



**U.S. GOVERNMENT ACCOUNTABILITY OFFICE STUDY OF LITIGATION BY NON-PRACTICING ENTITIES
UNDER SECTION 34 OF THE AMERICA INVENTS ACT**

Comments of the Innovation Alliance

The Innovation Alliance (“IA”) is pleased to submit the following comments for consideration by the U.S. Government Accountability Office (“GAO”) in connection with its study of patent litigation by so-called non-practicing entities (“NPEs”) and patent assertion entities (“PAEs”) under Section 34 of the America Invents Act (“AIA”)¹. The Innovation Alliance represents innovators, patent owners, and stakeholders from diverse industries. Innovation Alliance members believe in the critical importance of maintaining a strong patent system that supports innovative enterprises across the country, helping to fuel the innovation pipeline and drive the 21st century economy.

Section 34 of the AIA requires the GAO to “conduct a study of the consequences of litigation by non-practicing entities, or by patent assertion entities, related to patent claims made under title 35, United States Code, and regulations authorized by that title.” It further requires the study to address the following six issues:

- (1) The annual volume of litigation described in subsection (a) over the 20-year period ending on the date of the enactment of this Act.
- (2) The volume of cases comprising such litigation that are found to be without merit after judicial review.
- (3) The impacts of such litigation on the time required to resolve patent claims.
- (4) The estimated costs, including the estimated cost of defense, associated with such litigation for patent holders, patent licensors, patent licensees, and inventors, and for users of alternate or competing innovations.
- (5) The economic impact of such litigation on the economy of the United States, including the impact on inventors, job creation, employers, employees, and consumers.
- (6) The benefit to commerce, if any, supplied by non-practicing entities or patent assertion entities that prosecute such litigation.

No later than one year after the date of enactment of the AIA (i.e., by September 16, 2012), the Comptroller General must submit to the House and Senate Judiciary Committees “a report on the results of the study required under this section, including recommendations for any changes to laws and regulations that will minimize any negative impact of patent litigation that was the subject of such study.”

¹ Leahy-Smith America Invents Act, Pub. L. 112–29, 125 Stat. 284 (2011).

On September 7, 2011, shortly before the enactment of the AIA, the Comptroller General submitted a letter to Senate and House Judiciary Committee leadership expressing concern that this “mandate would require GAO to undertake a study involving several questions for which reliable data are not available and cannot be obtained.”² The Comptroller’s letter went on to identify several obstacles that would preclude a meaningful and defensible economic study of the effects of litigation by non-practicing entities:

- “In the first instance, the mandate would require identification of non-practicing entities that bring patent lawsuits. While some information about these entities may be obtainable, a definitive list of such entities does not exist and there is no reliable method that would allow us to identify the entire set from court documents or other available databases.”
- “Quantifying the cases found to be meritless by a court would produce a misleading result, because we understand most of these lawsuits are resolved by confidential settlement.”
- “There is no current reliable source of information from which to estimate the effects of litigation by such entities on patent claims, litigation costs, economic impacts, or benefits to commerce.”
- “Because GAO does not have legal access to these private parties, we would have to rely on voluntary production of such information, a method we believe would be unreliable under these circumstances and would yield information that is not likely to be comparable from entity to entity.”
- “Finally, empirical estimates of the effects of patent litigation on various economic variables would likely be highly tenuous. Measures of the cost of litigation or other variables related to quantifying patents or litigation would be highly uncertain and any relationships derived would likely be highly sensitive to small changes in these measures.”

In light of these challenges, the Comptroller advised Congress that the proposed study would “lead to inconclusive results, or results so heavily qualified that they likely would not be meaningful or helpful to the Congress,” and noted that “recent regulatory efforts to determine the economic and anticompetitive effects of such litigation have not been successful.”³

Based on IA’s review of the limited research in this area, we share the Comptroller’s assessment that an economically sound and useful study of NPE/PAE litigation may not be possible. As the Comptroller so clearly articulates in his letter, there is insufficient empirical evidence to address fairly and accurately the issues included in the study mandate. Moreover, as we discuss below, the existing data refutes any suggestion of an NPE or PAE-driven litigation crisis or widespread litigation abuses by NPEs or PAEs.

Even more fundamentally, there is no agreed definition of a “non-practicing entity” or “patent assertion entity” (and Section 34 fails to define the terms or otherwise clarify the intended scope). Without an agreed definition of the class of litigants to be studied, it is not possible to quantify accurately the prevalence or effects of litigation by NPEs or PAEs. Simply put, you cannot measure what

² Letter from Gene L. Dodaro, Comptroller Gen. of the United States, to Senator Patrick J. Leahy, Senator Charles Grassley, Representative Lamar Smith, Representative John Conyers, Jr., and Representative Jason Chaffetz (Sept. 7, 2011).

³ Id.

you cannot define. Although a handful of legal scholars and economists have recently attempted to do just that — at least with respect to NPEs — their studies utilize different definitions. (Note that we found no meaningful empirical research on PAEs as a separate, defined class of patent owners.) As a result, there is no coherent body of research from which to draw defensible conclusions.

Regrettably, Congress elected to retain its original study mandate despite the GAO’s well-founded concerns. GAO, of course, must comply with Section 34 and conduct the best study that it can based on available information. To assist GAO in this task, IA has provided below an overview of the existing studies and reports on litigation by trolls, NPEs, and PAEs and patent litigation generally. Because NPEs have been broadly defined in certain studies to encompass virtually any entity that lacks the infrastructure necessary to manufacture or commercialize a product, including entities that specialize in R&D and licensing, we have also included findings from studies of universities and small innovative patent owners (while acknowledging that some experts advocate a definition of NPE that would exclude innovative entities).

Based on our survey of the relevant literature, IA offers the following conclusions for GAO’s report:

1. As noted above, there is no agreed definition of an NPE or PAE, and past efforts by Congress and experts to achieve consensus on a specific definition have failed. (In fact, many experts believe that the terms NPE and PAE are incapable of a clear, principled definition that would capture all “bad” actors but exclude the vast majority of “good” actors in the class.) Instead, researchers have, in recent years, used an array of different terms and inconsistent criteria to define and analyze the universe of cases brought by NPEs and similar classes of litigants, including definitions that would encompass universities, research institutions, and other highly innovative businesses. As a result, the findings from such studies are of limited utility and insufficient to support any definitive conclusions. Moreover, many experts agree that efforts to categorize certain classes of patent litigants are self-serving – and arguably hypocritical – since virtually all large “practicing” patent owners have acted as NPEs and/or PAEs with respect to significant parts of their portfolios.⁴
2. There is no evidence of significant increases in patent infringement suits. To the contrary, patent litigation rates have remained relatively constant over time and have actually declined in recent years. This is the case despite periodic surges in patent litigation, which are common in periods of intense technological development and typically reflect a rapidly growing market in a state of flux. One recent example is the highly publicized “smartphone wars,” in which leading producers mobile devices and operating system software have filed a spate of patent cases in the U.S. and internationally to strengthen their competitive position. Over time, these “battles of the titans” — which are driven by major market players that are generally not considered to be NPEs or PAEs — are resolved through cross-licenses, royalty agreements, and other mechanisms.

⁴ Please note that for ease of narration, our literature survey simply adopts the definitions used by the various authors surveyed, without endorsing any of those definitions.

