

TROLLS OR MARKET-MAKERS? AN EMPIRICAL ANALYSIS OF NONPRACTICING ENTITIES

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NPEs (NPEs) are firms that rarely or never practice their patents, and instead focus on earning licensing fees. NPEs may have patented inventions on their own or bought the patents from other inventors. NPEs have been the subject of much controversy over the past few years. Critics of these firms have labeled them “patent trolls” and claim that they use weak and vague patents to extract excessive licensing fees or to engage in frivolous infringement litigation against product manufacturers. NPEs and their supporters, on the other hand, claim that these firms enhance innovation and competition by providing capital to independent inventors and creating an efficient market for trade in technological information. This Note uses patent data from the U.S. Patent and Trademark Office (PTO) and infringement litigation information from Stanford Law School’s Intellectual Property Litigation Clearinghouse (IPLC) to test some of the arguments made for and against NPEs and to determine whether these firms benefit or harm innovation.

INTRODUCTION

In 2001, NTP, Inc., a small Virginia based company, sued Research in Motion (RIM), the maker of the popular BlackBerry device, for infringement of five patents related to email technology.¹ The patents in question were granted to Thomas J. Campana, a cofounder of NTP, but the company had never practiced the patents prior to the lawsuit.² The district court held that RIM had infringed the patents, ordered the company to pay \$53.7 million in damages, and granted NTP a permanent injunction, stayed pending appeal, which could have forced RIM to shut down its BlackBerry email service.³ Although RIM appealed the case to the United States Court of Appeals for the Federal Circuit and also challenged the validity of the patents at the U.S. Patent and Trademark Office (PTO), its attempts were ultimately unsuccessful.⁴ Faced with possible destruction of its business due to the injunction, RIM settled the litiga-

1. See Complaint at 2, *NTP, Inc. v. Research in Motion, Ltd.*, 261 F. Supp. 2d 423 (E.D. Va. 2002) (No. 3:01CV767); Michelle Kessler, High Court Refuses to Hear BlackBerry-Maker Case, *USA Today*, Jan. 24, 2006, at 1A.

2. See Teresa Riordan, Patents; A Canadian Company Appeals in Court for the Right to Keep Selling Blackberries in the U.S., *N.Y. Times*, June 7, 2004, at C2 (“NTP does not make anything [from the patents].”).

3. *NTP, Inc. v. Research in Motion, Ltd.*, No. 3:01CV767, 2003 U.S. Dist. LEXIS 26837, at *1–*3, *5 (E.D. Va. Aug. 5, 2003).

4. See *NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282, 1325–26 (Fed. Cir. 2005) (affirming in part, reversing in part, and remanding the case back to the district court); *NTP, Inc. v. Research in Motion, Ltd.*, 397 F. Supp. 2d 785, 786–89 (E.D. Va. 2005) (describing RIM’s efforts to challenge validity of NTP patents before the PTO and refusing to stay remand proceedings pending PTO reexamination).

tion in March 2006 and agreed to pay NTP \$612.5 million in exchange for licensing rights to the latter's patents.⁵

The blockbuster settlement ignited a firestorm of criticism against NTP and added fuel to an already bitter debate about the role of non-practicing entities (NPEs) like NTP.⁶ NPEs are firms that rarely or never practice their patents, instead focusing on earning licensing fees. NPEs may have patented these inventions on their own or may have bought the patents from other inventors.⁷ Critics have labeled NPEs "patent trolls" and claim that they use weak and vague patents to threaten product manufacturers and extract excessive licensing fees or engage in frivolous infringement litigation.⁸ On the other hand, these firms and their supporters claim that NPEs enhance innovation and competition by providing

5. Yuki Noguchi, Patent Dispute Is Settled, *Wash. Post*, Mar. 4, 2006, at A1.

6. See, e.g., Ian Austen & Lisa Guernsey, A Payday for Patents 'R' Us, *N.Y. Times*, May 2, 2005, at C1 (describing criticism of small patent holding companies); William M. Bulkeley, Aggressive Patent Litigants Pose Growing Threat to Big Business, *Wall St. J.*, Sept. 14, 2005, at A1 (same). The tone of the criticism was also unusually vituperative, with one commentator comparing NPEs to "patent system bottom feeders." Patent Quality Improvement, Hearing Before the Subcomm. on Courts, the Internet, & Intellectual Prop. of the H. Comm. on the Judiciary, 108th Cong. 21 (2003) [hereinafter Patent Quality Hearings] (statement of David M. Simon, Chief Patent Counsel, Intel Corp.). Another commentator referred to NPEs as the "mold that eventually grows on rotten meat." Tim Wu, Weapons of Business Destruction: How a Tiny Little "Patent Troll" Got BlackBerry in a Headlock, *Slate*, Feb. 6, 2006, at <http://slate.msn.com/id/2135559/> (on file with the *Columbia Law Review*).

7. See FTC, To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy, ch. 2, at 31 (2003), available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf> (on file with the *Columbia Law Review*) [hereinafter FTC, Innovation Report] ("[NPEs] may be design firms that patent their inventions but do not practice them or patent assertion firms that buy patents from other companies . . .").

8. See, e.g., Robin M. Davis, Note, Failed Attempts to Dwarf the Patent Trolls: Permanent Injunctions in Patent Infringement Cases Under the Proposed Patent Reform Act of 2005 and *eBay v. Mercexchange*, 17 *Cornell J.L. & Pub. Pol'y* 431, 438 (2008) ("Most patent trolling behavior thrives on the inequities of enforcing patent rights without contributing anything to either the invention or production of new technologies."); Jason Kirby, Patent Troll or Producer?, *Fin. Post*, Jan. 14, 2006, available at <http://www.financialpost.com/story.html?id=1509d361-0144-4432-b6dc-2c14026c98d6> (on file with the *Columbia Law Review*) ("Companies who do the costly grunt work of actually developing and marketing new technologies are being held ransom by tiny outfits whose only assets are 'kooky and vague' patents . . ."); Joe Beyers, Rise of the Patent Trolls, *CNET News.com*, Oct. 12, 2005, at http://news.cnet.com/Rise-of-the-patent-trolls/2010-1071_3-5892996.html (on file with the *Columbia Law Review*) ("[Patent Trolls] seek to quietly acquire significant patent portfolios with the intent of threatening lengthy and costly patent infringement lawsuits against operating companies."); Maggie Shiels, Technology Industry Hits Out at 'Patent Trolls,' *BBC News*, June 2, 2004, at <http://news.bbc.co.uk/1/hi/business/3722509.stm> (on file with the *Columbia Law Review*) ("An added problem is the growth of so called 'patent trolls' who can be likened to modern day highway robbers . . .").

capital to independent inventors and creating an efficient market for trade in technological information.⁹

Concern about NPEs has also elicited strong reactions from the judiciary and Congress. In a decision widely interpreted as designed to curb the alleged abuses perpetrated by NPEs, the U.S. Supreme Court cast aside twenty years of Federal Circuit precedent on infringement remedies and set new guidelines for the grant of injunctive relief.¹⁰ Congress has also displayed concern about the role of NPEs and is currently considering several patent reform bills¹¹ that, if enacted, would lead to the biggest changes in the U.S. patent system since the Patent Act of 1952.¹² These reform efforts have been accompanied by an intense debate among academics about the benefits and drawbacks of NPEs.¹³ Critics and supporters have outlined various ways in which NPEs can harm or promote innovation, but their arguments are for the most part theoretical and

9. See, e.g., Spencer Hosie, *Patent Trolls and the New Tort Reform: A Practitioner's Perspective*, 4 I/S: J.L. & Pol'y for Info. Soc'y, 75, 78–86 (2008) (challenging “myths” about patent trolling); James F. McDonough III, *The Myth of the Patent Troll: An Alternative View of the Function of Patent Dealers in an Idea Economy*, 56 Emory L.J. 189, 190 (2006) (“Patent trolls provide liquidity, market clearing, and increased efficiency to the patent markets—the same benefits securities dealers supply capital markets.”); Marc Morgan, *Stop Looking Under the Bridge for Imaginary Creatures: A Comment Examining Who Really Deserves the Title Patent Troll*, 17 Fed. Cir. B.J. 165, 165 (2008) (“Many legitimate businesses play a positive role by encouraging innovation, increasing liquidity, and providing market clearing.”).

10. See *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006); see also Steve Seidenberg, *Troll Control: The Supreme Court's eBay Decision Sets Back Pesky 'Patent Trolls' or American Innovation, Depending Upon Which Side You're On*, A.B.A. J., Sept. 2006, at 51, 52 (discussing ramifications of the *eBay* case).

11. See Patent Reform Act of 2006, S. 3818, 109th Cong. (2006); Patents Depend on Quality Act of 2006, H.R. 5096, 109th Cong. (2006); Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005); see also *infra* Part I.C (discussing proposed legislative reform of U.S. patent system).

12. See McDonough, *supra* note 9, at 195 (describing Patent Reform Act of 2005 as “the most substantial legislative reform to the patent system since 1952”).

13. See, e.g., Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 Tex. L. Rev. 1991, 1993 (2007) [hereinafter Lemley & Shapiro, *Patent Holdup*] (describing burden of holdup and royalty stacking problems that NPEs impose on manufacturers); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in *1 Innovation Policy and the Economy* 119, 125 (Adam B. Jaffe et al. eds., 2001) [hereinafter Shapiro, *Patent Thicket*] (noting burden on manufacturers from improperly granted patents). But see Vincenzo Denicolò et al., *Revisiting Injunctive Relief: Interpreting eBay in High-Tech Industries with Non-Practicing Patent Holders*, 4 J. Competition L. & Econ. 571, 575 (2008) (“[T]he post-*eBay* case law seems to be leaning towards a one-sided approach that favors a manufacturing licensee's point of view with little consideration given to the impact on firms with other kinds of legitimate business models, such as innovators with limited or no presence in downstream markets . . .”); John M. Golden, “Patent Trolls” and Patent Remedies, 85 Tex. L. Rev. 2111, 2116 (2007) (questioning conclusion of Lemley & Shapiro, *supra*, that NPEs impose excessive burdens on downstream manufacturers). For further discussion on the pros and cons of NPEs, see articles cited in *supra* notes 8 and 9.

supported only by anecdotal evidence.¹⁴ Given the far-reaching implications of patent reform proposals, and the important role the NPE debate plays in shaping those reforms, it is crucial to test arguments made for and against NPEs and examine whether they accurately reflect events occurring in the real world.¹⁵

An empirical study of NPE patenting and litigation behavior can provide some useful insights into the role played by NPEs in the innovation economy and present a valuable complement to the theoretical debate. Patent data from the PTO and infringement litigation information from Stanford Law School's Intellectual Property Litigation Clearinghouse (IPLC) offer a wealth of information that can be used to analyze NPE behavior and determine whether these firms are as useful or harmful as their advocates or detractors claim. An empirical analysis of patent and litigation data cannot provide a definitive answer about the benefits and drawbacks of NPEs, but it can serve as a helpful starting point for policy-makers weighing the arguments made by opposing sides of the NPE debate.

This Note attempts to provide a supplement to the debate regarding NPEs by conducting a wide-ranging empirical analysis of the patenting and litigation behavior of fifty-one firms that do not practice their patents.¹⁶ The analysis contained in this Note not only tests some of the arguments made for and against NPEs but also provides some clues to answering the central question: Do NPEs benefit or harm innovation? It does so by first examining the "value" or "importance" of patents owned by NPEs using variables such as the number of times a patent is cited or the technical breadth of a patent, which have been considered by scholars as indicative of patent value.¹⁷ The Note compares the value-indicative measures for a sample of litigated NPE patents and a set of randomly

14. See, e.g., the scholarly articles cited in *supra* notes 8 and 9. Professors Lemley and Shapiro have presented some empirical evidence to support their theory of holdup and royalty stacking. See Lemley & Shapiro, Patent Holdup, *supra* note 13, at 2025–35 (discussing selected case studies of royalty stacking in different industries and studying reported court decisions awarding reasonable royalties as damages for patent infringement).

15. For example, Justice Kennedy relied heavily on the FTC, Innovation Report, *supra* note 7, in his concurrence in *eBay*. *eBay*, 547 U.S. at 396 (Kennedy, J., concurring).

16. For details on how these firms were selected, see Appendix B. This Note focuses on commercial firms that rarely or never practice any patents because they are the most controversial and have borne the brunt of the criticism of troll-like behavior. The analysis in this Note ignores independent inventors and universities, even though these two groups also frequently do not practice their patents, because they have largely been in the periphery of the "troll" debate. See, e.g., Ashley Chuang, Note, Fixing the Failures of Software Patent Protection: Detering Patent Trolling by Applying Industry-Specific Patentability Standards, 16 S. Cal. Interdisc. L.J. 215, 218–19 (2006) ("[U]niversities and other research institutions should not be considered patent trolls simply because they license their technology."). But see Mark A. Lemley, Are Universities Patent Trolls?, 18 Fordham Intell. Prop. Media & Ent. L.J. 611, 615–19 (2008) (discussing perception of universities as patent trolls).

17. See *infra* Part II.A.2.

selected litigated patents as well as a subgroup of litigated patents that share the same technical classifications as the NPE patents.¹⁸ The Note then turns to an analysis of the litigation behavior of NPEs and examines the success rate of these firms to determine whether they engage in frivolous litigation.¹⁹

The results from this analysis of NPE patents and their litigation behavior provide a generally favorable picture of NPEs. These firms own patents that are of significantly higher value or importance than other litigated patents.²⁰ NPE patents also rank higher than the litigated patents that share the same technological class in every value measure employed in the analysis.²¹ Finally, the study of NPE litigation behavior shows that the success rate of NPEs in patent infringement litigation is quite similar to that of other litigants.²²

The analysis contained in this Note is admittedly limited because it focuses on a sample of litigated patents owned by a small number of NPEs. The results from even this limited analysis, however, provide some interesting evidence about the role of NPEs in the innovation economy. This Note's findings tend to disprove allegations of abusive litigation by NPEs, and suggest that NPEs may in fact play an important role in the innovation economy by acting as intermediaries between promising independent inventors and users of technology. The results also imply that policymakers should exercise caution before creating laws that hinder the ability of NPEs to effectively perform their role in fostering innovation. In particular, the analysis in this Note suggests that courts should not give undue weight to the nonpracticing status of patent infringement plaintiffs while ruling on injunction motions, and that lawmakers should not allow the rhetoric of "patent trolls" to shape future reforms of the U.S. patent system.

The remainder of the Note is organized as follows: Part I provides an overview of the debate about NPEs and examines arguments made by critics and supporters of NPEs. It then analyzes the judicial and legislative responses to the alleged problems caused by NPEs. Part II outlines a two-part empirical analysis of NPE patents and litigation. Part III presents results suggesting that concerns about abusive litigation by NPEs are overstated and that these firms can in fact enhance innovation by providing capital and resources to the most promising independent inventors and small businesses.

18. See *infra* Part II.A.2.

19. See *infra* Part II.B.

20. See *infra* Part III.B.

21. See *infra* part III.B.

22. See *infra* Part III.C.

I. THE NPE DEBATE

This Part provides an overview of the contentious debate regarding the role of NPEs in the innovation economy and examines the judicial and legislative action spurred by concern about NPEs. Part I.A summarizes the main arguments of critics and supporters of NPEs and examines weaknesses in the claims emerging from both camps. Part I.B analyzes the 2006 decision by the U.S. Supreme Court in *eBay Inc. v. MercExchange, L.L.C.*²³ and discusses its impact on NPEs. Finally, Part I.C describes the patent reform bills currently before Congress and analyzes the potential costs and benefits of these bills in relation to NPEs, and also the U.S. patent system as a whole.

