition, it is unrealistic to expect that companies will choose not to sell patents for the best price they can get for them merely on principle. Calls for companies to limit their sales could be accompanied by publicity that gives such companies public relations incentives not to engage in such sales.

A better solution might be to leverage the self-interest of patentees by creating alternatives to sale. One kernel of an idea is to create a nonprofit organization that would allow companies to donate their patents and to realize a tax benefit accordingly. The nonprofit could then license the patents non-exclusively to the public, thereby allowing the patents to be used defensively, but not offensively, or simply retire them. Law firms could be engaged to do “IP audits” to identify unused assets and to apply proven accounting approaches to patent valuations.

Another suggestion is to publicize the benefits of letting patents expire and how to identify good candidates for expiry. The cost savings from retiring patents can be substantial, reducing not only maintenance fees, but also the recordkeeping and administration needed to keep track of the patents, as well as the payments. Dow Chemical Company saved “millions of dollars annually by dropping non-strategic patents.”<sup>357</sup> Publicizing information about how to determine what patents to retire and the cost savings associated with retirement may lead companies to pare down their portfolios.

### 3. *Disruption*

There are several ways that a target can disrupt a patent-assertion entity’s campaign. One way is to call the patent’s validity into question by filing a request for inter partes reexamination. The effect of

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354. Lemley & Myhrvold, *supra* note 126, at 258.

355. Fawcett & Chan, *supra* note 121, at 19.

356. *Id.*

357. Oriel, *supra* note 197, at 94.



reexamination is to cloud the rights associated with the patent and, in some cases, to suspend litigation at the district court.<sup>358</sup> In 60% of the cases decided to date, the patent was canceled entirely,<sup>359</sup> as compared to a 33% rate of patent invalidation at district court.<sup>360</sup> In reexamination, the patent does not enjoy the presumption of validity it gets in litigation, contributing to this higher “kill rate.”<sup>361</sup> The patentee has had to change the claims in 35% of reexamination cases to date, and in only 5% of cases have the patents emerged unscathed by the reexamination.<sup>362</sup> However, the reexamination process is risky, effectively precluding the target from later attempting to invalidate the patent in court.<sup>363</sup> It is also lengthy, lasting on average 3.5 years without appeals and five-to-eight years with them.<sup>364</sup> If the reexamination does not lead to a stay of pending litigation, its value is greatly diminished. Even if it does, the same cloud of uncertainty that hangs over the patent hangs over the target.

If a threat letter is specific enough, a target can also initiate a declaratory judgment action.<sup>365</sup> By beating the patent-assertion entity to court, the target can pick the venue and the timing of the litigation. Filing a declaratory judgment action also calls the plaintiff’s “bluff,” potentially forcing a patent-assertion entity with limited resources to underwrite a litigation for which it did not plan.

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358. The likelihood of getting a stay varies from court to court. According to an analysis of recent published decisions, the Northern District of California granted stays 72% of the time (twenty-one out of twenty-nine stay requests) as compared to the Eastern District of Texas, which granted stays 46% of the time (eleven out of twenty-four stay requests). ThinkFire, *supra* note 112; *see also* Yar Chaikovsky, Presentation at the Advanced Patent Law Institute, Santa Clara: Reexamination and Litigation 23, 25 (Dec. 2009) (copy on file with the author).

359. U.S. PATENT AND TRADEMARK OFFICE, INTER PARTES REEXAMINATION FILING DATA (2009) [hereinafter INTER PARTES FILING DATA], available at [http://www.uspto.gov/web/patents/documents/inter\\_partes.pdf](http://www.uspto.gov/web/patents/documents/inter_partes.pdf).

360. Stephen B. Maebius & Leon Radomsky, *A Case for Strategic Use of Re-Examination*, LAW 360 (July 23, 2009), <http://www.law360.com/articles/112760> (copy on file with the Hastings Law Journal).

361. *See, e.g., In re Swanson*, 540 F.3d 1368, 1377 (Fed. Cir. 2008).

362. INTER PARTES FILING DATA, *supra* note 359.

363. Under 35 U.S.C. § 315(c) (2006),

A third-party requester whose request for an inter partes reexamination results in an order under section 313 is estopped from asserting at a later time, in any civil action arising in whole or in part under section 1338 of title 28, the invalidity of any claim finally determined to be valid and patentable on any ground which the third-party requester raised or could have raised during the inter partes reexamination proceedings.

364. RALPH ECKARDT & MARK BLAXILL, INST. FOR PROGRESS, REEXAMINING INTER PARTES REEXAM (2008).

365. Declaratory judgment jurisdiction in patent cases is governed by Article III of the Constitution, the Declaratory Judgment Act, and most recently, by *MedImmune v. Genentech*, 549 U.S. 118, 131 (2007) (holding that licensees do not have to breach their license before bringing declaratory judgment actions).