3. No data exist to suggest that litigation by so-called NPEs or PAEs (or, for that matter, any other patent owners) has resulted in meaningful increases in patent litigation or excessive litigation costs – regardless of how such terms are defined. To the contrary, the existing research suggests that NPEs are no more litigious than practicing entities, succeed in court at about the same rate as practicing entities, and – at least in the case of innovative NPEs – often sue to enforce valuable patents.
4. There is significant empirical evidence that innovative entities such as startups, universities, research institutions, and technology licensing businesses – often labeled NPE or PAEs – are critically important to U.S. commerce. Experts agree that collaboration across a diverse spectrum of market participants, including upstream innovation specialists, is the most fertile environment for cutting edge innovation and job growth. Strong, alienable patent rights – backed by a credible threat of enforcement – drive collaboration throughout our innovation economy. NPEs and PAEs comprise a significant and necessary part of this ecosystem and one that is vitally dependent on patents to flourish.
5. The fact that patent owners sometimes resort to civil litigation is not indicative of a problem. As with any property right, a patent is valuable because it confers rights that can be enforced in a court of law. Otherwise, the patent owner’s right to exclude would be meaningless. If anything, the fact that NPEs and PAEs resort to litigation demonstrates that despite the considerable cost of litigation to all parties – particularly small innovative firms – our patent laws and judicial system offer a fair, nondiscriminatory, and reliable adjudicative process to resolve patent disputes when other options fail. The final question of Section 34 acknowledges these potential benefits, but the broader study mandate erroneously suggests that the lawful decision by an NPE or PAE to enforce its patents through litigation is inherently suspect.
6. As with other types of high stakes commercial litigation, the costs and inefficiencies of patent litigation are often driven by factors that are independent of a litigant’s business model – e.g., the size of the claim, discovery, pleading standards, and judicial delays, among others. Our federal courts already possess and utilize the tools necessary to address undesirable litigation conduct and inefficient processes that exacerbate litigation costs. Public policy recommendations that disfavor NPEs, PAEs, or any other class of patent owners will inevitably penalize the vast majority of good actors that fall within that class while ignoring the bad actors that do not.

Unfortunately, the study mandate and all but the final study question suggest that NPEs and PAEs are, by virtue of their business model, harmful to competition and innovation. There is no basis for this sweeping generalization. To the contrary, in a diversified, innovation-intensive economy such as ours, specialized non-manufacturing firms play a crucial role in driving technological development. Our patent laws are designed to incentivize and support a variety of business models, as is the case with our system of laws generally. To castigate all patent owners that lack a vertically integrated structure is bad policy, bad economics, and plainly wrongheaded – particularly when innovation-centric firms comprise much of our patent ecosystem.

There may be examples of NPEs and PAEs that engage in abusive litigation tactics, but one can readily find examples of vertically integrated manufacturers that do the same or that refuse to respect patent rights unless compelled by a court to do so. U.S. law historically has aimed to penalize proven

harmful behavior and practices without condemning entire business models. It is unfortunate that the study mandate suggests a departure from sound policy in this respect. The final study question asks GAO to assess the potential benefits of NPEs and PAEs to U.S. commerce, and we would encourage the Comptroller General to give due emphasis to this aspect of the study in his report.

The patent community has spent the better part of a decade attempting to craft patent reforms that promote a more efficient and balanced system for all patent owners and implementers. The AIA is the culmination of this effort. We would encourage the GAO to shift its focus away from NPEs and PAEs *per se* and instead highlight specific conduct, practices, and procedures that exacerbate the cost and prevalence of patent litigation, regardless of the patent owner's business model. Moreover, the GAO's report should also consider practices by alleged infringers that may increase litigation costs or obstruct attempts to resolve disputes outside the courtroom.

I. The Futility of Attempting to Define NPEs and PAEs: A Solution in Search of a Problem

- A. Trolls, NPEs, PAEs, and similar terms have evolved as a political device to drive patent reforms that would benefit large incumbent manufacturers to the detriment of small innovators.

NPEs and PAEs – the focus of the study mandate – are but two of the many terms used by critics of the patent system to distinguish and marginalize the position and rights of patent owners that lack a vertically integrated structure necessary to “practice” or manufacture a product. One of the earliest and most pejorative of such terms is “patent troll,” a phrase popularized by Intel in 2001 and more broadly embraced to build support for litigation reforms that aim, in significant part, to decrease the risk of infringement liability for large technology aggregators.⁵ Although less politically charged than troll, the NPE terminology nevertheless is meant to carry a negative connotation. The term “patent assertion entity” is a more recent variant and appears to target a subset of NPEs that acquire portfolios of patent rights for the sole or primary purpose of enforcing them against existing products.⁶ Other terms include “non-producing entity,” “non-competing entity,” “patent aggregator,” “patent speculator,” . . . and the list goes on and on.

The NPE/PAE rhetoric has been widely used to create a mythology of an imbalanced patent system that allows bad actors to assert overly broad and poor quality patents against existing products or services to secure excessive settlements or damage awards. The mythology further suggests that virtually all infringement by large technology manufacturers is inadvertent and unavoidable through

⁵ See, e.g., Lisa Lerer, Quick Draw: Raymond Niro Sues First, Settles Fast, and Collects Millions, *IP L. & Bus.*, July 2006, at 54. Before adopting the troll terminology, Intel's counsel had used the term “patent extortionist” to discredit a patent owner that had sued Intel for infringement, which resulted in a follow on suit for libel. See Brenda Sandburg, *Trolling for Dollars*, *The Recorder*, July 30, 2001, available at <http://www.phonetel.com/pdfs/LWTrolls.pdf>.

⁶ Professor Colleen Chien claims to have coined the term PAE in a 2010 *Hastings Law Journal* article. See Colleen V. Chien, *From Arms Race to Marketplace: The Complex Patent Ecosystem and Its Implications for the Patent System*, 62 *Hastings L.J.* 297 (2010). The term was subsequently adopted by the Federal Trade Commission in its 2011 report on patents. See Federal Trade Commission, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* 8 (2011).

normal patent clearance processes, and that the royalties or damages paid by such manufacturers represents a “tax” on products and ultimately innovation.⁷

As a political device, the troll/NPE/PAE terminology has fueled much of the public policy debate on patents for the past decade. Nevertheless, none of the terms has an agreed meaning,⁸ and virtually all of the negative commentary on trolls, NPEs, and PAEs is based on anecdote or recent studies with a clear ideological and political agenda disfavoring strong patent rights, particularly for small patent owners in the IT sector. Indeed, certain highly critical studies of NPEs have been funded, at least in part, by a handful of large IT manufacturers that would benefit from a two tier patent system that preserves strong rights and remedies for manufacturers but relegates non-practicing entities to an inferior class of patent owner.⁹

The danger of such a systemic shift is that it would undermine patent protection for those innovative entities most in need of strong, predictable property rights and preserve the status quo for large product manufacturers that amass patents largely for competitive purposes. Moreover, it flies in the face of a key historical objective of our constitutionally-based patent laws, namely to “democratize” incentives to invent and in so doing to encourage a more competitive, entrepreneurial economy. In particular, our founders sought to replace the “patronage” regime that typified patent rights in 18th and 17th century England with a system that encouraged broad-based innovative activity.¹⁰

⁷ See, e.g., See Federal Trade Commission, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* 53 (2011) (citing Daniel P. McCurdy, *Patent Trolls Erode the Foundation of the U.S. Patent System*, *Sci. Progress*, Fall & Winter 2008/2009 at 82 (the patent system’s treatment of NPEs “can actually serve to diminish competition, and increase prices to consumers, by rewarding entities to not put products and services in the market but rather taxing those that do”), *available at* <http://www.scienceprogress.org/wpcontent/uploads/2009/01/issue2/mccurdy.pdf>; Brian Kahin, *Written Submission, The Patent Ecosystem in IT: Business Practice and Arbitrage*, at 10-12 (Dec. 5, 2008), *available at* <http://www.ftc.gov/bc/workshops/ipmarketplace/dec5/docs/bkahin2.pdf>.

⁸ Studies that examine patent litigation have expressed the same concern. See, e.g., 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, 1608 (2009) (“Defining and identifying trolls is an inexact science . . .”).

⁹ See, e.g., James Bessen, Jennifer Ford, and Michael J. Meurer, *The Private and Social Costs of Patent Trolls* (Boston Univ. School of Law Working Paper, 2011) (funded in part by the Coalition for Patent Fairness).

¹⁰ See, e.g., B. Zorina Khan & Kenneth L. Sokoloff, *Institutions and Technological Innovation during Early Economic Growth: Evidence from the Great Inventors of the United States, 1790-1930*, National Bureau of Economic Research (Working Paper 10966, 2004).

- B. There is no agreed definition of a “non-practicing entity” or “patent assertion entity.” Recent studies on trolls and NPEs adopt a range of inconsistent definitions that undermine their reliability.