A. *Trolls or Market-Makers? Two Views on NPEs and Innovation*

1. *What Critics Say About NPEs.* — Opponents of NPEs claim that these firms are detrimental to innovation because they a) engage in frivolous litigation; b) increase the cost of products by charging manufacturers licensing fees; and c) exacerbate the patent thicket problem. This section examines each of these claims in turn and explains their strengths and weaknesses.

a. *NPEs Use Weak Patents to Engage in Frivolous Litigation.* — One of the most prominent criticisms against NPEs is that they acquire weak and obscure patents and use them to pursue “baseless” litigation.²⁴ Critics contend that meritless infringement lawsuits brought by NPEs not only overwhelm the legal system but also drive up costs by requiring product manufacturers to expend precious time and resources defending infringement claims.²⁵ Furthermore, they argue that by driving up business costs of target companies through bad faith litigation, NPEs increase the cost of goods because their target companies pass on the increased costs to consumers.²⁶ As evidence, they point to statements by companies that

23. 547 U.S. 388 (2006).

24. See Chuang, *supra* note 16, at 232 (“Because of a patent troll’s approach to generating revenue, a troll’s charges of infringement and litigation can often be baseless and thus clog the legal system.” (citation omitted)); see also Hosie, *supra* note 9, at 78 (“Perhaps the most common refrain in the patent debate is that plaintiffs will bring frivolous cases to extort unjustified settlements.”); Kirby, *supra* note 8 (“Critics argue that patent trolls, or patent holders who threaten companies with costly court battles unless they’re offered licensing fees, are a serious threat to legitimate businesses.”); Beyers, *supra* note 8 (“[Patent trolls] seek to quietly acquire significant patent portfolios with the intent of threatening lengthy and costly patent infringement lawsuits against operating companies.”).

25. Chuang, *supra* note 16, at 234 (“For many companies, dealing with patent trolls is simply a business expense that drives up costs by diverting time and resources away from business development.” (citation omitted)).

26. *Id.* at 235 (arguing NPE lawsuits result in a “hidden tax” on software products); Davis, *supra* note 8, at 438 (noting patent trolls “drive up the price of new consumer technology because manufacturing corporations . . . often pass the costs of royalty payments and patent litigation along to consumers”).

have had to defend against lawsuits brought by NPEs.²⁷ For example, Jay Monahan, the deputy general counsel of eBay, was quoted as saying:

[NPE lawsuits have] driven eBay's costs up, and [they divert] time and resources from building the world's greatest e-commerce platform. There are dollars spent on lawyers[,] . . . [t]here's also an impact on diverting in-house legal staff, engineers, people at all levels to produce documents and sit for depositions. Our approach to this point has been to vigorously defend ourselves against these claims and not to pay ransom money if you will.²⁸

The cost of litigating a patent infringement claim is an unfortunate but unavoidable feature of a system that rewards inventors with a limited property right over their creation. The crux of the critics' argument is that NPEs initiate costly lawsuits even if the underlying claim is without merit. But this claim seems questionable on at least two grounds. First, on average, plaintiffs require about \$2 million to mount an infringement suit.²⁹ Given the enormous cost of litigating infringement suits, it is doubtful whether a rational NPE, or a contingency fee attorney, would sue a defendant if there was a low probability of a positive outcome.³⁰ Second, it is unclear whether NPE-initiated suits are indeed significant enough to have an impact on the costs of most products. The fifty-one firms studied in this Note, for example, were only responsible for about two to three percent of patent infringement lawsuits filed each year between 2000 and 2008.³¹ Other estimates of NPE-initiated litigation range from two to twelve percent of all patent infringement litigation in the United States.³² A recent, more comprehensive study, also based on data

27. See, e.g., Elizabeth D. Ferrill, Patent Investment Trusts: Let's Build a PIT to Catch the Patent Trolls, 6 N.C. J.L. & Tech. 367, 377 (2005) ("For eBay, dealing with the patent troll incidents . . . has driven up its costs . . .").

28. Shiels, *supra* note 8.

29. John R. Allison, Mark A. Lemley, Kimberly A. Moore, & R. Derek Trunkey, Valuable Patents, 92 Geo. L.J. 435, 441 (2004) ("Total direct litigation costs for the median patent case with between \$1 million and \$25 million at stake were \$2 million per side in 2003.").

30. See Hosie, *supra* note 9, at 80 ("No sane plaintiff's lawyer would spend this kind of money on a frivolous case . . . Frivolous cases simply do not pay." (emphasis omitted)). Of course, the NPE might bet that the defendant will choose to settle quickly even if it doubts the merits of the infringement claim to avoid the cost of drawn out litigation. On the other hand, an NPE seeking to sell licenses to an extensive portfolio of patents will probably not be able to play the "sue and see" game because manufacturers are unlikely to repeatedly pay money to make the claims go away. Moreover, defendants may take an aggressive approach to defending against all the claims so as to discourage meritless claims in the future. See text accompanying *supra* note 28 (stating intention of defendant to vigorously defend against claims).

31. See *infra* Part III.C, Table 3 (showing number of NPE lawsuits as percent of total infringement lawsuits by year).

32. See Nathan Myhrvold, Inventors Have Rights, Too!, Wall St. J., Mar. 30, 2006, at A14 ("Court records show that only 2% of all patent lawsuits are due to plaintiffs that have no ongoing product business. Of that 2%, the vast majority are perfectly legitimate companies or universities. A tiny minority of patent suits are due to bad actors, but it's

from Stanford's IPLC, found that NPEs initiated about seventeen percent of patent infringement suits between January 1, 2000 and March 21, 2008.³³ In contrast, companies that practiced their patents accounted for seventy-six percent of infringement suits.³⁴ These estimates show that NPE lawsuits comprise a relatively small percentage of all infringement litigation, and it is therefore doubtful whether NPE litigation causes any significant increase in the costs faced by businesses in the country. Finally, a tally of the outcomes of NPE-initiated litigation, presented in Part III.C of this Note, shows that the win rates of NPEs does not differ significantly from that of infringement plaintiffs in general.³⁵ This suggests that claims of "baseless" NPE litigation should be viewed with some skepticism.

b. *NPEs Drive Up the Cost of Products by Extracting High Licensing Fees from Manufacturers.* — Another frequently levied charge against NPEs is that they raise the price of goods by extracting high licensing fees from product manufacturers.³⁶ Critics point to cases like *NTP, Inc.*, and claim that the high royalty fees and post-trial settlements paid out to NPEs impose huge costs on manufacturers who pass on that cost to consumers in the form of higher prices.³⁷ This argument, however, simply echoes arguments against the patent system as a whole. The U.S. patent system seeks to reward inventors by providing them with a monopoly over their inven-

hardly a crisis."); Gwendolyn G. Ball & Jay P. Kesan, *Transaction Costs and Trolls: Individual Inventors, Small Firms and Entrepreneurs in Patent Litigation 24* (2008) (Ill. Pub. Law Working Paper, No. 08-21, 2008), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1337166 (on file with the *Columbia Law Review*) (reporting NPEs initiated about two percent—forty-nine cases out of a total of 2,486—of all infringement suits between 2000 and 2002); Patent Freedom, *Current Research: Litigations Over Time*, at <https://www.patentfreedom.com/research-lot.html> (last visited Sept. 30, 2009) (on file with the *Columbia Law Review*) (reporting NPEs initiated about twelve percent of all infringement suits in 2008).

33. Colleen V. Chien, *Of Trolls, Davids, Goliaths, and Kings: Narratives and Evidence in the Litigation of High-Tech Patents*, 87 N.C. L. Rev. 1571, 1572, 1600 (2009).

34. *Id.* at 1600.

35. See *infra* Part III.C, Table 5 (comparing success rate of NPEs and plaintiffs from random sample).

36. See, e.g., FTC, *Innovation Report*, *supra* note 7, ch. 3, at 40 ("Commentators have also observed that companies seeking to hold up rivals can set the licensing fees below the cost of litigation, including the managerial distraction, so as to make the taking of a license the only economically sensible alternative, regardless of the strength of the patent."); Davis, *supra* note 8, at 438 ("[Patent trolls'] licensing practices drive up the price of new consumer technology because manufacturing corporations forced to take licenses on a troll's patents often pass the costs of royalty payments and patent litigation along to consumers.").

37. See, e.g., Lemley & Shapiro, *Patent Holdup*, *supra* note 13, at 1993 ("[T]he threat of an injunction can enable a patent holder to negotiate royalties far in excess of the patent holder's true economic contribution. Such royalty overcharges act as a tax on new products incorporating the patented technology, thereby impeding rather than promoting innovation."); Chuang, *supra* note 16, at 235 ("[E]nd users of software products are subjected to a hidden tax on software technology of companies that have been targeted by patent trolls.").

tion for a limited time.³⁸ Therefore, patents typically have all the efficiency-reducing characteristics of monopolies.³⁹ In theory, it should not make a difference whether the patent over a particular invention is owned by an NPE or a vertically integrated firm, i.e., a firm that both conducts research and development and manufactures products, because the latter is likely to charge a profit-maximizing monopolist price that is higher than the ideal welfare-maximizing price.⁴⁰

Some scholars have noted that NPEs pose a special danger when they sue a manufacturer for infringement after the latter has already “sunk” investments into developing and marketing the allegedly infringing product.⁴¹ Faced with the prospect of losing all its investments because of an injunction, the manufacturer may agree to pay a high licensing fee and then pass on the cost to consumers in the form of higher prices.⁴² NPEs are more likely to engage in such strategic behavior than vertically integrated firms because unlike the latter, an NPE does not exploit its own invention and create a product.⁴³ The firm that manufactures products based on its patented technology can earn profits from the products it creates from its inventions. Such a firm, therefore, has fewer incentives than an NPE to wait for another manufacturer to infringe its patents and

38. U.S. Const. art. I, § 8, cl. 8 (granting Congress power to “promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries”).

39. See Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 *J. Legal Stud.* 247, 248 (1994) (“[S]ince patent law gives the patentee the power to exclude others from practicing the invention, a monopoly may be created, leading to restriction of production, a supracompetitive price, and what economists call an efficiency or deadweight loss.”).

40. See *id.* at 250 (discussing “economic rents” received by patentee when it creates product based on its patent).

41. See Lemley & Shapiro, *Patent Holdup*, *supra* note 13, at 2009 (noting potential revenue from patent infringement litigation has “enticed a number of firms into the business, not of innovating, but of buying patents and suing to enforce them”); Shapiro, *Patent Thicket*, *supra* note 13, at 125 (discussing danger of infringement litigation in context of the “holdup” problem).

42. See Lemley & Shapiro, *Patent Holdup*, *supra* note 13, at 1993 (“[R]oyalty overcharges act as a tax on new products incorporating the patented technology, thereby impeding rather than promoting innovation.”). The authors cite the BlackBerry case as an example of this effect. *Id.* at 2009. It is important to note, however, that royalty payments to NPEs will not always raise the prices of the affected products. For example, in a competitive product market, the manufacturer may be hesitant to raise prices for fear of losing market share. In this case, there would simply be a shift of surplus from the manufacturer to the NPE and consumers would be unaffected.

43. See Daniel J. McFeely, *An Argument for Restricting the Patent Rights of Those Who Misuse the U.S. Patent System to Earn Money Through Litigation*, 40 *Ariz. St. L.J.* 289, 297 (2008) (“In many cases, patent trolls operate as intellectual property or patent holding companies, purposefully acquiring patents for which they then seek to find infringers.”).

then bring a lawsuit.⁴⁴ Additionally, even when another party is infringing its patents, a vertically integrated firm may be less likely to behave strategically for fear of retaliation. This is because some of the firm's own products may be vulnerable to infringement suits.⁴⁵ The problem of the "stranded" manufacturer could be avoided if the manufacturer conducted a "patent clearance" before sinking substantial resources into developing and marketing a product.⁴⁶ Such patent clearances, however, can be tremendously costly and time consuming because products such as microprocessors and cell phones "can easily be covered by dozens or even hundreds of different patents."⁴⁷

Nevertheless, one cannot simply infer that NPEs are blackmailing manufacturers by charging allegedly "exorbitant" licensing fees without first examining the value of the underlying patent.⁴⁸ In fact, NPEs may be demanding the seemingly high licensing fees because they own the foundational patents that made the products possible in the first place.⁴⁹ Consider for example, Alexander Graham Bell's patent on telephony. Suppose that Bell himself was uninterested in practicing his invention but simply wanted to earn royalties from his patent. A company seeking to provide telephone services would need to license the technology from

44. The problem of the stranded manufacturer can occur even without a deliberate "wait and see" approach to patent licensing by the NPE. It might be that the NPE noticed the infringement only after the manufacturer introduced a product in the market.

45. For discussion of "mutually assured destruction," see *infra* notes 56–57 and accompanying text

46. See Miranda Jones, *Permanent Injunction, A Remedy by Any Other Name Is Patently Not the Same: How eBay v. MercExchange Affects the Patent Right of Non-Practicing Entities*, 14 *Geo. Mason L. Rev.* 1035, 1052 (2007) ("[O]ne of the most accessible strategies to protect against infringing on a patent is a meticulous patent clearance."). Jones proposes that companies perform a "patent clearance" process similar to the title clearance process used in real estate transactions. *Id.*

47. Lemley & Shapiro, *Patent Holdup*, *supra* note 13, at 1992.

48. See, e.g., Eric E. Bensen & Danielle M. White, *Using Apportionment to Rein in the Georgia-Pacific Factors*, 9 *Colum. Sci. & Tech. L. Rev.* 1, 1–3 (2008) (noting reasonable royalties should reflect "value contributed by the patent"); Carl Shapiro, *Injunctions, Hold-Up, and Patent Royalties* 9 (Aug. 2006) (unpublished manuscript, on file with the *Columbia Law Review*), available at <http://faculty.haas.berkeley.edu/shapiro/royalties.pdf> [hereinafter Shapiro, *Injunctions*] (using value of patented technology along with patent strength and bargaining power of patentee to calculate benchmark royalty rate that "represents a reasonable reward to the patent holder for its patented technology").

49. See Anne Layne-Farrar et al., *Pricing Patents for Licensing in Standard Setting Organisations: Making Sense of FRAND Commitments* 3 (CEPR Discussion Paper No. 6025, 2007), available at <http://ssrn.com/abstract=996700> (on file with the *Columbia Law Review*). The authors use two economic models to build a benchmark for calculating royalty payments in standard setting organizations (SSOs). See *id.* at 4 (using Efficient Component-Pricing Rule (ECPR) and Shapley value as benchmarks for calculating fair, reasonable, and non-discriminatory royalties). They conclude that patents covering "essential" technologies that do not have close substitutes should receive higher royalty payments relative to other patents within a given standard. *Id.* at 31–32. Although the authors focus on royalties within SSOs, the implications of their research are also valid in determining royalty rates outside of an SSO setting.

Bell. Now suppose that five years later, another inventor develops a method for improving the sound quality of telephone conversations. If the later inventor also seeks to license her patent to telephone service providers, she may not be able to negotiate a fee comparable to what Bell is paid.⁵⁰ The mere fact that Bell charges a higher licensing fee than the subsequent inventor does not mean that he is blackmailing the telephone service providers.⁵¹ Similarly, NPEs may be earning high licensing fees because they own pioneering patents and not because they are exploiting stranded manufacturers. Therefore, examining the value of patents owned by NPEs can clarify whether the licensing revenues earned by NPEs are exploitative, or simply reflective of the value of their patents. That NPEs own valuable patents does not rule out the possibility of opportunistic behavior on their part, but it does provide some justification for their royalty demands.

c. *NPEs Exacerbate the Patent Thickets Problem.* — Some scholars argue that the U.S. patent system has created a world of fragmented rights and led to “patent thickets.” Carl Shapiro defines a thicket as a “dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology.”⁵² Shapiro argues that patent thickets not only raise the transaction costs associated with assembling the intellectual property rights for a given product but also lead to royalty stacking—the phenomenon in which disparate owners of complementary technologies license their patents at their profit-maximizing monopoly price and cause a cumulative reduction in welfare.⁵³ To illustrate this problem, imagine a situation in which ten different firms each own a patent required for making a widget.⁵⁴ Assuming that these firms act rationally, each firm will charge a profit-maximizing licensing fee for its patent. The cumulative effect of this behavior is an increase in the price of the widget, which reduces demand, and causes a welfare loss. In contrast, if a single firm owned all ten patents, then it would

50. To be sure, this is a simplified example that ignores complexities such as the relative bargaining power of the parties and the state of the telecommunications industry over time. Nevertheless, it helps illustrate the point that royalty payments depend on the value of the underlying invention, a notion that is well established in U.S. patent law. See *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*, 235 U.S. 641, 648 (1915) (noting “the nature of the invention, its utility and advantages, and the extent of the use” should be considered when calculating reasonable royalties).