#### 4. *Coordinated Action*

One of the most important tactics for combating hold-up may be to join forces with other targets. There are several ways companies can do so, both generally and against specific threats. In the context of a lawsuit, for example, companies can band together by entering into joint defense agreements to invalidate a patent commonly asserted against them.<sup>366</sup> Companies can also share costs in initiating reexamination.

The knowledge of the broader technical and legal community can also be leveraged to find prior art to invalidate patents. Several organizations have sprung up to engage in such “crowd-sourcing.” Article One Partners, which describes itself as the “world’s largest patent research community,”<sup>367</sup> offers monetary rewards to people who submit the best prior art that affects a given patent.<sup>368</sup> The company makes money through clients who fund the studies, and through public stock trades using the information gathered.<sup>369</sup> The Electronic Frontier Foundation (“EFF”)’s “most wanted” list features “bogus software patents” that it describes as “annoying and often dangerous legal weapons.”<sup>370</sup> Related projects include PatentFizz,<sup>371</sup> Peer-to-Patent,<sup>372</sup> Peer-to-Patent post-issue,<sup>373</sup> and EFF’s own Patent Busting project.<sup>374</sup>

The key challenges to coordination-based action include differences in the parties’ positions or decisionmaking processes, “free-riding” by parties who benefit from but do not contribute to the action, and the time and costs required to agree on and to implement a coordinated strategy.<sup>375</sup> To effectively implement coordinated strategies, the parties need to “truly work together, not just when it is convenient for them to do so, but even when certain actions seem to contravene their own individual interests.”<sup>376</sup>

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366. For a general overview of such agreements, see Thomas G. Pasternak & David R. Donoghue, *Making Joint Defense Agreement Work*, LITIG., Summer 2008, at 26, 26.

367. ARTICLE ONE PARTNERS, <http://www.articleonepartners.com/> (last visited Dec. 17, 2010).

368. *How it Works, an Overview*, ARTICLE ONE PARTNERS, <http://www.articleonepartners.com/how-it-works/> (last visited Dec. 17, 2010).

369. Simon Owens, *How Crowdsourcing Could Revolutionize Patent-Busting*, MEDIASHIFT (Mar. 17, 2009), <http://www.pbs.org/mediashift/2009/03/how-crowdsourcing-could-revolutionize-patent-busting076.html>.

370. EFF: *The Patent Busting Project*, ELEC. FRONTIER FOUND., <http://w2.eff.org/patent/> (last visited Dec. 17, 2010).

371. PATENTFIZZ, <http://patentfizz.com> (last visited Dec. 17, 2010).

372. PEER TO PATENT, <http://peertopatent.org> (last visited Dec. 17, 2010); see also Andy Oram, *Peer-to-Patent and Article One Drag the Reclusive Patent Onto the Thoroughfare*, O'REILLY CMTY. (Jan. 30, 2009), <http://broadcast.oreilly.com/2009/01/peer-to-patent-and-article-one.html>.

373. POST ISSUE PEER-TO-PATENT, <http://www.post-issue.org> (last visited Dec. 17, 2010).

374. See *supra* note 370.

375. PATENT LENS, <http://www.patentlens.net/daisy/patentlens/patentlens.html> (last visited Dec. 17, 2010).

376. Fawcett & Chan, *supra* note 121, at 19.

## CONCLUSION

The patent environment has become significantly more complex in recent years. From relative obscurity, patent-assertion entities have become some of the patent system's most active litigants. More and more patents are being bought and sold on the secondary market for patents, shifting emphasis from the patent "arms race" to the patent marketplace. Companies are taking advantage of the new opportunities the market presents. All of these developments have led to the creation of a more complex, heterogeneous patent ecosystem.

An understanding of this new complex patent ecosystem represents a critical insight into the process of determining how best to fix the crisis in which many perceive the patent system currently to be.<sup>377</sup> Without this context, proposed changes to the system by Congress, the USPTO, and the courts are unlikely to be successful and may backfire or lead to unintended consequences. The specific findings in this Article regarding how and how not to change the patent system are informed by the description of the new patent ecosystem provided above. As policymakers consider these and related proposals, they should consider the new realities of the patent ecosystem and, more broadly, the opportunities and threats they present to innovation.

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377. For example, three of the most important titles about the patent system of the past decade have indicated the extent to which the patent system needs fixing. *See generally* JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK* (2008); BURK & LEMLEY, *supra* note 12; ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT* (2004).

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