In recent years, certain legal academics and economists have conducted studies of litigation activities by so-called trolls and NPEs. However, because these studies adopt a variety of definitions and criteria to classify certain non-practicing patent owners, they fail to achieve a cohesive body of empirical research. Some researchers have adopted a very broad definition of troll or NPE, which would encompass any entity that lacks the infrastructure to compete in the marketplace, while others have focused more narrowly on either non-innovative patent owners or “bad” actors who use the threat of litigation to secure excessive settlements or damages.

Below is a sampling of the different definitions and approaches, which is by no means exhaustive –

- “A nonpracticing entity (‘NPE’) is defined as an entity that does not have the capability to design, manufacture, or distribute products with features protected by the patent.”¹¹
- “The term NPE generally refers to a patentee that does not make products or ‘practice’ its inventions. Over time, the definition [of non-practicing entity] has been narrowed to exclude actors in the innovation enterprise who engage in significant research and development activities and individual inventors who seek to commercialize their inventions. . . . [T]he term NPE in this Article refers to a corporate patent enforcement entity that neither practices nor seeks to commercialize its inventions.”¹²
- “ ‘[N]oncompeting patent holders’ . . . are . . . patent holders who neither compete with an infringer nor exclusively license to someone who does.”¹³
- “Universities are non-practicing entities. They share some characteristics with trolls, at least if the term is broadly defined, but they are not trolls. . . . What we ought to do is abandon the search for a group of individual companies to define as bad actors. In my view, troll is as troll does.”¹⁴
- “Under a popular although highly controversial definition of a troll, the concern is that firms holding [up] patents that they do not practice (i.e., “non-practicing” or “non-competing” firms) impose undue costs on downstream manufacturers by charging more in licensing fees than their patented technology justifies.”¹⁵

¹¹ Chris Barry et al., PricewaterhouseCoopers, 2011 Patent Litigation Study 34 (2011).

¹² 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, 1577-78 (2009).

¹³ John M. Golden, “Patent Trolls” and Patent Remedies, 85 Tex. L. Rev. 2111, 2114 (2007).

¹⁴ Mark A. Lemley, *Are Universities Patent Trolls?*, 18 Fordham Intell. Prop. Media & Ent. L.J. 611, 612 (2008).

¹⁵ Damien Gerardin et al., *Elves or Trolls? The Role of Non-Practicing Patent Owners in the Innovation Economy 3* (Tilburg Law and Economics Center (TILEC) Discussion Paper No. 2008-018, May 2008) (citing several studies with various definitions of “trolls”).

- “A patent troll is a person or entity who acquires ownership of a patent without the intention of actually using it to produce a product. Instead, the patent troll buys the patent and either licenses the technology to a person or entity that will incorporate the patent into a product, or it sues a person believed to already have incorporated the technology in a product without permission.”¹⁶
- “[S]o-called ‘patent trolls’ . . . while responsible for little or no novel and non-obvious inventions, are able to obtain significant patent royalty payments from companies with revenue streams that can be put at risk in patent infringement cases.”¹⁷

Even the harshest critics of the patent system have recently acknowledged the absurdity of advocating public policy changes that would discriminate against the many innovative entities that fall within a broad definition of troll or NPE.¹⁸ As a result, they have shifted their sights to PAEs, a subset of NPEs that acquire patents in the secondary market and assert them against product manufacturers. The PAE terminology appears to have entered the patent reform lexicon in 2009 and was embraced by the Federal Trade Commission in its 2011 Report on the “Evolving IP Marketplace” (“The FTC Report”). The FTC Report defines PAEs as “firms whose business model primarily focuses on purchasing and asserting patents . . . against manufacturers already using the technology, rather than developing and transferring technology.”¹⁹ However, the Report offers no empirical data on litigation activities by PAEs.

As further explained below, the PAE terminology suffers from the same fundamental defects and biases as its predecessors – it seeks to condemn business models that are not only permissible under U.S. patent law but that enable and often foster a dynamic market in patented innovations. And it does so without any empirical evidence of harm. Moreover, whether a patent owner is labeled a PAE (or for that matter, a troll or NPE) invariably depends on the rhetorical bent and/or commercial self-interest of the commenter. In his study of troll myths, Professor Michael Risch succinctly describes the futility of attempting to define a troll, NPE, or PAE and the self-serving motives of those who perpetuate the mythology: “To be sure, whether an NPE qualifies as a troll depends on who is doing the name-calling. Regardless of definition, though, commentators have used little evidence to support their positions.”²⁰

¹⁶ 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, 189 (2007).

¹⁷ Carl Shapiro, *Injunctions, Hold-Up, and Patent Royalties 3* (Haas School of Business Working Paper, 2006).

¹⁸ Paul H. Roeder, *Patent Litigation Investors Follow the Money to the ITC* (Mar. 4, 2012), <http://www.ipwatchdog.com/2012/03/04/patent-litigation-investors-follow-the-money-to-the-itc/id=22553/> (“I will not use the term ‘Non Practicing Entity’ or ‘NPE’ because it sweeps in patent holders . . . such as universities. . .”). See also 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, 1577-78 (2009) (“Over time, the definition [of non-practicing entity] has been narrowed to exclude actors in the innovation enterprise who engage in significant research and development activities and individual inventors who seek to commercialize their inventions.”).

¹⁹ See Federal Trade Commission, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* 8 (2011).

²⁰ Michael Risch, *Patent Troll Myths*, 42 *Seton Hall L. Rev.* (forthcoming 2012).

- C. Even critics of the patent system agree that definitions of NPEs and PAEs inevitably and unfairly prejudice “good” actors within the designated class and ignore the undesirable conduct of bad actors that fall outside.

When the House Judiciary Committee conducted an oversight hearing in 2006 on the issue of what constitutes a patent troll (the “2006 House Hearing”), the witnesses agreed that the term defies a rational definition that captures all so-called bad actors while excluding good actors. Any categorical definition would inevitably include patent owners that engage in R&D and other pro-competitive activities while excluding certain large manufacturers that game the system, whether as owners or implementers of patented technology.

Prolific American inventor Dean Kamen observed that broad brush policy measures that aim to attack the few bad actors in an entire class of patent owners would inevitably cause greater harm to the thousands of innovative firms within that class. Moreover, such measures would ignore the existence of bad actors among alleged infringers that exploit their greater size and resources to avoid payment of licensing fees. Kamen’s statement underscores the risks of ill-advised policy reforms that might chill any part of our innovation economy –

[W]hen bad actors game a system, and it happens in every system everywhere, I think the people it ends up hurting the most specifically isn’t even the public. It is the good actors in that same system, because it puts them in question, in doubt, and it typically elicits a response which tries to fix it with a broad brush. . . . In this particular focus, everybody’s focusing on one kind of bad actor, the troll, or whatever you call somebody who is abusing the system by exerting unrealistic, unreasonable, unfair influence. . . . But there is equally bad potential at the other end, companies that knowingly, willfully violate things because they think it is too hard to go after them.²¹

Randall R. Rader, the Chief Judge of the U.S. Court of Appeals for the Federal Circuit, echoed a similar warning in a 2011 speech on “The State of Patent Litigation.”²² While acknowledging that certain patent owners may engage in “troll-like” behavior by attempting to enforce a patent beyond its actual value, he noted that patent litigation is equally abused by large “grasshoppers” that refuse to pay for patented technologies –

Every “troll” discussion, however, needs a note of balance. Just as trolls litter the patent system with marginally meritorious lawsuits, so the system also suffers from the IP “grasshopper.” The IP grasshopper is the entity that is quick to steal the “inventor-ant’s” work and research investment because he did no work himself and the winter of competition approaches. We can recognize the grasshopper because he refuses to pay any license fee until his legs and claws are held to the proverbial litigation fire. Once again, a grasshopper is hard to define, but I can

²¹ Patent Trolls: Fact or Fiction? Hearing Before the Senate Subcomm. on Courts, the Internet, and Intellectual Property, 109th Cong. 56 (2006) (statement of Dean Kamen, President, DEKA Research & Development Corporation).

²² Randall R. Rader, Chief Judge, U.S. Court of Appeals for the Fed. Circuit, Address at the Eastern District of Tex. Judicial Conference: The State of Patent Litigation (Sept. 27, 2011).

venture a description according to the same basic notion that helped us identify the troll: A grasshopper is any entity which refuses to license even the strongest patent at even the most reasonable rates. Frankly I am not sure who causes more meritless litigation—the troll asserting patents beyond their value or the grasshopper refusing to license until litigation has finally made it impossible to avoid. I am surer, however, that both the troll and the grasshopper tend to blame and feed off of each other.²³

- D. The prudent course is to focus on systemic inefficiencies and undesirable behavior that may exacerbate litigation costs, not amorphous categories of litigants or business models.