51. See *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) (listing “[t]he portion of the realizable profit that should be credited to the invention” as one of the factors to consider while calculating reasonable royalties for a given patent).

52. Shapiro, *Patent Thicket*, *supra* note 13, at 120.

53. FTC, *Innovation Report*, *supra* note 7, ch. 2, at 32.

54. Since a widget manufacturer requires rights to all ten patents in order to make the widget, the ten patents are perfect complements of each other. See Damien Geradin et al., *The Complements Problem Within Standard Setting: Assessing the Evidence on Royalty Stacking*, 14 *B.U. J. Sci. & Tech. L.* 144, 146 (2008) (discussing situation in which patents are perfect or “strict” complements).

maximize its total profits by charging a single monopoly price for all ten patents, thus avoiding the problem of cumulative monopoly rent.⁵⁵ In short, fragmented rights over a particular technology can raise prices, lower demand, and cause a net welfare reduction.⁵⁶

The thickets problem itself is not NPE-specific: It makes little difference in theory whether the complementary patents are controlled by practicing or nonpracticing entities. Consider, however, the situation of two competing manufacturers who each hold complementary patents. Since each firm can threaten the other with an infringement suit, the two have an incentive to cooperate with each other and cross-license each others' patents at minimal or zero cost. The alternative would be "mutually assured destruction"—if one firm sues for infringement, the other will retaliate and also sue for infringement.⁵⁷ But, in a situation where a manufacturer and an NPE control the complementary patents, there is no pressure on the NPE to reach a cross-licensing agreement because it does not create any products based on the patents. Therefore, the NPE will insist on a licensing fee and will be able to negotiate without risk of a retaliatory infringement suit by the manufacturer.⁵⁸ This failure to negotiate a cross-licensing agreement could lead to higher prices for the end product as explained above.⁵⁹

As numerous commentators have pointed out, the thickets problem arises from the flood of patents that are granted by the PTO each year.⁶⁰ The thousands of patents issued by the PTO do not all represent important technical breakthroughs. Most of them are in fact trivial inventions that do not significantly contribute to the storehouse of public knowledge.⁶¹ The proliferation of trivial patents leads to fragmented ownership rights, which in turn gives rise to the complements problem. In a world without complementary patents, NPEs would not pose a greater

55. FTC, Innovation Report, *supra* note 7, ch. 2, at 32 ("[I]f a single firm controlled the production of all complementary inputs, it would extract a single monopoly rent, and the price would be lower than the aggregate of individual monopoly prices."). The royalty stacking problem is a version of the famous complements problem first identified by Augustin Cournot. See Augustin Cournot, *Researches into the Mathematical Principles of the Theory of Wealth* 99–116 (Nathaniel Bacon trans., Macmillan 1929) (1838) (exploring influence of "mutual relations" between producers on costs and profits).

56. FTC, Innovation Report, *supra* note 7, ch. 2, at 32.

57. *Id.* at 30–31 & n.222.

58. *Id.* at 31.

59. See *supra* text accompanying notes 53–56.

60. See FTC, Innovation Report, *supra* note 7, ch. 3, at 34–35 (discussing large numbers of patents and attributing thicket problem to "ease of obtaining patents at the PTO"); Shapiro, Patent Thicket, *supra* note 13, at 125 ("[M]anufacturers can potentially infringe on hundreds of patents with a single product.").

61. See FTC, Innovation Report, *supra* note 7, ch. 3, at 36 ("[T]he standard for obviousness should be increased so as to prevent 'very trivial inventions' being patented by the PTO." (citation omitted)).

threat to welfare maximization than a practicing entity.⁶² Of course, NPEs can exacerbate the problem by failing to engage in mitigation behavior such as cross-licensing agreements. The underlying problem, however, is caused by the issuance of patents on trivial variations of the same invention, and not the NPE business model.

Moreover, an increase in cross-licensing agreements can also perversely exacerbate the thickets problem. In their analysis of patenting in the semiconductor industry, Professors Hall and Ziedonis conclude that large vertically integrated firms were “harvesting” more patents from their research and development both as a defensive strategy (to protect their own field of invention and manufacture) and to increase their bargaining power in cross-licensing arrangements.⁶³ When a firm is in the process of developing a product, it will want to guard against potential infringement suits by obtaining a rash of patents related to the product to assert in its defense. Therefore, obtaining patents solely for defensive reasons causes a rise in patenting of incremental inventions and leads to a thicket.⁶⁴ Also, the ability of a firm to cross-license depends on the breadth and depth of its own patent portfolio.⁶⁵ In order to enter into a cross-licensing agreement, the firm has to ensure that it has a large patent portfolio; otherwise it will be unable to enter into agreements with other firms with large portfolios.⁶⁶ Both defensive patenting and the desire to enter into cross-licensing arrangement can therefore encourage firms to obtain more patents and thereby exacerbate the thickets problem. In contrast, NPEs do not have the incentives to engage in defensive patenting or cross-licensing agreements because they do not make products that could infringe other patents. Consequently, while NPEs may not be amenable to mitigation measures, they are also not the primary cause of the thickets problem. Thus, policymakers should exercise caution before condemning NPEs due to the thickets problem, especially in light of their benefits discussed in the next section.

2. *What Supporters Say About NPEs.*

a. *NPEs Provide Capital and Bargaining Power to Independent Inventors and Small Businesses.* — An independent inventor does not realize any financial gains simply by obtaining a patent. She has to either develop a

62. See McDonough, *supra* note 9, at 202 (“[A]nyone wielding a bad patent can abuse the patent system . . .”).

63. 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, 108–09 (2001); see also Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 *U. Pa. L. Rev.* 1, 26–28 (2005) (describing how firms amass portfolios of patents to improve their defensive position).

64. See FTC, *Innovation Report*, *supra* note 7, ch. 2, at 25–26 (explaining how “defensive patenting strategies can drive firms to patent even more”).

65. See Hall & Ziedonis, *supra* note 63, at 109–10 (“[A] firm lacking a strong patent portfolio of its own with which to negotiate licensing or cross-licensing agreements could face a more rapid erosion of profits . . .”).

66. *Id.*

product and commercialize it or license the patent to a third party. Independent inventors are often at a disadvantage for accomplishing either of the two because they lack the necessary resources to develop and market a product or enter into prolonged licensing negotiations.⁶⁷ Even if the inventor were to try to license her patent on her own, she would be unlikely to obtain a licensing fee that an NPE could obtain during negotiations because the latter brings a key ingredient to the bargaining table: a credible litigation threat.⁶⁸ If an independent inventor were to negotiate with the manufacturer on her own, the manufacturer may offer the inventor a paltry sum because the inventor is unlikely to have the resources to mount a serious infringement lawsuit.⁶⁹ An NPE, however, has the capital and other resources to litigate, thereby forcing the manufacturer to offer better terms which would be reflected in any payment made to the inventor.⁷⁰ By rewarding independent inventors in this manner, NPEs encourage them to engage in further inventive activity.

67. A comprehensive study of independent inventors found that “the probability of commercialization for inventions developed by independent inventors is only between 1/8 to 1/4 of that which is expected for inventions developed in established firms.” Thomas Åstebro, *Basic Statistics on the Success Rate and Profits for Individual Inventors*, 23 *Entrepreneurship Theory & Prac.* 41, 43 (1998); see also McDonough, *supra* note 9, at 208 (contrasting individual patent grantees’ lingering need to monetize patent with firm’s profit maximizing and cost minimizing strategies in patent acquisition); Kirby, *supra* note 8 (describing unsuccessful efforts of Paul Ware, an independent inventor of high-tech identification cards, to license his patent on his own).

68. See McDonough, *supra* note 9, at 212 (“Unlike the individual inventor who poses no real litigation threat, the patent dealer has ample funds with which to litigate.”); Morgan, *supra* note 9, at 173–74 (“Inventors maximize efficiency by focusing on inventing and allowing other parties to deal with enforcement or licensing of patents. Indeed, many inventors find enforcement or licensing of patents to be distracting, time consuming, and costly.”). See generally Jeff A. Ronspies, Comment, *Does David Need a New Sling? Small Entities Face a Costly Barrier to Patent Protection*, 4 *J. Marshall Rev. Intell. Prop. L.* 184, 195–96 (2004) (discussing disadvantages faced by independent inventors and small businesses under current patent law). Of course, some independent inventors do enforce their patents on their own. See Chien, *supra* note 33, at 1600 (reporting five percent of patent infringement lawsuits between 2000 and 2008 were filed by independent inventors).

69. An average infringement lawsuit is estimated to cost about \$2 million for each side. See Allison et al., *supra* note 29, at 441.

70. See, e.g., McDonough, *supra* note 9, at 212 (describing how an NPE may be able to extract higher licensing fees than an independent inventor); Kirby, *supra* note 8 (quoting Paul Ware, an independent inventor, as saying “Acacia [an NPE] has been my saviour Many patents have referenced my patent, but I couldn’t afford to litigate. Without [Acacia], it would have been infringed on by all these big companies”). In a study of patenting in the software industry, Allison, Dunn, and Mann outline the various obstacles faced by independent inventors in commercializing their inventions. John R. Allison, Abe Dunn & Ronald J. Mann, *Software Patents, Incumbents, and Entry*, 85 *Tex. L. Rev.* 1579, 1614–16 (2007). The software industry is characterized by network effects that make it difficult for an inventor to launch a successful product, for example, a web browser, on her own. Thus, an independent inventor often has to license her technology to incumbent software companies. *Id.* at 1614. The independent inventor also is unlikely to have the financial and legal knowledge to successfully negotiate with the incumbent company. *Id.* at 1615. Moreover, independent inventors will likely lack the long standing

In fact, NPEs have played such a role throughout history. A study of inventive activity in the United States in the early nineteenth century found that the rise in trade of patent rights caused an increase in specialization and productivity among independent inventors.⁷¹ By selling the rights to their invention, the inventors could focus their “attention and resources on the pursuit of inventive activity” instead of spending time and energy on trying to commercialize their invention.⁷² The authors of the study conclude that the growth of a market for technological information was “an important contributor to the achievement of a high level of specialization at invention well before the rise of large-scale research laboratories in the twentieth century.”⁷³ Modern day NPEs may be performing the same useful function performed by the patent dealers of the early nineteenth century.

Furthermore, researchers have found that the value of patents owned by independent inventors is highly variable—some patents are very valuable while others are of very little value.⁷⁴ NPEs can therefore perform an important function by sifting through the patents owned by independent inventors and identifying the most valuable ones. By repeatedly analyzing and buying patents, NPEs become experts at differentiating between valuable and trivial patents and rewarding the inventors accordingly.⁷⁵ In a market without NPEs, it would be more difficult to identify the valuable and trivial patents owned by independent inventors and, as a result, technology buyers would be unwilling to pay a high price for a patent because of the fear that it will turn out to be of low value. Likewise, independent inventors who own valuable patents will be unwilling to sell their patents at such a low price.⁷⁶ This sort of information asymmetry will drive owners of high value patents from the marketplace altogether. Thus, promising independent inventors will be unable to

relationships with incumbent firms that venture-backed software firms enjoy. *Id.* The authors argue that this scenario creates the perfect setting for litigation intermediaries, such as the firms discussed in this Note, to emerge to provide the capital and legal and financial competencies required to negotiate licensing arrangements or to litigate infringement claims. *Id.* at 1617.

71. Naomi R. Lamoreaux & Kenneth L. Sokoloff, Long-Term Change in the Organization of Inventive Activity, 93 *Proc. Nat'l Acad. Sci.* 12,686, 12,689 (1996).

72. *Id.*

73. *Id.* at 12,686.

74. Kristina Dahlin et al., Today's Edisons or Weekend Hobbyists: Technical Merit and Success of Inventions by Independent Inventors, 33 *Res. Pol'y* 1167, 1175–77 (2004).

75. See McDonough, *supra* note 9, at 214 (noting patent dealers can reduce information asymmetry by investing “time, money, and effort [to learn] what is available where for how much” (internal quotation marks omitted) (quoting John McMillan, *Reinventing the Bazaar: A Natural History of Markets* 44 (2002))).

76. This is a version of the “lemons” problem discussed in George A. Akerloff, *The Market for “Lemons”: Quality Uncertainty and the Market Mechanism*, 84 *Q.J. Econ.* 488 (1970). This seminal article outlined how information asymmetries in the used car market can drive away sellers of high quality used cars and leave behind a marketplace populated by lemons. Such information asymmetries can lead to a similar problem in the patent licensing market.

monetize their inventions and will lack the resources to engage in further inventive activities. NPEs are well positioned to solve this informational asymmetry by performing valuable due diligence. NPEs could therefore identify and reward promising independent inventors and encourage them to make other discoveries. In this way, NPEs can enhance innovation.

Despite all the benefits that NPEs can bestow on independent inventors, there is also a possibility that these firms might behave opportunistically and exploit independent inventors. For example, an inventor may agree to sell her patent to an NPE for a small sum of money without realizing the true value of her invention. Indeed, some commentators have pointed out that these firms sometimes purchase patents from struggling small businesses at a bargain price and then use those patents to extract large licensing revenues.⁷⁷ Critics of NPEs also argue that by buying and enforcing patents that had previously been unenforced by their inventors, these firms may reduce social welfare.⁷⁸ If the inventor did not realize the value of her patent or that it was being infringed by a given product, then society was essentially enjoying the technology covered by that patent for free. When an NPE begins to enforce the patent and demand royalties, the price of the product covered by the patent is likely to increase, and this could reduce demand and cause a deadweight loss.⁷⁹ Thus, by enforcing property rights that had been passed on to the public domain by default, NPEs can have an efficiency-reducing effect.⁸⁰ It is important to keep in mind, however, that by rewarding inventors who otherwise would have failed to realize any gains from their patents, NPEs could encourage further invention by both those inventors and other similarly-situated independent inventors, which would lead to an increase in social welfare.⁸¹ This latter effect could balance or surpass any

77. See McFeely, *supra* note 43, at 294 (recounting how TechSearch, an NPE, purchased patent for \$50,000 at bankruptcy sale and filed \$500 million patent infringement suit against Intel for infringing patent). The problem of opportunistic behavior by NPEs, however, can often be solved contractually. For example, the independent inventor could ask for a percentage of any royalties earned by the NPE from her patent.

78. See James R. Farrand, *Territoriality and Incentives Under the Patent Laws: Overreaching Harms U.S. Economic and Technological Interests*, 21 *Berkeley Tech. L.J.* 1215, 1286–90 (2006) (discussing harm resulting from enforcement of “unused or ‘quiescent’ patents” by “patent trolls”).

79. As noted *supra* note 42, however, royalty payments to NPEs will not always lead to an increase in the price of the underlying product.

80. See Farrand, *supra* note 78, at 1286–90 (discussing tendency of “trolls [to] exploit the weaknesses of the U.S. patent system against entities that are performing the hard work of innovation”).