Chief Judge Rader went on to conclude that because trolls and grasshoppers are defined by their abusive behavior – which cannot be identified until the abuse occurs – bad actors cannot be defined or controlled in advance.²⁴ However, as discussed in Section IV of these comments, he went on to recommend measures to address and discourage abusive behavior when it does occur.

Similarly, witnesses at the 2006 House Hearing, which included Time Warner’s chief patent counsel and a past president of the Federal Circuit Bar Association, encouraged Congress and the courts to shift their focus to undesirable or abusive behaviors, without regard to the litigant’s business model or its position as plaintiff or defendant –

I think there is consensus on the table that it is hard to define the [troll] problem and also that it is really the behaviors that we ought to focus on and the impact of those behaviors. . . . [I]f you ask the question what is the degree of prevalence of patent troll behavior, you assume that there is an empirical answer, and it is difficult to give you an empirical answer unless one can come up with an agreed definition, which I think most people would agree is hard to do.”²⁵

* * *

I think it is very elusive to come up with a definition [of patent troll] that’s neither overinclusive nor underinclusive. 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. So I think it is to understand there are patent trolls, but the way I see for patent reform, you roll up your sleeves and you craft patent reform, is to address abusive practices, whoever engages in it and not try to necessarily define something with certainty and go at it that way. Regarding undesirable conduct, that is worthy of attention regardless of who engages in those actions.²⁶

²³ Id. at 17-18.

²⁴ Id. at 18.

²⁵ Patent Trolls: Fact or Fiction? Hearing Before the Senate Subcomm. on Courts, the Internet, and Intellectual Property, 109th Cong. 46 (2006) (statement of Chuck Fish, Vice President and Chief Patent Counsel, Time Warner, Inc.).

²⁶ Patent Trolls: Fact or Fiction? Hearing Before the Senate Subcomm. on Courts, the Internet, and Intellectual Property, 109th Cong. 18-19 (2006) (statement of Edward R. Reines, Weil, Gotshal & Manges, LLP).

- E. It is impossible to define the metes and bounds of a study on NPEs, as the term potentially encompasses any patent owner, including large manufacturers, that fails to practice all of its patent portfolio. Similarly, like PAEs, many practicing entities acquire patents in the secondary market.

Given this definitional conundrum, it is particularly troubling that Section 34's study mandate focuses on litigation by NPEs, which potentially encompass the broadest spectrum of patent owners, including the majority of innovative universities, research institutions, and entrepreneurial startups in this country. Many innovators that might fall within one or another definition of an NPE invest heavily in groundbreaking areas of research and development and, due to resource constraints, limit their patenting activity to valuable and potentially viable inventions. It stands to reason that such innovation specialists may lack the resources, expertise, and economies of scale necessary to manufacture a product or compete in the marketplace. There is no reason, however, to suggest that litigation by such entities is inappropriate, a tax on our economy, or otherwise problematic.

Moreover, if taken to its logical conclusion, a broad definition of NPE or PAE would include large manufacturers that assert patents not embodied in their products. Even large vertically integrated manufacturers are likely to be NPEs or PAEs with respect to some significant portion of their patent portfolio. As Chief Judge Rader observed, "the NPE designation sweeps in some unintended 'culprits' like universities and research clinics and can also extend to almost every corporation and business because they practice only a fraction of their patent portfolio."²⁷

Large technology companies tend to be the most prolific users of our patent system and amass tens of thousands of patents, many of which are acquired from other entities.²⁸ As evidenced by Google's recent acquisitions of a combined 20,000+ patents from IBM and Motorola Mobility,²⁹ such

²⁷ Randall R. Rader, Chief Judge, U.S. Court of Appeals for the Fed. Circuit, Address at the Eastern District of Tex. Judicial Conference: The State of Patent Litigation (Sept. 27, 2011).

²⁸ IBM is typically the largest recipient of U.S. patents each year, with nearly 5,900 patents in 2010 and 6180 in 2011. See Press Release, IFI CLAIMS Patent Services, IFI Announces Top Global Companies Ranked By 2011 U.S. Patents (Jan. 10, 2012), available at <http://ificlaims.com/index.php?page=news&type=view&id=ifi-announces-top>. Through 2007, IBM claimed 26,000 "active" U.S. patents and over 40,000 worldwide. See IBM, Patents Portfolio, <http://www.ibm.com/ibm/licensing/patents/portfolio.shtml>.

²⁹ To bolster its position vis-à-vis Apple and other industry leaders in the intensely competitive and litigious smartphone sector, Google acquired Motorola Mobility and its 17,000 patents for \$12.5 billion and a reported 3,400 patents from IBM. See John Ribeiro, Google acquires over 1,000 IBM patents (Sept. 14, 2011), http://www.computerworld.com/s/article/9220027/Google_acquires_over_1_000_IBM_patents; Gametime IP, Google-IBM Patent Deal: Business as Usual? (Jan. 5, 2012), <http://gametimeip.com/2012/01/05/google-ibm-patent-deal-business-as-usual>. In a related move, a consortium of IT companies including Apple and Microsoft recently acquired Nortel's portfolio of 6,000 patents for \$4.5 billion. See Press Release, Nortel Networks Corp., Nortel Announces Winning Bidder of Patent Portfolio (Jun. 30, 2011), available at <http://www.nortel-canada.com/2011/06/nortel-announces-winning-bidder-of-patent-portfolio/>.

companies are likely to own thousands of patents that are not embodied in their product offerings but which nonetheless have significant value in the marketplace. Should Motorola and IBM be treated as NPEs or PAEs for purposes of GAO's study? Is Google a PAE if it elects to enforce its newly acquired patents against a competitor's existing products?

There is little doubt that Motorola, IBM, and Google would strongly resist this or any other label that might diminish the value of their sizeable investment in the patented technologies at issue or call into question their right to enforce such patents in court. As a matter of principle, however, it is difficult if not impossible to draw a bright line between manufacturers that act as NPEs or PAEs with respect to some part of their patent portfolio and upstream innovators or licensing organizations that by virtue of their specialized business structure elect to license their patents to downstream manufacturers.

Given the complexities of our dynamic innovative economy, there is little value in attempting to define and categorize a patent owner based on its business model or commercially-driven choices as to how best to exploit its property rights. The existing, sparse empirical research on NPEs and PAEs – much of which accepts unquestioningly that litigation by NPEs or PAEs is inherently problematic – tends to gloss over these definitional challenges. GAO's study, in contrast, should acknowledge the issue head on and note at the outset that the lack of an agreed definition of NPE or PAE makes it impossible to determine which patent litigants should fall within the scope of the study or quantify the effects of such litigation.

Moreover, as discussed below, IA urges the GAO to challenge the underlying premise of the study and emphasize the potential dangers of perpetuating a mythology that threatens to harm a broad cross-section of our innovation economy.

II. Quantifying the Volume and Impact of Litigation by NPEs and PAEs

Section 34 requires the GAO to quantify the "annual volume of litigation" by NPEs and PAEs over a 20-year period, the number of cases determined to be without merit upon judicial review, the impact of such litigation on the time required to resolve patent claims, and the "costs" and broader economic effects associated with such litigation. Putting aside the definitional issues discussed above, there is insufficient empirical data to address these issues accurately and thoroughly. Even the threshold task of quantifying the volume of NPE/PAE litigation over a 20-year period is difficult and problematic based on existing research. Nevertheless, we have summarized below some of the more pertinent findings in this area. Appendix A includes a list of the relevant studies and reports, including research on small innovative firms, which would fall within broader definitions of NPEs.

PricewaterhouseCoopers (PWC) appears to have conducted the first significant study of litigation by so-called NPEs in 2009 as part of its annual review of patent litigation.³⁰ The 2009 PWC study examined the rate of patent case filings since 1991 and also attempted to assess litigation success rates, median damage awards, and other trends for suits filed by such NPEs vis-à-vis "practicing" entities. PWC's 2010 and 2011 studies have similarly focused on litigation trends with respect to NPE's,

³⁰ Chris Barry et al., PricewaterhouseCoopers, 2009 Patent Litigation Study: A Closer Look, Patent Litigation Trends and the Increasing Impact of Nonpracticing Entities (2009). Note that early PWC studies of patent litigation did not address NPEs or similar entities.

also starting with 1995 data.³¹ Significantly, however, the PWC studies do not measure the volume or percentage of cases filed by NPEs, though other studies have attempted to do so, as discussed below.

At most, the existing data suggest a relatively stable and static litigation landscape, in which (i) patent litigation rates, median damage awards, and litigation costs have largely remained constant, and (ii) NPEs have accounted for a relatively small percentage of patent infringement suits. Studies also suggest that (iii) small patent owners, on average, are responsible for a greater proportion of high value patents, (iv) small patent owners are more likely to be dependent on their patent assets and income to stay in business, and (v) when NPEs do file suit, their patents tend to be valuable and their rate of success is on par with that of practicing entities. These latter findings suggest that NPEs, by virtue of their size and licensing-based business model, may have little choice but to resort to litigation when negotiations with potential implementers reach an impasse. Moreover, when they do bring suit, their patents are, on average, more valuable than the patents litigated by practicing entities.

In short, the data on NPEs do not corroborate the rhetoric. With that said, media reports are replete with anecdotes of NPEs or PAEs that engaged in aggressive tactics to drive a settlement or whose patents were ultimately invalidated after bringing suit against multiple large defendants. Anecdotes, however, make for bad public policy and typically reflect one side of a far more complex story. The GAO cannot allow anecdotes, no matter how dramatic, to overshadow the fact that there is no evidence of an NPE-fueled litigation crisis and insufficient research to assess the effects of the small percentage of patent suits brought by NPEs.

Conversely, there is ample evidence that our economy has benefited greatly from a diverse innovation ecosystem that encourages participation by a broad spectrum of upstream innovators that specialize in R&D, downstream manufacturers that specialize in production and commercialization, and large vertically integrated companies that possess each of these capabilities. The fact that our patent laws protect the rights of all entrants, large and small, is an undeniable strength that has served our country well for more than two centuries.

- A. Patent litigation rates have remained relatively steady, despite recent significant increases in patenting activity.

Reports of a patent litigation crisis have, for more than a decade, gained widespread acceptance in the media despite extensive empirical evidence to the contrary. According to the 2011 PWC study, the number of patent actions filed since 1991 has grown at approximately the same rate as the number of patents granted by the USPTO: patent actions have grown at an annual compound rate of 4.9%,

³¹ A note of caution: when comparing the annual PWC studies from year to year, IA found inconsistent data in certain areas, which could undermine the reliability of PWC's overall findings. These inconsistencies arise in part because the studies compare data from different datasets on the US Courts statistics page: <http://www.uscourts.gov/Statistics.aspx>. Specifically, the PwC reports use data from different "year end" sets: meaning, some of the data are based on a March-March year, some of the data are based on a June-June year, and some of the data are based on a September to September year. Unfortunately, the PwC reports are not consistent as to which year-end they use.

compared to an annual compound growth rate of 4.5% for patents granted, from 1991 to 2010.³² Based on data from the USPTO and the Administrative Office of the United States Courts, IA estimates that the patent litigation rate – the number of patent lawsuits commenced divided by the number of patents issued by the USPTO each year – has remained virtually constant over the past decade (see Appendix B).³³ According to IA’s analysis, the patent litigation rate between 2001 and 2011 has hovered between a low of 1.34 percent in 2001 and a high of 1.64 percent in 2004, 2005, and 2011, with an overall average rate of approximately 1.5 percent. Significantly, the current patent litigation rate is less than half the litigation rate of 3.6 percent in the mid-nineteenth century.³⁴

In recent years, despite a significant increase in patenting activity, the number of patent cases filed has remained relatively steady or grown at a rate below the growth rate for patents issued. In 2009, while the annual number of patents granted by the USPTO continued to rise by 4.1%,³⁵ the number of patent actions filed in U.S. District Courts (2,792) dropped by 4.0% from 2008 (2,909).³⁶ In 2010, the number of patents granted by the USPTO increased by 23%, while patent actions filed increased by 18% (from 2,792 to 3,301).³⁷ Finally, though patent actions filed in 2011 increased by 21.6% (from 3,301 to 4,015),³⁸ the patent litigation rate increased by only 0.22 percentage points to 1.64% (only 0.3 percentage points above the minimum rate from 2001 to 2011).³⁹

Not surprisingly, the cost of patent litigation varies depending on the size of the potential damages claim and whether the case proceeds through discovery and trial. According to a 2011 survey by the American Intellectual Property Law Association, if the case involves \$1 million to \$25 million in potential damages, average litigation costs are approximately \$2.8 million. If more than \$25 million is at stake, average litigation costs increase to \$6 million.⁴⁰

³² Chris Barry et al., PricewaterhouseCoopers, 2011 Patent Litigation Study 8 (Oct. 2011).

³³ For data underlying IA’s calculations, see U.S. Patent and Trademark Office, Performance and Accountability Report: Fiscal Year 2011 163 tbl.6 (2011); Administrative Office of the United States Courts, Judicial Business of the United States Court: Annual Report of the Director tbl.C-2A, for the respective years.

³⁴ B. Zorina Khan, Property Rights and Patent Litigation in Early Nineteenth-Century America, 55 J. Econ. Hist. 58 (1995).

³⁵ See U.S. Patent and Trademark Office, Performance and Accountability Report: Fiscal Year 2011 163 tbl.6 (2011).

³⁶ Administrative Office of the United States Courts, Judicial Business of the United States Courts: 2009 Annual Report of the Director 146 tbl.C-2A (2010).

³⁷ See Administrative Office of the United States Courts, Judicial Business of the United States Courts: 2010 Annual Report of the Director 149 tbl.C-2A (2011).

³⁸ See Administrative Office of the United States Courts, Judicial Business of the United States Courts: 2011 Annual Report of the Director 130 tbl.C-2A (2011).

³⁹ For details on the patent litigation rate from 2001 to 2011, see Appendix B.

⁴⁰ American Intellectual Property Law Association, Report of the Economic Survey 2011 I-154 (2011).

- B. Periodic patent litigation “wars” are driven by competitors in dynamic product sectors and do not reflect a broader trend.

Periodic, highly publicized surges in patent litigation within specific industries create the appearance of a significant upswing in litigation generally, when in fact they represent a temporary phenomenon within a high-growth and intensely competitive product sector. Industry giants within these important emerging technology sectors use patent litigation as a means of strengthening their market position vis-à-vis key competitors. The so-called smartphone wars represent the latest battle of the titans, implicating a handful of large mobile device manufacturers and operating system software producers. The sheer number of parallel U.S. and foreign infringement suits filed by these same competitors fuels the perception of patent litigation run amok.⁴¹ And of course, alleged infringers have every incentive to perpetuate this perception by blaming their plight on a broken and imbalanced patent system that threatens to stand between consumers and their favorite mobile devices.

In reality, however, the smartphone cases are all part of an interrelated web of lawsuits initiated by a small subset of large incumbent competitors vying to expand their technological footprint and market share. Similar waves of patent litigation have occurred in previous periods of intense technological development, including in the 19th century with the so-called telephone and sewing machine wars. The 21st century smartphone litigation pales in comparison with the late nineteenth century telephone wars, which pitted Alexander Graham Bell’s American Bell Telephone company (the predecessor to AT&T) against competing inventor Elisha Gray and his Western Electric company. The number of patent lawsuits related to the smartphone business is nearly 100.⁴² The American Bell Telephone Company litigated nearly 6 times as many court cases related to its patents, five of which went to the U.S. Supreme Court.