81. See McDonough, *supra* note 9, at 222–24 (discussing ways in which NPEs “promote the Progress of . . . useful Arts”). In addition to providing incentives to independent inventors that they fund directly by buying patents, NPEs may also encourage other independent inventors to innovate and obtain patents in the hope of eventually selling them to NPEs.

reduction in social welfare that results from enforcement of dormant patents.⁸²

b. *NPEs Create an Efficient Market for Patents.* — Supporters also argue that NPEs help create an efficient market for patents by making them more liquid and by performing a market-clearing function.⁸³ As mentioned in the previous section, obtaining a patent does not yield financial dividends by itself. The patentee has to either commercialize a product based on her invention or license the patent to a product manufacturer who may be interested in the invention. NPEs provide the patentee with a third option: She can sell her patent rights to an NPE in return for cash. Therefore, NPEs increase the liquidity of patents and make them more marketable.

NPE advocates such as James McDonough have also argued that NPEs can transform the patent market from a “search market,” with multiple buyers and sellers, into a centralized market with intermediaries.⁸⁴ They analogize NPEs to the dealers at NASDAQ who match investors with companies requiring capital. A manufacturer searching for new technology does not have to investigate thousands of inventors. Instead it can just contact an NPE specializing in that technology.⁸⁵ In a related point, McDonough also claims that NPEs reduce information asymmetries that exist between buyers and sellers of patents.⁸⁶ While patent sellers and buyers may not be aware of the underlying worth of patents, by undertaking repeat transactions and by studying the technology and the scope and breadth of the patent, an NPE can set a market-clearing price for the particular patent.⁸⁷ Therefore, NPEs can also perform a role similar to investment analysts who research stocks in particular industries. By making patents liquid and reducing information asymmetries between buyers and sellers of patents, NPEs help create an efficient market for patents.⁸⁸

On the other hand, this rosy-eyed view of the market-making role of NPEs glosses over the possibility that NPEs will exploit market imperfec-

82. See Dam, *supra* note 39, at 252 (“The expansion of output and the reduction in price achieved through technological progress resulting from research and development may be quite remarkable, far beyond any possible social loss from rent seeking.”).

83. See, e.g., McDonough, *supra* note 9, at 213–18.

84. *Id.* at 213; Morgan, *supra* note 9, at 174; see also Mike Langberg, Lots of Patents for Sale, But Few Bids, San Jose Mercury News, Apr. 7, 2006, at 1D (describing current system of buying and selling patents through loose network of brokers and lawyers as “inefficient and expensive”).

85. The market intermediary analogy is not completely apposite, however, because NPEs do more than just perform due diligence—they risk their own capital and buy patents, not with the view of selling them in a secondary market, but to earn licensing revenues. NPEs, therefore, also function in many ways like shareholders who buy stocks at an exchange to earn dividends.

86. McDonough, *supra* note 9, at 214–15.

87. *Id.*

88. See *id.* at 215–16 (describing NPEs as better able to clear market by reducing information asymmetries and noting improved efficiency resulting from market clearing and increased liquidity).

tions to benefit themselves and not the buyers and sellers of patents. The existence of asymmetric information regarding the value of patents may allow NPEs to set prices that are too low while buying patents from inventors and then subsequently licensing them for a hefty fee.⁸⁹ This problem is likely to abate over time as buyers and sellers of patents become savvier about pricing intellectual property assets.⁹⁰ But even though NPEs may lead to a more efficient patent market in the long run, there is a possibility that these firms are engaging in strategic behavior in the short run.

This section reviewed the debate about the role of NPEs in the innovation economy. NPE critics have pointed out several plausible ways in which these firms are detrimental to innovation but their view may be overly pessimistic. Similarly, NPE supporters have put forward numerous ways in which NPEs may benefit innovation but have ignored their potential to cause serious short-term damage. As the NPE debate has progressed, the general perception that has developed in the past few years is that on balance, NPEs have been detrimental to innovation.⁹¹ Indeed, concern about NPEs has prompted legislative and judicial actions that have far-reaching implications for innovation in the country. Part I.B analyzes the Supreme Court's decision in *eBay v. MercExchange*⁹² and its impact on NPEs and on patent remedies in general. Part I.C examines bills that are currently before Congress and the ways in which they propose to counter the influence of NPEs.

B. *The Judicial Response*

The U.S. Supreme Court decided to weigh in on the NPE debate when it granted certiorari in *eBay v. MercExchange* in 2005.⁹³ The plaintiff in *eBay*, a small Virginia-based company called MercExchange, claimed that the "Buy It Now" feature used in the bidding website and its sister website half.com infringed its three patents related to fixed price online

89. See, e.g., Davis, *supra* note 8, at 438 ("Patent trolls drive down the fair market value of intellectual property when they buy patents of specious value sight-unseen.").

90. See McDonough, *supra* note 9, at 218–19 (noting "the emergence of patent dealers evinces a natural progression of the patent market" towards the efficient securities and exchange market model).

91. *Id.* at 189 (describing criticism of NPEs by mainstream media); see also Chien, *supra* note 33, at 1574 ("Since the term was coined in 1991, trolls, or NPEs, have become perhaps the most controversial and least popular group of patent plaintiffs." (citation omitted)); Hosie, *supra* note 9, at 76 ("[T]he existence and attributes of patent trolls have become articles of faith, the enduring stuff of urban legend."); Ronald S. Katz, Shawn G. Hansen & Omair Farooqui, Patent Trolls: A Selective Etymology, *IP Law* 360, at 1, Mar. 20, 2008, available at http://www.manatt.com/uploadedFiles/News_and_Events/Articles_By_Us/patentroll.pdf (on file with the *Columbia Law Review*) ("[T]he epithet [patent troll] is now commonly bandied about in courts and the halls of Congress.").

92. *eBay Inc. v. MercExchange*, L.L.C., 547 U.S. 388 (2006).

93. *eBay Inc. v. MercExchange*, L.L.C., 546 U.S. 1029 (2005).

sales.⁹⁴ After a five week trial, the jury held that eBay and half.com willfully infringed MercExchange's patents and awarded \$35 million in damages.⁹⁵ The district court, however, denied MercExchange's request for a permanent injunction by noting that

the plaintiff's willingness to license its patents, its lack of commercial activity in practicing the patents, and its comments to the media as to its intent with respect to enforcement of its patent rights, are sufficient to rebut the presumption that it will suffer irreparable harm if an injunction does not issue.⁹⁶

On appeal, the Court of Appeals for the Federal Circuit reversed the district court's denial of a permanent injunction, noting that because the "right to exclude recognized in a patent is but the essence of the concept of property," the general rule is that a permanent injunction will issue once infringement and validity have been adjudged.⁹⁷

The U.S. Supreme Court vacated the judgment of the Federal Circuit and emphasized that the four factor test, used by courts to evaluate permanent injunctions generally, applied with equal force to patent infringement cases.⁹⁸ Writing for the Court, Justice Thomas said that the Federal Circuit erred by creating a special rule of automatic injunctions for patent cases.⁹⁹ The Court held that a patent holder seeking a permanent injunction against infringement must satisfy the traditional four factor test, i.e., demonstrate

(1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction.¹⁰⁰

In a concurring opinion, Chief Justice Roberts (joined by Justices Ginsburg and Scalia) noted that the grant of monetary damages rather than an injunction hardly vindicates a patent owner's right to exclude and suggested that use of the four factor test would not lead to significantly different results than the Federal Circuit's automatic injunction rule.¹⁰¹ In contrast, Justice Kennedy's concurring opinion (joined by

94. First Amended Complaint at 12–14, *MercExchange, L.L.C. v. eBay, Inc.* (*MercExchange I*), 275 F. Supp. 2d 695, 696 (E.D. Va. 2003) (No. 261-CV-736).

95. *eBay Settles Patent Dispute Over 'Buy It Now' Feature*, N.Y. Times, Feb. 29, 2008, at C3.

96. *MercExchange I*, 275 F. Supp. 2d at 712.

97. *MercExchange, L.L.C. v. eBay, Inc.* (*MercExchange II*), 401 F.3d 1323, 1338 (Fed. Cir. 2005) (quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1246–47 (Fed. Cir. 1989)).

98. *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 394 (2006).

99. *Id.* at 393–94 ("Just as the District Court erred in its categorical denial of injunctive relief, the Court of Appeals erred in its categorical grant of such relief.").

100. *Id.* at 391.

101. *Id.* at 394–95 (Roberts, C.J., concurring) ("From at least the early 19th century, courts have granted injunctive relief upon a finding of infringement in the vast majority of

Justices Breyer, Souter, and Stevens) seemed to view the four factor test as a significant departure from the Federal Circuit's rule.¹⁰² Justice Kennedy highlighted two concerns about the grant of automatic injunctions. First, Justice Kennedy observed, “[w]hen the patented invention is but a small component of the product the companies seek to produce . . . legal damages may well be sufficient to compensate for the infringement and an injunction may not serve the public interest.”¹⁰³ Second, he noted:

[A]n 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.¹⁰⁴

Justice Kennedy's observation about patents that cover only minor elements of the finished products is essentially a variation of the “patent thickets” argument discussed supra Part I.A.1.c. As noted in that section, thickets can pose a serious problem to manufacturers trying to assemble the rights to make a single product.¹⁰⁵ But it is important to disentangle the thickets concern from the question of whether the patent owner practices her invention. Denial of injunction because the patent covers a minor part of the infringing product may be a sensible approach because most commentators agree that the owner of a patent that covers only a small portion of the infringing product should not be allowed to shut down production of the product altogether.¹⁰⁶ Denying the injunction for infringement of a patent simply because the patent owner does not practice her invention, however, may be more costly.¹⁰⁷

patent cases. This ‘long tradition of equity practice’ is not surprising, given the difficulty of protecting a right to *exclude* through monetary remedies that allow an infringer to *use* an invention against the patentee's wishes—a difficulty that often implicates the first two factors of the traditional four-factor test.”).

102. *Id.* at 395–97 (Kennedy, J., concurring).

103. *Id.* at 396–97.

104. *Id.* at 396 (internal citation omitted).

105. See supra text accompanying notes 53–58.

106. See FTC, Innovation Report, supra note 7, ch. 2, at 28–29 (discussing ways holdup by patent owner can harm innovation and competition); Denicolò et al., supra note 13, at 584 (“[A]bolishing injunctive relief altogether would be justified only if . . . patent holders are systematically over-rewarded.”); Lemley & Shapiro, Patent Holdup, supra note 13, at 2009 (“[Information technology] companies are paying holdup money to avoid the threat of infringement. That is not a legitimate part of the value of a patent; it is a windfall to the patent owner that comes at the expense not of unscrupulous copyists but of legitimate companies doing their own R&D.”).

107. See Denicolò et al., supra note 13, at 583, 588 (“Categorically denying injunctions to non-manufacturing patent holders . . . casts far too wide a net, increasing the likelihood of false positives [i.e., the risk of denying an injunction to a patent holder in the absence of a significant holdup problem].”); Jones, supra note 46, at 1070 (“To erode the patent rights of NPEs in this way will also erode the patent rights of all who choose to sell their patents to NPEs, including individual inventors, universities, and corporations. The only value a patent has to any entity is that derived from enforcement.”).

As Part III.B of this Note demonstrates, NPEs own patents that cover valuable technologies, and denying them injunctive relief because of their nonpracticing status could interfere with their ability to identify and reward independent inventors. Therefore, diluting the standards for injunctions in this manner is likely to disproportionately hurt small businesses and independent inventors.¹⁰⁸ Without the threat of an injunction, smaller entities may not be able to bargain for fair licensing fees. Without the fear of losing any sunk costs due to an injunction, a manufacturer may be inclined to offer an NPE a low licensing fee and hope that it will accept the fee rather than sue for infringement.¹⁰⁹ More importantly, absent an injunction, the only remedy available to an NPE that proves validity and infringement is court-ordered damages, which are notoriously difficult to calculate¹¹⁰ and may well undercompensate the patent owner.¹¹¹

The full implications of the *eBay* ruling on NPEs are not quite clear because lower courts have not applied the four factor test in a large enough number of patent cases. The early post-*eBay* trend, however,

108. Patent Trolls: Fact or Fiction?, Hearing Before The Subcomm. on Courts, the Internet, & Intellectual Prop. of the H. Comm. on the Judiciary, 109th Cong. 12–13 (2006) [hereinafter Patent Trolls Hearing] (testimony of Dean Kamen, President, Dekka Research & Development Corporation) (“[W]hen I walk into that big company they’ve got marketing, they’ve got distribution, they’ve got everything. . . . [T]he only thing that I have on my side of the table is that patent [and the ability to say that] . . . you exclusively will have the right for some period of time.”).

109. William R. Everding, “Heads-I-Win, Tails-You-Lose”: The Predicament Legitimate Small Entities Face Post *eBay* and the Essential Role of Willful Infringement in the Four-Factor Permanent Injunction Analysis, 41 J. Marshall L. Rev. 189, 210 (2007) (arguing that after *eBay*, “[l]egitimate small entities will be forced to either cut their losses by surrendering their patented technology or risk having infringers drown them in high litigation costs”).

110. See Golden, *supra* note 13, at 2150–51 (“[B]oth courts and commentators have remarked that the determination of a reasonable royalty ‘seem[s] often to involve more the talents of a conjurer than those of a judge.’ Expert witnesses from opposing sides of a patent case frequently differ hugely in their estimates of reasonable royalties.” (citation omitted)). Professor Golden further argues:

The difficulty of assessing a reasonable royalty has in fact been one of the principal rationales for granting permanent injunctions. Commentators as well as courts have tended to conclude that property rules enforced by permanent injunctions generally make sense where a unique set of rights that are difficult to value is threatened with continued infringement. Because the courts are unlikely to do a good job at determining damages in such a context, conventional analysis has suggested that absent special circumstances, private parties should be left to assign the value of such rights through contract.

Id. at 2152 (footnote omitted).

111. See Denicolò et al., *supra* note 13, at 577–79 (demonstrating how court-ordered royalties can undercompensate patent owners). Inadequate court royalties not only undercompensate the patent owner with regard to the particular infringement, but will also adversely affect the patent owner’s future licensing negotiations. *Id.* at 603 (“[I]f a court sets a rate too low, it will not only cost the patent holder in that one transaction but will hinder the firm’s future negotiations with other potential licensees, as no other party will pay more than the publicly noted court rate.”).

does raise concerns for NPEs. District courts in an increasing number of cases have refused to issue injunctions when the patent owner did not practice the invention.¹¹² For example, in *z4 Technologies v. Microsoft*, the district court refused the plaintiff's motion for an injunction in part because it could not prove that it would suffer "irreparable harm" without the injunction.¹¹³ The district court noted that the plaintiff sought to license its invention to other companies and did not itself make products that would be harmed by competition from the infringing product.¹¹⁴ The court also dismissed the argument that the plaintiff's inability to get an injunction against Microsoft would harm its ability to negotiate licensing arrangements with other technology users.¹¹⁵ The patent at issue in *z4 Technologies* covered only a small portion of Microsoft Office and the court also cited that as a factor weighing against an injunction.¹¹⁶ Nevertheless, the language in cases such as *z4 Technologies* suggests that NPEs will face significant hurdles in obtaining injunctions even if their patents cover a substantial part of the infringing products because of the requirement to prove harm from market competition.¹¹⁷

In the aftermath of *eBay*, the outlook for NPEs seems grim. Application of the four factor test in a manner that weighs the nonpracticing status of the patent owner to deny an injunction will severely hamper the bargaining position of NPEs that seek to license patented technology to manufacturers, and consequently will affect their ability to serve as a source of capital and resources to independent inventors. This scenario may not be worrisome if NPEs are simply buying weak patents from inventors at a bargain price and then asserting them against manufacturers to earn big licensing fees. On the other hand, if NPEs are able to identify valuable patents and reward the inventors accordingly, then curtailing their ability to buy and sell patented technology may be detrimental to

112. See John L. Dauer, Jr. & Sarah Elizabeth Cleffi, Trends in Injunctive Relief in Patent Cases Post-*eBay*, Metropolitan Corp. Couns., Feb. 2007, at 16 ("To date, district courts appear to have thus far heeded Justice Kennedy's warnings in his *eBay* concurrence and not issued injunctions to [NPEs]."); Joseph Scott Miller, Injunction, Fire of Genius, at <http://www.thefireofgenius.com/injunctions/> (last updated December 31, 2007) (on file with the *Columbia Law Review*) (tracking, in wake of *eBay*, instances when district courts denied or granted injunctions in patent infringement cases).