The first commercially successful sewing machine also sparked a flurry of lawsuits, implicating numerous inventors of complementary technologies, most notably Elias Howe and Isaac Singer. The ensuing sewing machine war was ultimately resolved when the four principal patentees agreed to pool their patents and enter into cross-licenses, which allowed each to compete in the marketplace without the threat of litigation.⁴³ We may well see a similar, commercially-driven resolution to the smartphone wars without any need for government intervention or inconvenience to mobile phone users. In fact, the enormous volume of recent patent acquisitions within the smartphone sector may suggest that a cease fire is imminent.⁴⁴

⁴¹ For useful (albeit unofficial) graphical depictions of the various U.S. and foreign fronts of the smartphone wars, see: <http://blogs-images.forbes.com/adamthierer/files/2012/04/smartphone-patent-wars.jpg>; http://fs01.androidpit.info/userfiles/67101/image/AndroidPIT_EN_Patent_War_960_wide.jpg.

⁴² See Nick Wingfield, U.S. Backs Apple in a Patent Ruling that Hits Google, N.Y. Times, Dec. 20, 2011, at A1.

⁴³ See Adam Mossoff, The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s, 53 Ariz. L. Rev. 165 (2011).

⁴⁴ For useful (albeit unofficial) graphical depictions of the various U.S. and foreign fronts of the smartphone wars, see: <http://blogs-images.forbes.com/adamthierer/files/2012/04/smartphone-patent-wars.jpg>; http://fs01.androidpit.info/userfiles/67101/image/AndroidPIT_EN_Patent_War_960_wide.jpg. (continued...)

C. NPEs account for a small percentage of patent infringement cases filed in court.

Although the definitional issues noted above limit the reliability of any research in this area, existing studies have uniformly shown that NPEs, no matter how defined, file a relatively small fraction of all infringement suits in federal court.⁴⁵ For example, one study concluded that NPEs brought only 17% of “high-tech” patent lawsuits from 2000-2008.⁴⁶ Another found that only 3% of plaintiffs in patent litigation in 2000 and 2002 were patent licensing firms, and only 15% of patent litigation involved small plaintiffs and large defendants.⁴⁷ Considering that small, innovative firms account for approximately 40% of firms that own 15 or more patents,⁴⁸ the rate of litigation initiated by parties described as NPEs is relatively modest.

D. When NPEs and other small innovative firms litigate, they often do so to enforce valuable patents.

Some studies have emphasized that even if NPEs are not litigious as a group, patents owned by certain NPEs appear to be among the most litigated patents.⁴⁹ However, these and other studies also indicate that small innovative firms (the majority of which would constitute NPEs) tend to rely more heavily on patents to protect their inventions, and that patents owned by NPEs and other small firms are, on average, more valuable.⁵⁰ Traditional patent quality measures – for example, the number of claims with respect to a patent and the number of citations that patent has received – indicate that NPE-

⁴⁵ Michael Risch, Patent Troll Myths, 42 Seton Hall L. Rev. (forthcoming 2012) (manuscript at 9-10).

⁴⁶ 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, 1600 (2009).

⁴⁷ Gwendolyn G. Ball & Jay P. Kesan, Transaction Costs and Trolls: Strategic Behavior by Individual Inventors, Small Firms and Entrepreneurs in Patent Litigation 15, 18 (U. Ill. L. & Econ., Working Research Paper Series No. LE09-005, 2009). Note, however, that one 2011 study suggests that the number and percentage of suits by NPEs may be considerably higher in the Eastern District of Texas. In particular, in 2010, 51% of patent infringement lawsuits in that court were brought by NPEs (not including universities). In total, 392 patents were asserted in these infringement lawsuits, 248 of which were asserted by NPEs (approximately 63.5%). See Peter V. Stern & Timothy G. Doyle, Trends and Developments Regarding Nonpracticing Entities in the U.S., 61 Chizai Kanri 445 (2011).

⁴⁸ Anthony Breitzman & Diana Hicks, Small Bus. Admin., Office of Advocacy, An Analysis of Small Business Patents by Industry and Firm Size 5 (2008).

⁴⁹ Michael Risch, Patent Troll Myths, 42 Seton Hall L. Rev. (forthcoming 2012) (manuscript at 9 n.29).

⁵⁰ See, e.g., Michael Risch, Patent Troll Myths, 42 Seton Hall L. Rev. (forthcoming 2012) (manuscript at 22-23) (comparing indicia of quality in litigated patents across various studies); Anthony Breitzman & Diana Hicks, Small Bus. Admin., Office of Advocacy, An Analysis of Small Business Patents by Industry and Firm Size iii (2008). Note that Breitzman and Hicks’s analysis focuses on patenting activities by small firms (rather than on NPEs).

litigated patents are of equal or higher quality compared to patents litigated by other plaintiffs.⁵¹ These findings rebut a central premise of the NPE mythology, namely that NPEs, as a group, use litigation to “extort” excessive settlements or jury verdicts for “poor quality” patents.

E. Litigation success rates for NPEs are comparable to those of practicing entities.

The literature shows that when startups and other NPEs bring suit to enforce their patents, their “success” rates are comparable to those of other patent owners. At the same time, litigation outcomes for both practicing and non-practicing entities vary significantly from industry to industry.⁵² One study found that NPE-litigated patents were invalidated in 28% of cases examined, compared with 20% for other litigated patents.⁵³ Another shows an even lower invalidity rate of 16% for a sample of NPE-litigated patents.⁵⁴

Moreover, after examining patent lawsuit decisions from 1995-2010, the 2011 PWC study concluded that NPEs and practicing entities have identical success rates at trial.⁵⁵ When comparing NPE and practicing entity success rates year-by-year from 2001-2010, the study found that success rates were quite volatile. For instance, from 2004-2007 and again in 2010, the success rates of practicing entities exceeded those of NPEs, sometimes by a very large margin. In other years, NPEs had higher success rates. This volatility suggests that any one snapshot of NPE success rates – whether based on anecdote or a narrow time period – is not indicative of a larger trend.⁵⁶

F. NPEs appear to achieve higher damage awards than practicing entities, but the data vary significantly by industry.

PwC’s 2011 study found that the annual median damages award between 1995 and 2010 has ranged from \$1.8 million to \$10.5 million, with an overall median award of \$5.1 million. The study found a slight downward trend in damages since 1999 and noted that the 2010 median award of \$1.8 million represents an historical low for the 16 year period under review.⁵⁷ Between 2006 and 2010, the median damage award for NPEs was more than double the median for practicing entities.⁵⁸ However,

⁵¹ Michael Risch, Patent Troll Myths, 42 Seton Hall L. Rev. (forthcoming 2012) (manuscript at 22-23) (comparing indicia of quality in litigated patents across various studies).

⁵² Chris Barry et al., PricewaterhouseCoopers, 2011 Patent Litigation Study 24 (2011).

⁵³ Michael Risch, Patent Troll Myths, 42 Seton Hall L. Rev. (forthcoming 2012) (manuscript at 24-25).

⁵⁴ Sannu K. Shrestha, Trolls or Market-Makers? An Empirical Analysis of Nonpracticing Entities, 110 Colum. L. Rev. 114, 158 (2010).

⁵⁵ The PWC Study also found that the difference between success at summary judgment as opposed to success at trial is 7 percentage points, which makes the overall success rate difference between NPEs and others roughly 10%. Chris Barry et al., PricewaterhouseCoopers, 2011 Patent Litigation Study 16-17 (2011). The relevance of this difference in summary judgment success rates is unclear.

⁵⁶ Id. at 17.

⁵⁷ Id. at 9.

⁵⁸ Id.

when the data are parsed on an industry basis, it is difficult to discern any meaningful trends. The volume of litigation, success rates, and median awards vary significantly from industry to industry.

- G. NPEs are more dependent on patent income and have less leverage to encourage settlement over litigation.

For startups and other small innovative firms, the existence of an enforceable, exclusive patent is often essential to secure the private capital financing necessary to fund a lengthy development process. Experts often refer to this dynamic as the “signaling” role of patents – i.e., patents signal to the market information about the startup’s value and potential profitability and thus facilitate venture capital investment and possible acquisition by a larger entity.⁵⁹ A U.S. patent instills confidence that new discoveries can be protected against theft during a multi-year development phase and ultimately licensed or sold to an established company should that discovery culminate in a marketable product.