113. *z4 Techs., Inc., v. Microsoft Corp.*, 434 F. Supp. 2d 437 (E.D. Tex. 2006).

114. *Id.* at 440.

115. *Id.* ("There is no logical reason that a potential consumer or licensee of *z4*'s technology would have been dissuaded from purchasing or licensing *z4*'s product activation technology for use in its own software due to Microsoft's infringement.").

116. *Id.*

117. See, e.g., *Paice L.L.C. v. Toyota Motor Corp.*, No. 2:04-CV-211-DF, 2006 WL 2385139, at *4 (E.D. Tex. Aug. 16, 2006) (denying NPE's request for permanent injunction due to lack of proof of irreparable harm), *aff'd*, 504 F.3d 1293 (Fed. Cir. 2007); see also Benjamin H. Diessel, Note, Trolling for Trolls: The Pitfalls of the Emerging Market Competition Requirement for Permanent Injunctions in Patent Cases Post-*eBay*, 106 Mich. L. Rev. 305, 311, 321 (2007) ("The requirement of market competition to obtain an injunction has been remarkably consistent [in the first twenty-five patent cases applying the four factor test].").

inventive activity in the country. Therefore, an analysis of the value of patents owned by NPEs is important in ascertaining the costs and benefits of the approach outlined in cases such as *z4 Technologies*. Such an analysis will shed light on the role NPEs play in the innovation economy and help inform the discussion of whether the rethinking of the standards for injunctive relief by the *eBay* court was justified.

C. *The Legislative Response*

Opponents of NPEs have also been actively lobbying Congress to curb their ability to threaten product manufacturers.¹¹⁸ In the past three years, several bills seeking to implement wide-ranging changes to the U.S. patent system have been introduced in Congress.¹¹⁹ In 2007, the ranking members of the House and Senate Judiciary Committees, both Democratic and Republican, collaborated to introduce a bicameral bill that consolidated provisions of earlier reform bills and proposed wide-ranging changes to the current U.S. patent system.¹²⁰ If enacted, the bill would, among other things (i) change the U.S. to a first to file instead of a first to invent system;¹²¹ (ii) specify a baseline for calculating infringement damages;¹²² (iii) raise the standard for finding willful infringement;¹²³ (iv) expand the use of post grant review;¹²⁴ and (v) roll back the limitations on third party pre-issuance protests.¹²⁵

The goal of the bill is to increase the quality of patents issued by the PTO and to curb the alleged litigation abuses that occur under the current system.¹²⁶ The bill clearly responds to the concerns raised about patent thickets and abusive NPE litigation. For example, section 4 states that courts should conduct an analysis to ensure that when infringement damages are being calculated based on a “reasonable royalty,” the damage award should reflect only the economic value of the patent’s “specific contribution over the prior art,” i.e., the truly new “thing” that the patent contributes to the overall product.¹²⁷ Thus, this provision ensures that the owner of a patent that covers only a minor component of the infring-

118. See Coal. for Patent Fairness, *Why Change Is Needed*, at <http://www.patentfairness.org/learn/why/> (last visited Sept. 22, 2009) (on file with the *Columbia Law Review*) (“New federal legislation is urgently needed to strengthen and to reform patent law in order to improve patent quality and to deter abuse of the system.”).

119. See Patent Reform Act of 2007, S. 1145, 110th Cong. (2007); Patent Reform Act of 2006, S. 3818, 109th Cong. (2006); Patents Depend on Quality Act of 2006, H.R. 5096, 109th Cong. (2006); Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005).

120. Sen. Patrick Leahy, Statement on Introduction of the Patent Reform Act of 2007 (Apr. 18, 2007), available at <http://leahy.senate.gov/press/200704/041807a.html> (on file with the *Columbia Law Review*).

121. S. 1145 § 2.

122. *Id.* § 4(c).

123. *Id.* § 4(e)(2).

124. *Id.* § 5.

125. *Id.* § 7.

126. Leahy, *supra* note 120.

127. S. 1145 § 4.

ing product is not overcompensated and eases the burden on manufacturers who create products that combine technology owned by disparate entities.¹²⁸

In addition, section 5 of the bill allows third parties to challenge the validity of a patent after it has been issued and, significantly, the challenged patent is not accorded the presumption of validity it would otherwise enjoy.¹²⁹ Similarly, section 7 allows third parties to provide information to the patent examiner that casts doubts on the patentability of the claimed invention during the examination process.¹³⁰ Together, these two provisions allow concerned third parties to play a crucial role in policing the quality of patents issued by the PTO both pre- and post-grant, and thereby curb the proliferation of trivial patents. These procedures also provide manufacturers with an attractive alternative to the costly and time-consuming route of obtaining a declaratory judgment of invalidity against questionable patents in a district court.¹³¹ Thus, these administrative opposition proceedings may not only diminish the thickets problem but also reduce the possibility of manufacturers being held hostage by owners of weak and questionable patents.¹³²

These third party review provisions, however, entail significant costs. First, allowing third parties to submit information to the patent examiner will prolong the already lengthy time it takes to examine and grant patents.¹³³ Since patents expire twenty years after the date the application was filed, a lengthy examination could shorten the life of a patent and

128. See Bensen & White, *supra* note 48, at 15–17 (discussing damage calculations for patents covering components).

129. S. 1145 § 5.

130. *Id.* § 7.

131. Section 5 of the Patent Reform Act of 2007 states that the PTO has to issue a final decision on patent validity within one year of the start of the proceedings. In contrast, according to the IPLC, it took on average 905 days, almost three years, for a patent infringement lawsuit to reach trial in the U.S. District Court for the Central District of California, the jurisdiction with the highest number of patent case filings between 2000 and 2008. Stanford IP Litigation Clearinghouse, Courts, at <http://lexmachina.stanford.edu/courts?filter=patent> (last visited Aug. 17, 2009) (on file with the *Columbia Law Review*); Stanford IP Litigation Clearinghouse, Estimated Time to Trial, at <http://lexmachina.stanford.edu/courts/cacd/Patent> (last visited Aug. 17, 2009) (on file with the *Columbia Law Review*).

132. FTC, Innovation Report, *supra* note 7, at 7 (recommending legislation creating new administrative procedure to allow post-grant review of and opposition to patents in order to address problem of “questionable patents”); see also *supra* notes 60–61 and accompanying text.

133. See David Popp et al., Time in Purgatory: Examining the Grant Lag for U.S. Patent Applications, 4 *Topics Econ. Analysis & Pol’y*, 1, 21 (2004) (finding mean grant lag of twenty-five months for U.S. patent applications and mean lag of more than forty-four months for biotech patent applications); Edward Walsh, Patent Office Seeks to Speed Applications, *Wash. Post*, June 4, 2002, at A15 (outlining series of changes intended to reduce time obtaining patents or trademarks).

decrease its value.¹³⁴ Moreover, given the rapid pace of today's technological evolution, long delays in patent examination can even render the patent obsolete.¹³⁵ Second, these procedures may be abused by companies to harass their competitors and to delay or prevent the latter from obtaining patents that are detrimental to their business.¹³⁶ The patent reform bill addresses this problem by providing for sanctions when these proceedings are improperly used to harass patentees,¹³⁷ but the exact nature of the sanctions is undefined and it is unclear whether these sanctions would have the appropriate deterrent effect. Finally, the costs of these procedures are most likely to be felt by independent inventors and small businesses because they are less likely to have the resources to defend their applications and patents in these actions.¹³⁸ Large corporations could use these proceedings to delay or block patents owned by smaller entities that challenge their businesses even if the patents represent significant technological breakthroughs. More troublingly, the time and cost associated with these proceedings may deter small business and independent inventors from patenting their inventions altogether.¹³⁹

134. 35 U.S.C. § 154(a)(2) (2006). The shorter patent life could benefit society as a whole by limiting the deadweight loss associated with the monopoly. It could also, however, harm inventors who may be unable to recoup the costs of their research and development efforts.

135. See Popp et al., *supra* note 133, at 2–3 (noting fear that long grant lag will provide greater opportunity for competitors to invent around patents).

136. See Patent Reform: The Future of American Innovation, Hearing before the S. Comm. on the Judiciary, 110th Cong. 16 (2007) (statement of Bruce G. Bernstein, Chief Intellectual Property and Licensing Officer, InterDigital Communications Corporation) (“[W]e have every reason to believe that large users of our technologies . . . would exploit the proposed post-grant opposition and expanded reexamination procedures to essentially tie up our patents through endless administrative and judicial challenges.”); Matthew Sag & Kurt Rohde, Patent Reform and Differential Impact, 8 *Minn. J.L. Sci. & Tech.* 1, 77 (2007) (“[A] badly structured system of post-grant review may also allow potential infringers to harass patent owners whose patents are not so suspect.”).

137. Patent Reform Act of 2007, S. 1145, 110th Cong. § 5(c)(1) (2007).

138. See, e.g., The Importance of Patent Reform on Small Business: Hearing Before the H. Comm. on Small Business, 110th Cong. 26 (2007) (statement of John Neis, Managing Director, Venture Investors) (“The post-grant review clearly favors large companies with deep pockets, who could use these proceedings to delay patent issuances to a venture-backed company.”); Christopher L. Logan, Patent Reform 2005: H.R. 2795 and the Road to Post-Grant Oppositions, 74 *UMKC L. Rev.* 975, 994 (2006) (“[T]he lower cost of opposition proceedings compared to litigation, combined with fewer protections against harassment than reexaminations, is sure to increase validity challenges. Unfortunately, small firms are likely to receive the brunt of such challenges.”); Erica Werner, Small-Time Inventors Take on Congress, Associated Press, Oct. 21, 2005, available at LexisNexis, AP File (describing strenuous opposition of small inventors to Patent Reform Act).

139. See Logan, *supra* note 138, at 997 (“The proposed post-grant opposition system, while possibly improving patent quality, would have a decided adverse impact on innovation [by independent inventors].”). Society will be deprived of disclosure of valuable technical knowledge if independent inventors and small firms practice their inventions as trade secrets rather than obtaining a patent.

Thus, while the goal of the patent reform bill is laudable, some of its provisions may be quite problematic and have already provoked fierce opposition.¹⁴⁰ Ironically, even though the rhetoric of the “patent troll” has figured prominently in lobbying efforts for the patent bill,¹⁴¹ it is unclear whether the bill will have much impact on NPEs in the first place.¹⁴² Certainly, the limitations on infringement damages will curb the ability of NPEs to earn windfall damages, but other provisions such as the pre- and post-grant third party challenges will have minimal impact on NPEs because these firms typically buy patents from their original owners, and the latter will most likely bear the burdens of these proceedings. To the extent that proponents are using the rhetoric about patent trolls to build support for the bill, however, it is important to test their arguments. Parts II.B and II.C of this Note outline an empirical analysis of NPE patenting and litigation behavior that will allow us to determine whether NPEs are in fact using weak and vague patents to engage in alleged litigation abuses. The results of the analysis will provide some clues about the credence and emphasis that should be given to this argument while legislators weigh the merits of the patent reform bill.

II. THE EMPIRICAL ANALYSIS

Despite the amount of attention garnered by the debate on NPEs, there has been almost no empirical study of these firms. The dearth of empirical research is especially surprising in light of the broad legislative and judicial measures that have been proposed to counter the perceived problem of NPEs.¹⁴³ This section presents a two-part empirical analysis of some of the claims made by critics of NPEs. In particular, the analysis will focus on the value or importance of patents owned by NPEs and their litigation success rate. This two-part analysis will directly test assertions that NPEs use weak and vague patents to threaten manufacturers with abusive infringement lawsuits. The results of this analysis will also help answer the central question about whether NPEs help or harm innova-

140. See Tom Abate, *Tech Titans, Biotech Firms Wrangle Over Patent Reform*, S.F. Chron., Feb. 5, 2008, at C1 (“Biotech industry leaders feel particularly threatened by proposed changes [contained in the Patent Reform Act.]”); Steven Pearlstein, *What Smartphone Makers Can Teach Legislators*, Wash. Post, June 11, 2008, at D1 (noting biotech and pharmaceutical companies have used “their considerable political influence to block the Senate . . . from even considering patent reform”); Press Release, Biotechnology Indus. Org., *The Patent Reform Act of 2007 Will Weaken Patents and Jeopardize Continued Biotechnology Innovation* (June 6, 2007), at http://www.bio.org/news/press_releases/newsitem.asp?id=2007_0606_02 (on file with the *Columbia Law Review*) (outlining reasons for biotechnology industry’s opposition to reform efforts).

141. See Patent Quality Hearings, *supra* note 6, at 21 (statement of David M. Simon, Chief Patent Counsel, Intel Corp.) (“These patent system bottom feeders have now become so common that Intel has coined a term to describe them: ‘patent trolls.’”).

142. See Chuang, *supra* note 16, at 242 (pointing out that proposed reforms do not eliminate potential for patent abuses).

143. See *supra* Part I.B (discussing judicial reaction to NPE debate); *supra* Part I.C (discussing proposed patent reform bills).

tion. Part II.A explains why an analysis of patent value is important for understanding whether NPEs help or harm innovation and outlines a framework to test the value of patents held by NPEs.¹⁴⁴ Part II.B presents an analysis of infringement lawsuits initiated by NPEs to determine whether they engage in frivolous litigation as alleged by their critics.

A. *An Assessment of Patents Owned by NPEs*

1. *Why Patent Value is Important.* — Economists have long recognized that all patents are not created equal and that some patents are more valuable than others.¹⁴⁵ Recognizing this fact, critics have alleged that NPEs use “kooky and vague” patents to blackmail manufacturers of successful products.¹⁴⁶ In making this assertion, critics assume that NPEs use infringement litigation to earn higher licensing fees than the invention covered by the patent deserves. As explained *infra* Part II.A.2, however, at least two possible explanations exist for why NPEs may earn high licensing fees. On the one hand, an NPE may have waited until a manufacturer sank investments into developing and marketing a successful product that infringed its patent and then threatened the manufacturer with an injunction to obtain high licensing fees.¹⁴⁷ On the other hand, the NPE may own the patent on pioneering technology that made the product possible in the first place and may just be seeking fair compensation.¹⁴⁸ The mere fact that an NPE earns high licensing fees, therefore, does not automatically imply that it exploits manufacturers. Thus, the use of variables outlined in Part II.A.2 to analyze the value of patents owned by NPEs will shed light on the question of whether NPEs deserve high licensing fees. This analysis cannot conclusively refute the possibility that NPEs behave strategically and exploit stranded manufacturers, but it can invite caution before labeling every NPE lawsuit or settlement as blackmail.

144. See *infra* Appendix B for details on the compilation of the database and the companies in it.

145. See Patents in the Knowledge Based Economy 8 (Wesley M. Cohen & Stephen A. Merrill eds., 2003) (“[V]alue distribution of patents is highly skewed[.]”); Jean O. Lanjouw et al., How to Count Patents and Value Intellectual Property: The Uses of Patent Renewal and Application Data, 46 J. Indus. Econ. 405, 406 (1998) (“[T]he importance of the innovations protected by individual patents varies widely.”); F.M. Scherer & Dietmar Harhoff, Technology Policy for a World of Skew-Distributed Outcomes, 29 Res. Pol’y 559, 565 (2000) (“Our empirical research reveals at a high level of confidence that the size distribution of private value returns from individual technological innovations is quite skew . . .”).

146. Kirby, *supra* note 8 (internal quotation marks omitted) (quoting Philip Swain, attorney for Boston Communications).

147. See *supra* notes 41–42 and accompanying text (discussing strategic pursuit of injunctions by NPEs after manufacturers have invested in development and marketing of allegedly infringing product).

148. See *supra* notes 48–51 and accompanying text (emphasizing importance of examining value of underlying patent before concluding NPE’s licensing fees are excessive).

In addition, an analysis of the value of NPE-owned patents will clarify whether NPEs are enhancing innovation by either developing important technology on their own or identifying and rewarding others who do the same.¹⁴⁹ As explained in Part I.A.2, independent inventors face numerous hurdles to reaping the financial benefits from their inventions, and NPEs can encourage innovation by identifying and rewarding independent inventors who make valuable technological breakthroughs. Therefore, a showing that NPEs own high value patents will also support the argument that NPEs encourage innovation.

2. *Analyzing Patent Value.* — A truly accurate assessment of patent value requires intensive legal and technical evaluation of individual patents.¹⁵⁰ The economics literature, however, has proposed several proxies for patent value based on objective and readily available information.¹⁵¹ In particular, this Note considers four measures:

(i.) Number of Citations Received (“Forward Cites”): Every patent application contains a “prior art” section that discloses the technology upon which the patent applicant relied when creating her invention. When the prior art of patents frequently cites a previous patent, that oft-cited patent is likely more valuable and important to the citing patents than a less-cited patent. For example, going back to the telephone example, we would expect that Bell’s patent on the core telephone technology would be more frequently cited than the patent on improvement of sound quality because any later invention relating to telephones would have to rely on Bell’s foundational patent. Thus, economists have found the number of forward cites received by a patent to be indicative of the value of that patent.¹⁵² A straightfor-

149. See *supra* notes 67–68 and accompanying text (discussing ways in which NPEs aid independent inventors).

150. Anne Layne-Farrar & Josh Lerner, To Join or Not to Join: Examining Patent Pool Participation and Rent Sharing Rules 19 (Jan. 7, 2008) (unpublished manuscript, on file with the *Columbia Law Review*), available at <http://ssrn.com/abstract=945189>. [hereinafter Layne-Farrar & Lerner, To Join or Not to Join] (“To accurately measure patent value, individual patents must be examined in detail from a legal and technical perspective.”).

151. Adam B. Jaffe & Manuel Trajtenberg, Patents, Citations, and Innovations: A Window on the Knowledge Economy 52 (2002) [hereinafter Jaffe & Trajtenberg, Innovations] (“[W]e find that measures of the overall importance of innovations, of generality of research outcomes, and of reliance on scientific sources discriminate well between more and less basic innovations.”); Manuel Trajtenberg, A Penny for Your Quotes: Patent Citations and the Value of Innovations, 21 *RAND J. Econ.* 172, 184 (1990) [hereinafter Trajtenberg, Quotes] (“[P]atent citations may be indicative of the value of innovations.”); Bronwyn H. Hall et al., The NBER Patent Citations Data File: Lessons, Insights and Methodological Tools 25–26 (Nat’l Bureau of Econ. Research, Working Paper No. 8498, 2001), available at <http://www.nber.org/papers/w8498> (on file with the *Columbia Law Review*) [hereinafter Hall et al., Data File] (discussing use of number of citations as relative measure of patent value).

152. See Trajtenberg, Quotes, *supra* note 151, at 180 (reporting medical diagnostic imaging patents of greater value were more frequently cited); Bronwyn H. Hall et al., Market Values and Patent Citations: A First Look 20 (Nat’l Bureau of Econ. Research,

ward cumulative citation count, however, can be misleading for two reasons. First, older patents receive more citations than newer patents because they have been publicly known for a longer time. Therefore, calculating the average number of citations per year that a patent has received enables us to gauge the importance and influence of a patent without the temporal bias. Second, some inventors may use each patent as an opportunity to cite all of their previous patents. Excluding these “self-citations” from the citation count enables us to more accurately gauge the influence of the patent.¹⁵³

(ii.) Number of Technology Classes Covered by Forward Cites (“Generality”): If subsequent patents belonging to a wide range of technical classes cite a patent,¹⁵⁴ then that patent likely has had an impact on a variety of fields. In contrast, if only patents in the same technical class cite a patent, then that patent likely is a narrow and minor invention. For example, a patent in radio technology that is cited by subsequent patents in wireless telephony and radar technology is likely to have more applications, and hence to be more valuable, than another patent in radio technology that is cited by subsequent patents only in that field. Citations from patents in a higher number of technology classes would therefore also generally indicate higher patent value.¹⁵⁵

(iii.) Number of Technology Classes Covered by Prior Art Patent References (“Originality”): Similarly, the number of technology classes represented in the prior art cited by a particular patent can also provide an indication of the value of that patent. A patent that draws upon the teaching of a broad variety of technical fields is likely to represent a wide-ranging technological advance, while a patent that relies on previous patents in a single technical class is likely to represent an invention with narrower applicability.¹⁵⁶

Working Paper No. 7741, 2000), available at <http://www.nber.org/papers/w7741> (on file with the *Columbia Law Review*) (finding, *ceteris paribus*, companies with more frequently cited patents have higher stock market values).

153. See Hall et al., Data File, *supra* note 151, at 19 (“[P]resumably citations to patents that belong to the same assignee represent transfers of knowledge that are mostly internalized, whereas citations to patents of ‘others’ are closer to the pure notion of (diffused) spillovers.”).

154. This Note uses the PTO’s technological classification system. The list of patent classes and their titles can be downloaded at U.S. Patent and Trademark Office, U.S. Classes by Number with Title, at <http://www.uspto.gov/go/classification/selectnumwithtitle.htm> (last visited Sept. 23, 2009) (on file with the *Columbia Law Review*).

155. Hall et al., Data File, *supra* note 151, at 21; see also Jaffe & Trajtenberg, *Innovations*, *supra* note 151, at 60 (“[I]nnovations . . . with many descendants, or with descendants that span a wide range of technical fields, are likely to have high social returns.”).

156. Jaffe & Trajtenberg, *Innovations*, *supra* note 151, at 81. While economists compute generality and originality as a Herfindahl-Hirschman Index of concentration based on the number of technology classes, see *id.* at 428–58 (describing construction of measures for generality and originality), this Note computes these measures based on

(iv.) Number of Claims: A patent's claims define its scope and delineate the precise technology that it covers.¹⁵⁷ In this sense, claims are akin to the "mete and bounds" of property deeds. A high number of claims may indicate that the patent is valuable. Because adding claims to a patent application is expensive due to the PTO and attorney fees involved, the patent applicant would pay these fees only if the underlying patent was valuable.¹⁵⁸ A patent applicant might, however, draft a single, broad claim rather than a series of narrower claims. Thus, the number of claims may provide only some indication of patent value.¹⁵⁹

This Note's database of NPE-owned patents was constructed by first searching the IPLC for every patent infringement lawsuit filed by fifty-one NPEs¹⁶⁰ and then gathering the patent numbers from the complaints in those lawsuits. Supplementing this set of patents with unlitigated NPE patents was not possible because none of the fifty-one NPEs disclose their patent portfolios to the public. Since a significant portion of the companies also do not obtain their own patents, they are not listed as assignees of patents in the USPTO. Therefore, the analysis in this Note relies solely on patents that are disclosed in infringement litigation.

Using litigated patents, however, introduces a sample selection bias to the analysis.¹⁶¹ Litigated patents are likely to be more valuable than unlitigated patents because a patent owner is less likely to mount a costly lawsuit to enforce weak or trivial patents.¹⁶² Therefore, comparing litigated NPE patents to other patents that may or may not be involved in litigation will not tell us whether NPE-owned patents are generally of higher value. This Note will therefore compare the value of litigated NPE patents to the value of patents drawn from 500 randomly selected infringement lawsuits filed between January 1, 2000 and October 1,

simple counts, which reflect the same idea but are simpler and more intuitive. In addition, although measures such as originality and generality are commonly used to gauge patent quality, they are not as powerfully predictive of patent value as forward citations. See Allison et al., *supra* note 29, at 460 (noting that while "claims, prior art references, and citations received are good measures of patent value, generality, originality and number of patent classifications are not").

157. Layne-Farrar & Lerner, *To Join or Not to Join*, *supra* note 150, at 20.

158. See Kimberly A. Moore, *Xenophobia in American Courts*, 97 *Nw. U. L. Rev.* 1497, 1544–45 (2003) (discussing number of patent claims as proxy for patent value).

159. *Id.*

160. The list of fifty-one firms was compiled by running a variety of keyword searches in news databases. See *infra* Appendix A for details on the compilation of the list of NPEs.

161. See, e.g., Allison et al., *supra* note 29, at 438 (finding in general, litigated patents are more frequently cited by subsequent patents and contain more claims). This is not surprising because a patentee is unlikely to sue for infringement if the patent in question is not valuable. Therefore, to the extent that forward citations measure the value of the patents, one would expect the litigated patents to be more highly cited.

162. See *id.* at 437–38 (explaining characteristics of litigated patents which make them more valuable).

2008.¹⁶³ This comparison will allow us to determine whether NPEs litigate patents that are weaker than other litigated patents generally. The Note then compares the value of litigated NPE patents to a subset of litigated patents (drawn from the same random NPE sample of 500 lawsuits) that are in the same technology classes as NPE patents. This will provide us with some clue about how effective NPEs are in identifying valuable technology in a given field. As discussed *supra* Part I.A.2, the patents owned by independent inventors vary widely: Some are extremely valuable, while others are trivial. If litigated NPE patents are more valuable than other litigated patents in the same technology class, then it is likely that NPEs identify and reward the more promising independent inventors. Finally, the comparison between litigated NPE patents and other litigated patents in the same technology class will also help determine whether the allegedly excessive royalties demanded by NPEs is blackmail or simply a reflection of the value of their patents.¹⁶⁴

B. *NPE Litigation Outcomes*

The primary goal of this part of the Note's analysis is to establish whether NPEs engage in abusive litigation by studying NPE litigation strategies. The comprehensive patent litigation data available from Stanford Law School's IPLC, which contains case histories of all patent infringement suits initiated between 2000 and 2008, allows us to test directly the validity of claims of abusive NPE litigation. The analysis in this section is focused on the following variables:

- (i.) The number of infringement lawsuits initiated by NPEs by year (both as a total and as a percentage of total number of infringement lawsuits in those years).
- (ii.) The outcome of litigation initiated by the NPEs: A result showing that NPEs win on their infringement claims as often as other plaintiffs would suggest that NPEs are not engaging in frivolous litigation and are legitimately defending their patent rights.
- (iii.) The number of NPE lawsuits by jurisdiction: This will test critics' claims that NPEs bring suit in plaintiff friendly jurisdictions like the Eastern District of Texas.¹⁶⁵

163. The random sample of 500 lawsuits was drawn from the Stanford IP Litigation Clearinghouse, at <http://lexmachina.stanford.edu/> (last visited Aug. 17, 2009) (on file with the *Columbia Law Review*).

164. See text accompanying *supra* notes 41–51 (discussing charges that NPEs blackmail manufacturers with licensing fees).

165. See, e.g., Victoria E. Luxardo, *Towards a Solution to the Problem of Illegitimate Patent Enforcement Practices in the United States: An Equitable Affirmative Defense of "Fair Use" in Patent*, 20 *Emory Int'l L. Rev.* 791, 818 (2006) (stating Eastern District of Texas is "a jurisdiction known for its pro-(patent) plaintiff judges and juries"); Yan Leychikis, Note, *Of Fire Ants and Claim Construction: An Empirical Study of the Meteoric Rise of the Eastern District of Texas as a Preeminent Forum for Patent Litigation*, 9 *Yale*

III. RESULTS

A. *Characteristics of NPE Patents*

This section presents the results of an analysis of 287 patents owned by the fifty-one NPEs listed in Appendix B.¹⁶⁶ Table 1 shows the breakdown of the top ten U.S. technical classes represented in the dataset while Figure 1 shows the distribution of patents by grant years. As we can see, most of the NPE patents are in high technology areas such as consumer electronics, computing, and telecommunications. While the bulk of the NPE patents were granted in the late 1990s, a few date back to the early 1980s and would have been close to expiration by 2000–2008.

B. *A Comparative Assessment of NPE Patent Value*

This section presents the characteristics of NPE-owned patents and compares them to two groups of patents. As described supra Part II.B, the 287 NPE patents were compared to a group of 731 patents drawn from 500 randomly selected infringement suits,¹⁶⁷ and also to a group of 300 litigated peer patents (drawn from the larger set of 731 patents) that belong to the same U.S. technical class as the NPE patents. Table 2 compares the means of the various measures described in Part II.B for the three groups.

As we can see from Table 2, the averages of the different variables for NPE patents greatly exceed those of the litigated and peer patent groups. In fact, the NPE averages are almost double the averages for litigated patents and considerably higher than the averages for the litigated peer patents. Moreover, Figure 2 shows that the citations to all three patent samples are spread out over time and follow the same general pattern. This pattern indicates that the differences between the citations received by the three patent groups as reflected in Table 2 are likely to persist over time.

Averages, however, are not very informative because, as evidenced by the high standard deviations, the distributions for all the measures are highly variable. The differences between the three groups can be better illustrated by box and whisker plots for the various measures of value. Box and whisker plots are a convenient way of demonstrating the size and variation of the different variables, especially when the underlying data contains very high or low values.¹⁶⁸ Figure 3 shows the box and whisker

J.L. & Tech. 193, 195 (2007) (noting Eastern District of Texas has been called “haven for patent pirates” and “hotbed for patent trolls”).

166. The actual number of NPE patents involved in litigation was 298. But since PTO citation and bibliographic data was available only for patents issued prior to 2006, eleven patents issued after 2005 were discarded from the final dataset. The author would like to thank Dr. Anne Layne-Farrar and LECG for use of the PTO data.

167. See supra note 163 (designating randomly selected sample of infringement suits).

168. See Frederick Hartwig & Brian E. Dearing, *Exploratory Data Analysis* 23 (1979) (discussing visual representations of distributions as superior to numerical summaries).

plot of the non-self forward citation variable for the NPE patents, litigated patents (labeled “Lit-All”), and the litigated peer patents (labeled “Lit-Match”). As we can see from the figure, the median non-self forward citation of the NPE patents (the line inside the box) is higher than the medians for the litigated patents and the litigated peer patents. Most importantly, the elongated shape and elevated height of the NPE patent box relative to the other two boxes shows that the range of values of non-self forward citations for the NPE patents was higher than for the patents in the other two groups.¹⁶⁹ This pattern holds true for the other variables as well, as seen in Figures 4–7. These figures show that the NPE patents analyzed in this Note tend to have higher measures of value than both the sample of litigated patents, as well as the smaller sample of litigated patents that share the same technological classes.

The insights provided by the box and whisker plots can be further buttressed by examining the high value patents in each group. Figure 8 shows that when NPE patents are grouped along with the litigated patents, the former make up about twenty-eight percent of the combined dataset. This percentage changes appreciably when we look at only the quartile of patents from the combined group that received the highest cumulative non-self forward citations (forty-seven percent) or the highest annual non-self forward citations (also forty-seven percent).