In that regard, studies also show that startups invest in patents primarily as a means of preventing unlawful copying of their inventions.⁶⁰ Small innovative firms may have little choice but to bring suit when implementers refuse to negotiate a license, particularly if the firm’s valuable patents are its primary assets and source of revenue or private capital financing. In contrast, large manufacturers are typically not dependent on patent royalties to drive revenues and instead amass patents for defensive purposes – e.g., to preserve market share and fend off patent suits by other large competitors in the market. As a result, large firms are more likely to settle patent disputes through cross-licensing – i.e., where competitors enter into an exchange of patent rights – or other extra-judicial agreements and can credibly threaten injunctive relief to incentivize settlement.

Patent-dependent NPEs typically do not have these types of “bargaining chips” to promote settlement. Royalty-based licenses are essential to survival, and there is typically no need to license the other company’s patents since the NPE has no products infringing such patents. Thus, a cross-license is not a viable option to resolve an infringement claim.⁶¹ Moreover, following the Supreme Court’s decision in *eBay v. MercExchange*, it is more difficult for a patent owner to obtain injunctive relief in court unless it manufactures a product and competes directly with the infringer.⁶² Thus, small

⁵⁹ See, e.g., Ted Sichelman and Stuart J.H. Graham, *Patenting by Entrepreneurs: An Empirical Study*, 17 Mich. Telecom. Tech. L. Rev. 111, 115 (2010) (reporting and analyzing findings from the 2008 Kauffman-Berkeley Survey on Entrepreneurial Companies and the Patent System, which surveyed 15,000 startups in different industry sectors). See also Stuart J.H. Graham, Robert P. Merges, Pam Samuelson & Ted Sichelman, *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 Berkeley Tech. L.J. 1255 (2010)

⁶⁰ *Id.* at 114.

⁶¹ See Gwendolyn G. Ball & Jay P. Kesan, *Transaction Costs and Trolls: Strategic Behavior by Individual Inventors, Small Firms and Entrepreneurs in Patent Litigation 7* (U. Ill. L. & Econ., Working Research Paper Series No. LE09-005, 2009).

⁶² *eBay Inc. v. MercExchange LLC*, 547 U.S. 388 (2006). In *eBay*, the Supreme Court rejected “categorical rules” favoring or disfavoring permanent injunctive relief following a nonappealable judgment of infringement. In all cases, courts must retain equitable discretion to consider the merits of a request for permanent injunctive relief based on the traditional “four factor” test. Lower courts have interpreted (continued...)

innovative firms are less able to leverage the threat of injunctive relief to encourage settlement. When licensing negotiations break down, these small patent owners may have little choice but to seek compensatory damages in court.

Critics of the patent system argue that NPEs and PAEs are inherently problematic because large infringers cannot avoid liability through a cross-license. These commentators suggest that royalty-based settlements and damages are an innovation “tax” on infringing manufacturers that could otherwise invest these payments in research and development.⁶³ This argument is frankly difficult to understand and seems to ignore the anti-innovation and anti-competitive effects of continued infringement on the small innovators that help drive technological development in the United States.

The fact that small patent owners can reasonably rely upon the judicial system to enforce their rights against established manufacturers is a unique strength of the U.S. patent system, and one that historically has helped strengthen America’s innovation economy. As noted by economist Zorina Khan, “[t]he United States created the world’s first modern patent system, and its effectiveness was reinforced by a federal judiciary that ensured property rights were secure and inventors were able to appropriate the returns from their efforts.”⁶⁴ Khan characterizes America’s revolutionary approach to patents as the “democratization of invention,” in which our Constitution, laws, and courts “served to encourage ordinary citizens to invest in creating new discoveries.”⁶⁵

H. Litigation is often a last resort for startup NPEs attempting to enforce their rights.

At the same time, however, the prospect of litigation is daunting for many small innovation specialists and a costly and unwelcome diversion of scarce resources. The myth that innovative NPEs are eagerly racing to the court house has no basis in fact and runs directly counter to how most startups think and operate. The day-to-day existence of entrepreneurial firms is literally a race against insolvency. Startups face a high probability of bankruptcy before generating a steady stream of revenue — hence the term “valley of death” to describe the perilous period before a small firm achieves commercial viability.⁶⁶ For patent-dependent NPEs, litigation may be the only means of surviving the valley when implementers refuse to settle. Patent litigation is typically viewed as a last resort to recoup a firm’s sizeable investment in a lengthy research and development process.

eBay as eliminating the presumption of irreparable harm that historically followed a nonappealable judgment that a patent is not invalid, enforceable and infringed. Moreover, some courts have refused to grant injunctive relief (whether permanent or preliminary) unless the patent owner manufactures a product, and the alleged infringer is a competitor. As a result, despite the Supreme Court’s clear rejection of categorical rules, certain courts now disfavor injunctions for broad categories of non-manufacturing patent holders

⁶³ See, e.g., James Bessen, Jennifer Ford, and Michael J. Meurer, *The Private and Social Costs of Patent Trolls* (Boston Univ. School of Law Working Paper, 2011) (funded in part by the Coalition for Patent Fairness).

⁶⁴ B. Zorina Khan, *Technological Innovation and Endogenous Changes in U.S. Legal Institutions, 1790-1920*, National Bureau of Economic Research 9 (Working Paper 10346, 2004).

⁶⁵ *Id.* at 6.

⁶⁶ See e.g., <http://smallbiztrends.com/2011/09/why-do-most-start-ups-fail.html>.

- I. Although the percentage of complaints filed by NPEs at the International Trade Commission has marginally increased, the number of complaints accepted by the Commission is very low.

Much of the recent media coverage of patent litigation has focused on the International Trade Commission's "section 337" authority to bar the importation of articles that infringe U.S. intellectual property rights, including patents.⁶⁷ In significant part, this is because the ITC has become an important battleground in the smartphone arena. However, academic and industry critics of the patent system also charge that the ITC is unduly tolerant of NPEs and PAEs and too willing to grant so-called exclusion orders in cases where a court might otherwise deny injunctive relief. Certain studies point to an apparent spike in NPE/PAE filings at the ITC as evidence that reforms are needed to limit their access to the Commission.

Here again, the evidence does not match the rhetoric. Patent-related ITC cases have increased in recent years, but the total number - approximately 70 in 2011 - is tiny compared with the 4000+ patent cases filed in federal district courts. With numbers this small, an annual increase of 20 or even 10 cases can seem statistically dramatic. Nevertheless, a recent paper by Professors Colleen Chien and Mark Lemley suggests that NPEs and PAEs are "flocking" to the ITC.⁶⁸ According to the authors, this is because the ITC continues to grant injunctions "as a matter of course" to non-practicing entities. In contrast, federal courts are less likely to grant injunctive relief to NPEs and PAEs in the wake of the Supreme Court's 2006 decision in *eBay v. MercExchange*.⁶⁹

Without offering a clear definition of NPE, Chien and Lemley assert that NPE cases at the ITC have increased from 2 in 2006 to 16 in 2011, representing a statistical increase from 7 percent to 25 percent. Of the 16 so-called NPE cases at the ITC, the authors provide no analysis as to the nature of the patent owner, including whether it invests in innovative activity. They also fail to address the fact that large manufacturers remain the primary drivers of ITC litigation. Of the 70 complaints brought under section 337 in 2011, more than one-third (i.e., 27 complaints) were filed by the same 11 large companies, including major players in the smartphone litigation. Many of these same companies were respondents in other ITC cases. In other words, while more NPEs may be using the ITC, large manufacturers are "flocking" to the ITC in greater numbers and doing so to sue industry competitors for market advantage -- i.e., the same trend that we see in federal courts.

Aside from its empirical deficiencies, the Chien/Lemley paper appears to misunderstand or ignore the unique statutory mandate and remedial powers of the ITC and the multitude of factors that have increased the volume of section 337 litigation. Unlike federal courts, the ITC is a specialized forum, created by Congress, for the adjudication of unfair acts in import trade. For several decades, the ITC's statutory mandate has included unfair imports of foreign-manufactured products that violate a U.S.

⁶⁷ The ITC's enforcement authority derives from section 337 of the Tariff Act, 19 U.S.C. §1337.

⁶⁸ Colleen V. Chien & Mark A. Lemley, Patent Holdup, the ITC, and the Public Interest (2012), <http://ssrn.com/abstract=2022168>.