In addition, Figure 9 shows that although NPE patents comprise only forty-nine percent of the combined NPE-Litigated Peer group, they comprise sixty-three percent of the quartile of patents that received the highest cumulative non-self forward citations, and sixty-four percent of the quartile of patents that received the highest annual non-self forward citations. These percentages again show that the NPE patents in the sample have disproportionately higher values than randomly selected litigated patents and the analyzed set of litigated peer patents.

C. NPE Litigation Results

This section presents the success rate of NPEs in infringement litigation. Table 3 shows the number of infringement lawsuits filed by the fifty-one NPEs between 2000 and 2008. The table shows a general upward trend in the number of cases initiated by those NPEs, although these cases still represent a very small portion of the total number of infringement cases that are filed every year. Even in 2006, when the number of

169. All three patent groups had extreme outliers, and so the box plot graphs presented in Figures 3–7 were “clipped” by a factor of two to make the box plot more readable. The clip factor (2) is employed in the following manner: $y(\max) = (Q1 + (Q3 - Q1)) \times 2$ and $y(\min) = (Q1 - (Q3 - Q1)) \times 2$, where Q1 and Q3 are the first and third quartile values, computed across all three groups, respectively. Any outlier greater than $y(\max)$ or less than $y(\min)$ is ignored during vertical axis scaling. SAS Inst., SAS/STAT 9.2 User’s Guide 808 (2008), available at <http://support.sas.com/documentation/cdl/en/statugboxplot/61772/PDF/default/statugboxplot.pdf> (on file with the *Columbia Law Review*).

NPE lawsuits peaked, they accounted for less than four percent of the total patent infringement lawsuits filed in that year.¹⁷⁰

Table 4 shows that of the 512 lawsuits filed by NPEs, 370 have been terminated and that almost eighty-eight percent of those cases settled. This is not significantly lower than the settlement rate of the randomly selected infringement suits filed between 2000 and 2008, also presented in Table 4, but is noticeably lower than the average settlement rate of independent inventor-initiated lawsuits as reported in a 2004 study.¹⁷¹ Unfortunately, settlement terms are usually confidential and therefore inherently ambiguous; a given lawsuit may have been settled because the NPE wanted to avoid having a questionable patent invalidated or because the defendant realized that it would likely be found liable of infringement.

Of the forty-six cases in which a final judgment was issued, the district court ruled on the merits of the infringement claim in only twenty-nine cases. Twelve lawsuits were dismissed based on motions pursuant to Federal Rule of Civil Procedure 12(b)(6) and five were terminated through default judgments. Of the twenty-nine cases that received a judgment on the merits, NPEs prevailed in seven (twenty-four percent) and won a permanent injunction in five cases. In the twenty-one cases in which defendants prevailed, the district court invalidated NPE patents in three cases and held noninfringement in seven cases.¹⁷² NPE patents were also deemed valid but unenforceable in eleven cases. These eleven cases involved the famous barcode scanning patents granted to Jerome Lemelson.¹⁷³ In 2005, the Federal Circuit held that the fourteen Lemelson patents were valid but unenforceable due to prosecution laches, and did not reach the merits of the plaintiff's infringement

170. For other estimates of the relative size of NPE-driven infringement litigation, see *supra* notes 32–33 and accompanying text.

171. See Jean O. Lanjouw & Mark Schankerman, *Protecting Intellectual Property Rights: Are Small Firms Handicapped?*, 47 *J.L. & Econ.* 45, 56 *tbl.2* (2004) (reporting about ninety-five percent of lawsuits initiated by independent inventors between 1978–1999 were settled). Of course, a direct comparison with the Lanjouw & Schankerman study is inapposite because it analyzed lawsuits over a longer period of time and also used a much bigger sample. Nevertheless, one possible explanation for the lower settlement rates in NPE-initiated litigation may be that NPEs have more resources than the typical infringement plaintiffs and are therefore better able to afford drawn out litigation. See *supra* note 28 and accompanying text. On the other hand, the lower settlement rates may also imply that defendants think the NPE suits are frivolous and therefore are willing to go to trial. Yet another explanation is that, while the patents may be valid and the suits not frivolous, NPE plaintiffs are more likely to hold out for unreasonably high royalties.

172. See *infra* Table 5.

173. Jerome Lemelson is said to have collected almost \$1.5 billion in licensing fees from auto, computer, retail, and electronics companies for patents on barcode technology before the patents were held unenforceable. Greg Griffin, *Trolling For Patents*, *Denver Post*, Mar. 12, 2006, at K01.

claim.¹⁷⁴ If these eleven cases are excluded from the sample, the win rate of NPEs jumps to about thirty-nine percent.¹⁷⁵

Regardless of whether we include the Lemelson cases in the litigation analysis, NPE success rates appear to be slightly higher than the twenty-two percent win rate of plaintiffs in the 500 randomly selected infringement suits reported in the last column of Table 5.¹⁷⁶ Finally, as Table 6 indicates, NPEs do not file lawsuits predominantly in the allegedly plaintiff-friendly jurisdictions like the Eastern District of Texas.¹⁷⁷ Instead, reflecting the high technology patents owned by NPEs, the Central and Northern Districts of California together account for more than forty percent of NPE lawsuits.

D. *Implications of the Empirical Analysis*

The empirical study of NPEs has yielded results that have important implications for policymakers who are considering the role these firms play in the innovation economy. As Part II.A explains, the value of patents owned by NPEs provides an important hint as to whether these firms impede or encourage innovation. First, the results from the above analysis indicate that the high value of NPE patents may be a partial explanation for their demand for high royalties. If the NPE patents are, on average, superior to their peers, then it is not surprising that NPEs would often seek what seems like high compensation for licensing rights to their patents.¹⁷⁸ Thus, the fact that the analyzed NPE-owned patents scored better than other litigated patents, in the same technical class or otherwise, on every measure of value, indicates that NPEs may be demanding high royalty fees not because of opportunism, but because their patents are, in fact, more valuable. Second, these results also challenge the contention that NPEs use weak and vague patents to blackmail manufacturers. NPE patents receive more citations than other litigated patents and also have higher originality and generality measures, which indicate that

174. See *Symbol Techs., Inc. v. Lemelson Med., Educ. & Research Found., LP*, 422 F.3d 1378, 1385 (Fed. Cir. 2005) (“[P]rosecution laches may render a patent unenforceable when it has issued only after an unreasonable and unexplained delay in prosecution.”), amended in part by 429 F.3d 1051, 1052 (Fed. Cir. 2005) (holding laches applied to all remaining patent claims because “all of the subject matter in the patents in suit was pending for an unreasonably long period of time”).

175. See *infra* Table 5.

176. Both the NPE litigation success rate and the plaintiff success rate in the random sample, however, appear to be lower than the forty-five percent win rate of plaintiffs in infringement suits reported in a 2003 study. See Edward F. Sherry & David J. Teece, *Royalties, Evolving Patent Rights, and the Value of Innovation*, 33 *Res. Pol’y* 179, 187 (2004) (finding forty-five percent win rate in normal patent infringement cases “brought in a US Federal District Court . . . taken through to disposition either by summary judgment or by a trial court verdict”). This difference could well be driven by this Note’s shorter time period of study and smaller datasets.

177. See *supra* note 165.

178. See *supra* notes 48–51 and accompanying text (discussing relationship between patent value and licensing fees).

the NPE patents have had considerable influence on subsequent patents and are also not trivial improvements in a particular technology class.

Third, the finding that NPEs own valuable patents also bodes well for supporters who argue that these firms serve as valuable intermediaries for independent inventors. The box and whisker plots and Figure 9 show that the sample of NPE patents rank higher than their peer litigated patents in every value measure. This result may reflect the fact that NPEs are successful in performing their due diligence and identifying and rewarding inventors of the most valuable technology. One cannot draw a straightforward conclusion on this issue from the above results because the analysis relies only on litigated NPE patents. We simply do not know how these results would change if we included unlitigated NPE patents. The most we can say based on this analysis is that NPEs sometimes enhance innovation by providing capital to the most promising independent inventors and small businesses and encouraging further inventive efforts.

Fourth, this analysis of NPE-initiated lawsuits provides further evidence that NPEs do not engage in abusive litigation because the success rate of NPEs is not significantly different than that of other plaintiffs in other patent infringement suits. One cannot, however, entirely dismiss the claims of abusive litigation based on the results of Table 5 without studying the terms of settlements between NPEs and their target companies.¹⁷⁹ Finally, the analysis of NPE litigation dispels the myth that these firms bring lawsuits in plaintiff-friendly jurisdictions.¹⁸⁰

The findings from the study of NPE patent value and their litigation success rates imply that legislators should not give too much weight to the patent troll rhetoric while weighing the costs and benefits of the patent reform bill that is currently before Congress. Improving patent quality and ending abusive litigation are admirable goals, but Congress should try to achieve these goals in a manner that does not unfairly burden vulnerable groups such as independent inventors and small businesses. More importantly, legislators should not be swayed by those who use NPEs as scapegoats for the problems of the current patent system and as a justification for reforms that could have drastic consequences for the broader inventive community.¹⁸¹

This Note also suggests that courts should exercise caution before denying injunctive relief to patent owners simply because they do not practice their inventions. The Note's analysis has shown that NPEs own patents that cover valuable technologies, which implies that these firms could serve as important sources of capital and resources for indepen-

179. See text accompanying *supra* note 171.

180. See *supra* Table 6.

181. Patent Trolls Hearing, *supra* note 108, at 6 (2006) (testimony of Edward R. Reines, Esq., Weil, Gotshal & Manges, LLP) ("It is an emotional hot-button to categorize or label someone as a troll, and I would be concerned that too much focus on that would detract from the important mission of patent reform.").

dent inventors and small businesses. Denying these firms injunctive relief will hamper their ability to negotiate licensing arrangements with users of the technology. This inability to negotiate effective licensing fees will in turn make it difficult for NPEs to buy patents from successful inventors. Thus, these inventors may lose a valuable source of capital and resources, and the result may be a scenario where inventive activity is increasingly dominated by corporations with large research and development programs.

CONCLUSION

As mentioned at the outset, one cannot definitively say whether NPEs benefit or harm innovation based on the analysis of this Note. To get a more accurate picture of the role NPEs play in the innovation economy, one would need to analyze information that goes beyond what is available in the public domain: NPE licensing agreements, terms of pre-trial settlements between NPEs and their target companies, and the value of their unlitigated patents. Nevertheless, the analysis of publicly available data provides us with some evidence about the behavior of NPEs. The results of this Note's empirical analysis indicate that many NPEs in fact hold high value patents and do not engage in frivolous litigation as has been alleged by their critics. This finding not only weakens some of the arguments made by critics but also suggests that NPEs can serve a valuable role in enhancing innovation by identifying and acquiring high value patents and thereby funding and encouraging some of the most successful inventors. The analysis in this Note indicates that courts should be reluctant to give too much weight to the nonpracticing status of the patent owner while considering the grant of a permanent injunction against an infringer and also cautions against allowing the rhetoric about patent trolls to unduly influence the shape of the patent reform proposals currently before Congress.

APPENDIX A

TABLE 1—NPE PATENTS BY TECHNICAL CLASS

Technical Class	Class Description	No. of Patents	Percentage
379	Telephonic Communications	63	22.0%
348	Television	35	12.2%
370	Multiplex Communications	18	6.3%
375	Pulse or Digital Communications	16	5.6%
709	Electrical Computers And Digital Processing Systems: Multicomputer Data Transferring	16	5.6%
455	Telecommunications	13	4.5%
434	Education and Demonstration	12	4.2%
705	Data Processing: Financial, Business Practice, Management,	9	3.1%
358	Facsimile and Static Presentation Processing	7	2.4%
707	Data Processing: Database and File Management or Data Structures	7	2.4%
Other	Other	91	31.7%
Total		287	100.0%

FIGURE 1—NPE PATENTS BY GRANT YEAR

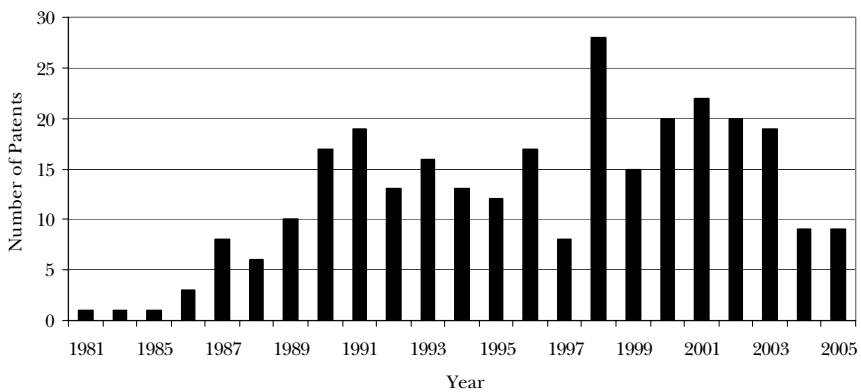


TABLE 2—AVERAGE MEASURES OF VALUE

	NPE Patents (287 obs.)		Litigated Patents (731 obs.)		Litigated Peer Patents (300 obs.)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Number of Citations Received	36.0	50.9	15.8	26.5	21.6	32.5
Number of Non-Self Citations	35.0	48.7	14.0	25.1	19.5	31.0
Number of Citations by Year	3.6	4.2	1.9	2.9	2.6	3.7
Number of Non-Self Citations by Year	3.5	4.0	1.7	2.7	2.3	3.5
Originality	6.9	7.6	4.5	4.4	4.8	4.6
Generality	6.6	5.7	3.1	3.4	3.9	3.8
Number of Claims	41.0	59.9	23.5	23.7	25.7	23.2

FIGURE 2—CITATIONS RECEIVED BY YEAR RANGE

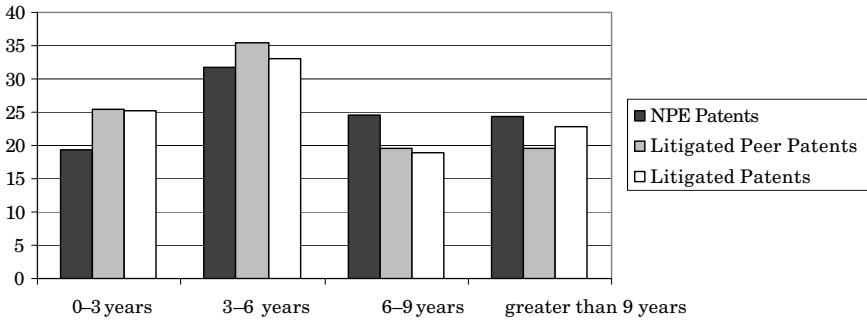


FIGURE 3—BOX AND WHISKER PLOT OF NON-SELF FORWARD CITATIONS

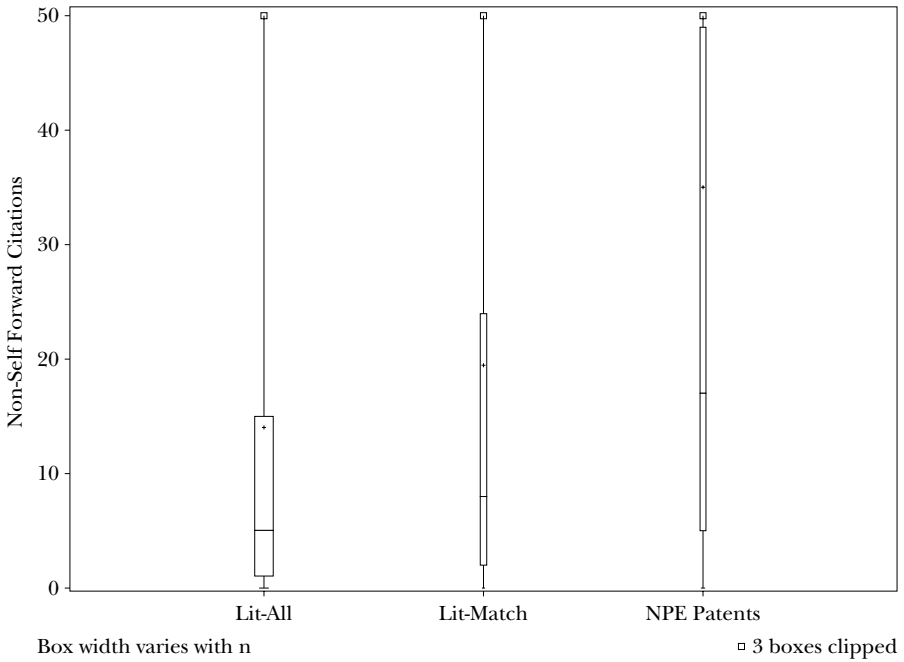


FIGURE 4—BOX AND WHISKER PLOT OF ANNUAL NON-SELF FORWARD CITATIONS

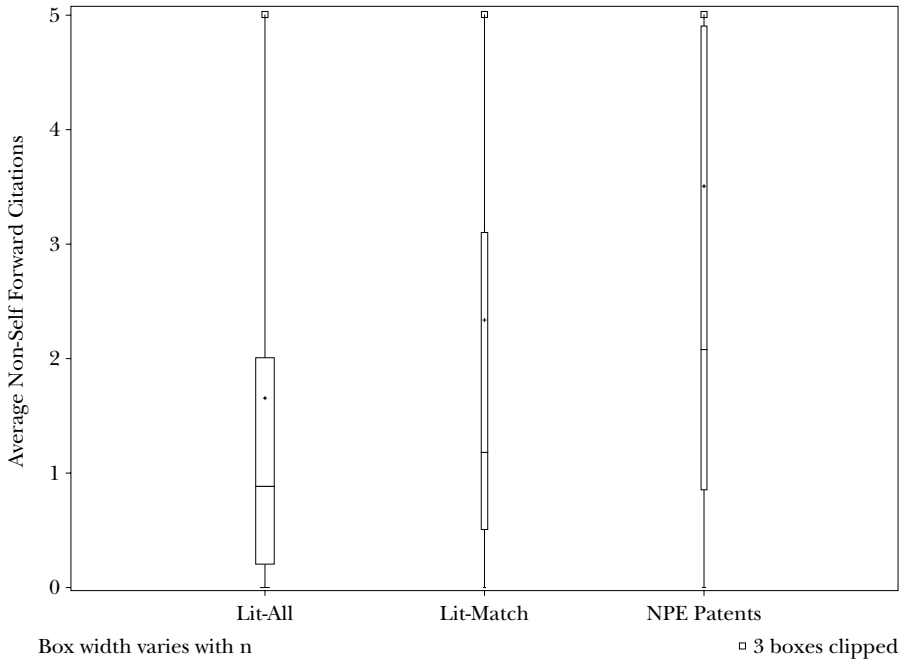


FIGURE 5—BOX AND WHISKER PLOT OF ORIGINALITY (NUMBER OF TECHNOLOGY CLASSES COVERED BY PRIOR ART REFERENCES)

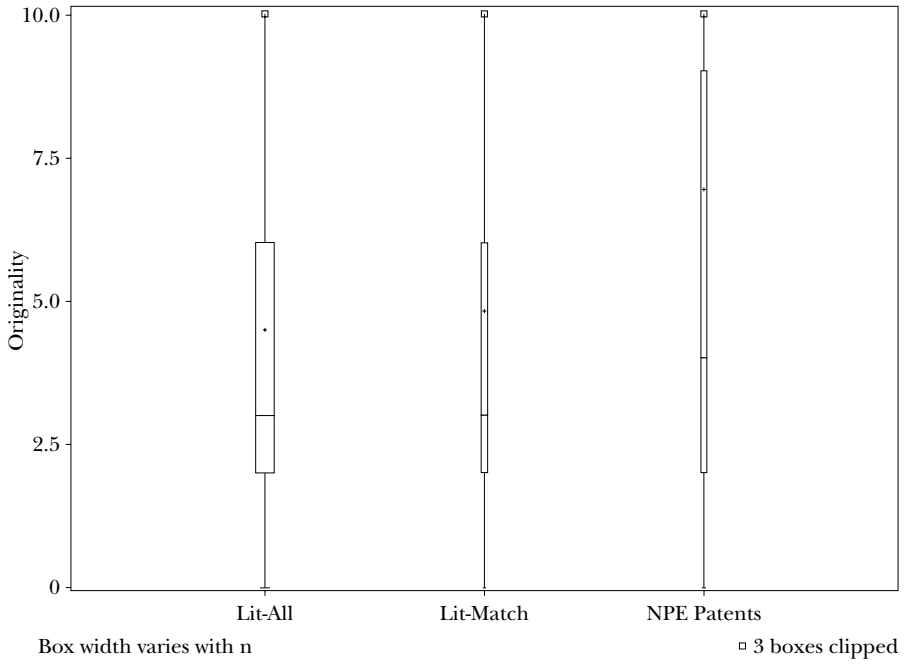


FIGURE 6—BOX AND WHISKER PLOT OF GENERALITY (NUMBER OF TECHNOLOGY CLASSES COVERED BY FORWARD CITES)

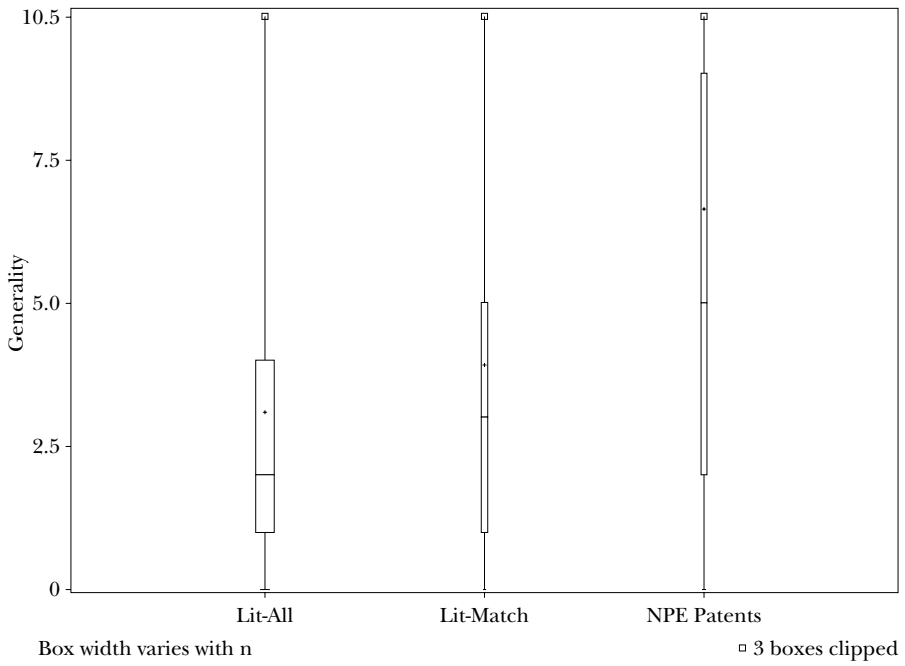


FIGURE 7—BOX AND WHISKER PLOT OF NUMBER OF CLAIMS

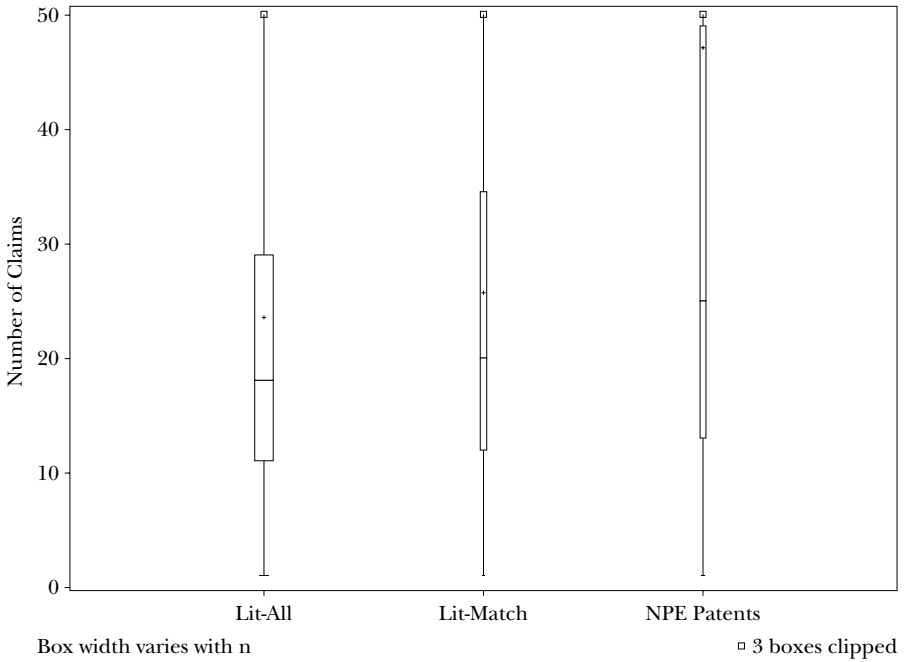


FIGURE 8—SHARE OF NPE PATENTS IN A COMBINED NPE-LITIGATED PATENTS DATASET

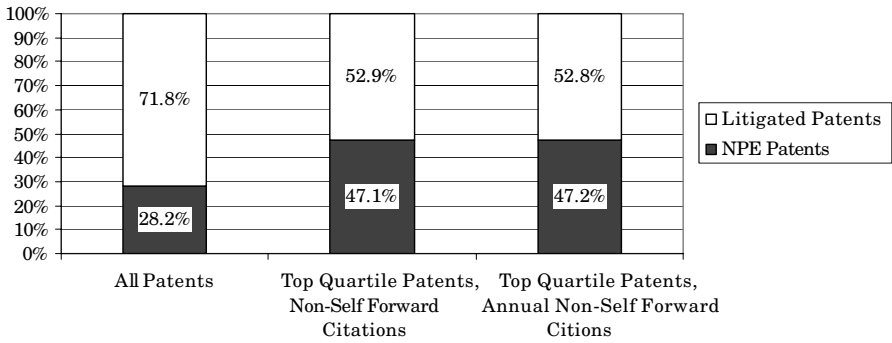


FIGURE 9—SHARE OF NPE PATENTS IN A COMBINED NPE-LITIGATED PEER PATENTS DATASET

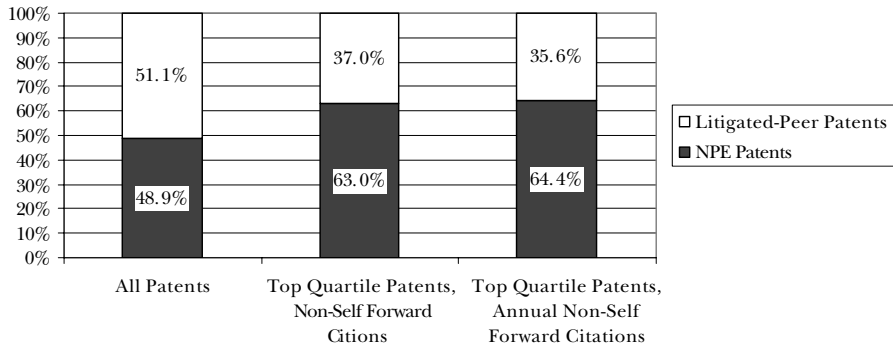


TABLE 3—NPE LAWSUITS BY YEAR

Year	Number of NPE Lawsuits	Total Infringement Lawsuits	Percentage
2000	27	2,325	1.2%
2001	28	2,465	1.1%
2002	65	2,557	2.5%
2003	51	2,784	1.8%
2004	41	2,809	1.5%
2005	72	2,566	2.8%
2006	89	2,647	3.4%
2007	81	2,840	2.9%
2008*	58	2,605	2.2%

* includes cases filed between January 1, 2008 and October 1, 2008.

TABLE 4—SUMMARY OF LITIGATION RESULTS

	NPE-initiated Lawsuits		Random Sample of Lawsuits	
	Number	Percentage	Number	Percentage
Total Number of Cases	512		500	
Pending	142		121	
Terminated cases	370	100.0%	379	100.0%
Settled	324	87.6%	344	90.8%
Judgment	46	9.0%	35	9.2%
Judgment on the Merits	29	5.7%	23	6.1%

TABLE 5—NPE SUCCESS RATES

	NPE Success Rate (including Lemelson Cases)		NPE Success Rate (excluding Lemelson Cases)		Plaintiff Success Rate in Random Sample	
	Number	Percentage	Number	Percentage	Number	Percentage
Judgment on the Merits	29	100.0%	18	100.0%	23	100.0%
Judgment for Plaintiffs	7	24.1%	7	38.9%	5	21.7%
Injunction Issued	5	17.2%	5	27.8%	5	21.7%
Judgment for Defendants	21	72.4%	10	55.6%	18	78.3%
Patent Invalid	3	10.3%	3	16.7%	1	4.3%
No Infringement	7	24.1%	7	38.9%	17	73.9%
Patents Unenforceable	11	37.9%	n/a	n/a	n/a	n/a

TABLE 6—NPE LAWSUITS BY JURISDICTION

Federal District	Number	Percentage
C.D. Cal.	126	24.6%
N.D. Cal.	100	19.5%
E.D. Tex.	54	10.5%
D. Del.	37	7.2%
N.D. Ill.	34	6.6%
Other	134	26.2%
Total	512	100.0%

APPENDIX B

Since most NPEs are private entities and are usually not listed as patent assignees at the PTO, the news media is the only means, in the public domain, of compiling a list of NPEs. For the purposes of this Note, I ran a series of keyword searches on the Lexis database containing articles from major newspapers and wire services: (a) patent w/p troll or “patent holding compan!” (637 hits on Sept. 9, 2008); (b) patent w/p “non practicing entit!” (3 hits on Sept. 27, 2008); (c) “patent licensing compan!” or “patent licensor” (200 hits on Oct. 1, 2008); and (d) (“technology licen! partnership” or “technology licen! company”) w/s patent (145 hits on Oct. 1, 2008). These searches employ terminology that is often used in the popular media to refer to NPEs and they enabled me to compile a set of ninety-nine NPEs of which fifty-one had initiated lawsuits between 2000 and 2008. The fifty-one firms, listed in Table B.1, do not comprise the universe of NPEs, but rather represent the more famous and controversial firms which have borne the brunt of the criticism for troll-like behavior.

TABLE B.1

1st Media	Net P&L, Inc.
1st Technology LLC	Neutrino Development Corporation
Acacia Research Corporation	NTP, Inc.
AdvanceMe	PanIP
Audio MPEG	PharmaStem Therapeutics
Blackboard Inc.	Plutus IP
BTG	Polaris IP
Burst.com Inc.	Power Mosfet Technologies
C2 Global Technologies Inc.	Prism Technologies LLC
Catch Curve, Inc.	Rates Technology
DDR Holdings	Ronald A. Katz Technology Licensing LP
Forgent Networks	SCO
Freedom Wireless	Solaia Technology
Friskit, Inc.	St. Clair Intellectual Consultants Inc.
Furnace Brook	Symyx Technologies
Global Patent Holdings LLC	Technology Licensing Company
InPro II Licensing Sarl	Technology Licensing Corp.
InterDigital, Inc.	Technology Properties Limited (The TPL Group)
IP Innovation	TechSearch LLC
IPCo, LLC	TGIP
IPLearn, LLC	Typhoon Touch Technologies
Karlin Technology	Veritec, Inc.
Kinetech, Inc.	Voice Capture Inc.
Klausner Technologies	Web Telephony
Lemelson Partnership	Wi-LAN
MercExchange	