⁶⁹ *eBay Inc. v. MercExchange LLC*, 547 U.S. 388 (2006).

patent.⁷⁰ However, its mission and remedies with respect to patent infringement are quite different from that of the judiciary.

The ITC's enforcement authority is limited to situations where a patent owner's "domestic industry" is harmed by infringing imports manufactured abroad. The ITC's mission is to exclude the infringing imports from entering U.S. borders, not to resolve commercial disputes. Toward that end, its jurisdiction is limited to the products themselves, i.e., it has no personal jurisdiction over the infringer. Moreover, the ITC's sole statutory remedy is its authority to exclude, either through the issuance of an exclusion order or cease and desist order. An exclusion order directs U.S. customs to bar the importation of unfair products into the United States. Importantly, the ITC has no authority to award monetary damages or other common law remedies.

For the first 40 years of its existence, the ITC was a seldom used forum for patent infringement suits. In recent decades, however, the ITC has become a more popular venue for patent owners, with new section 337 investigations reaching an historical high of 70 in FY 2011. This trend is due to a range of factors, including 1988 amendments to section 337 that made it possible for patent owners to establish a domestic industry based on a "significant investment" in the patent's exploitation, including engineering, R&D, and/or licensing activity in the United States.⁷¹ The ITC is also widely perceived as a far more efficient forum for enforcing patents, due to its expedited process and technically expert corps of administrative law judges.

Another factor is the changing nature of manufacturing, particularly within patent-intensive sectors. Because many large U.S. companies have moved their manufacturing operations overseas, U.S. and foreign competitors alike can now launch investigations against one another at the ITC to potentially halt imports. An exclusion order is an unquestionably powerful remedy. And when combined with the ITC's expedited litigation process, a manufacturer can wield a very big stick by suing competitors for patent infringement at the ITC. This is evident from the ITC smartphone complaints brought by Apple, Samsung, Google, and others.

The uptick in ITC litigation may also be due in part to the Supreme Court's decision in *eBay v. MercExchange*,⁷² which made it harder for non-manufacturing patent owners to obtain injunctive relief

⁷⁰ The roots of Section 337 lie in section 316 of the Tariff Act of 1922.⁷⁰ Section 316 empowered the Tariff Commission to investigate unfair competition complaints and to make recommendations to the President.⁷⁰ When unfair competition was found, the President had statutory authority either to increase the tax on violative articles or to ban the articles' importation.⁷⁰ Thus, from its inception, Section 337 was focused on unfair competition and was intended to protect American innovation and industry through the nation's trade laws. The Tariff Act of 1930, Pub.L. No. 71-361, 46 Stat. 590, created Section 337 by incorporating much of section 316, although it eliminated the President's power to increase taxes on violative articles.⁷⁰ Congress also eliminated the monetary remedy for import violations, ensuring that the President's exclusion power was the sole available remedy for violations of Section 337.

⁷¹ See 19 U.S.C. §1337(a)(3)(C).

⁷² *eBay Inc. v. MercExchange LLC*, 547 U.S. 388 (2006). In *eBay*, the Supreme Court rejected "categorical rules" favoring or disfavoring permanent injunctive relief following a nonappealable judgment of (continued...)

in court. In *eBay*, the Court reaffirmed a court's equitable discretion to issue injunctive relief and eliminated the presumption of irreparable harm that used to follow a final infringement verdict. Without this presumption, courts have proven less willing to grant injunctive relief where a patent owner does not compete with the infringer.

Significantly, because the Supreme Court's decision in *eBay* dealt exclusively with a federal court's equitable discretion to grant injunctions, it does not impact the ITC's authority to issue exclusion orders. Although Chien/Lemley and other ITC reform advocates tend to treat exclusion orders as injunctions by a different name, the ITC's remedial authority is, in fact, qualitatively different in origin, nature, scope, and purpose than an injunction.⁷³

Regardless, there is no empirical evidence to support the Chien/Lemley thesis that NPEs and PAEs are flooding the ITC to avoid application of *eBay*'s equitable test. And without that support, their policy recommendations – that the ITC should deny or delay relief to NPEs and PAEs – are equally unfounded. Aside from the fact that NPEs (however they are defined) represent a relatively small percentage of the section 337 cases filed at the ITC, the impact of *eBay* is not at all clear. In fact, the Chien/Lemley paper acknowledges that innovative NPEs continue to fare well in obtaining injunctive relief in court. The paper notes that PAEs are far less likely to succeed, but true assertion entities (i.e., entities that lack a licensing or R&D function) are even less likely to satisfy the ITC's domestic industry requirement.

To avail itself of the ITC's enforcement authority, a non-manufacturing patent owner must demonstrate a "substantial investment" in exploiting the patent, either through engineering, R&D, or licensing. The ITC has conclusively held that investments in litigation are, without more, insufficient to satisfy the domestic industry test.⁷⁴ This limitation on ITC jurisdiction begs the question of whether any ITC complainants are appropriately categorized as PAEs as defined by the FTC.

infringement. In all cases, courts must retain equitable discretion to consider the merits of a request for permanent injunctive relief based on the traditional "four factor" test. Lower courts have interpreted *eBay* as eliminating the presumption of irreparable harm that historically followed a nonappealable judgment that a patent is not invalid, enforceable and infringed. Moreover, some courts have refused to grant injunctive relief (whether permanent or preliminary) unless the patent owner manufactures a product, and the alleged infringer is a competitor. As a result, despite the Supreme Court's clear rejection of categorical rules, certain courts now disfavor injunctions for broad categories of non-manufacturing patent holders.

⁷³ In *Spanson, Inc. v. International Trade Com'n*, 629 F.3d 1331 (Fed. Cir. 2010), the Federal Circuit held that the ITC was not required to apply the traditional four-factor test for injunctive relief used by the federal courts. Given "the longstanding principle that importation is treated differently than domestic activity" and the different statutory underpinnings for relief before the ITC in Section 337 actions and before the federal courts in suits for patent infringement, the Federal Circuit held that *eBay* does not apply to ITC remedy determinations under Section 337.

⁷⁴ See, e.g., *Certain Coaxial Cable Connectors and Components Thereof and Products Containing the Same*, Inv. No. 337-TA-650 (2011) (holding that litigation expenses were insufficient to establish a domestic industry).

Finally, the Chien/Lemley thesis holds water only if *eBay* has prompted an equally dramatic exodus of NPEs from the courts. If NPEs are flocking to the ITC to avoid *eBay*, one would expect to see significant decreases in court actions by NPEs. Moreover, if *eBay* solved the “NPE problem” at the judiciary, it is unclear why critics continue to blame NPEs for a broader patent litigation crisis. In reality, the overall percentage of court actions by NPEs has remained relatively constant over the past decade and modest as an overall proportion of patent litigation cases. Nevertheless, NPE critics seem oblivious to the fundamental inconsistency of their positions.

III. The Importance of Innovative NPEs to Technological Development, Competition, and Job Growth

The final question for consideration under Section 34 acknowledges the potential “benefits” of NPEs and PAEs “to commerce,” but it does so in a manner that regrettably downplays and even questions whether such benefits exist. Regardless, we would encourage the GAO to give serious attention to this aspect of the study, which — unlike other parts of the study — is backed by ample empirical data.

A broad definition of NPEs would encompass virtually all of the small entrepreneurial firms, universities, research institutions, and technology licensing businesses that dominate early stage innovation, technology transfer, and job creation in this country. It is impossible to overstate the importance of this cross-section of patent owners to U.S. commerce and economic growth.

- A. IP-based firms and licensing revenue are key drivers of export growth, which in turn creates new jobs.

For more than two centuries, strong patent rights have successfully incentivized investments in innovation, a key historical driver of economic growth in this country. According to the U.S. Department of Commerce, technological innovation has accounted for approximately three-quarters of the United States’ average annual economic growth since the mid-1940s.⁷⁵ Today, the U.S. economy is more dependent than ever on IP-fueled innovation. America’s preeminence in research and innovation is widely regarded as our key comparative advantage in an increasing competitive global market. Investments in “game-changing” innovation form the centerpiece of the Administration’s Global Development Policy and are expected to drive “development goals in health, food security, climate change, energy and environmental sustainability, and broad-based economic growth.”⁷⁶ In short, our economic future — and the health of our global economy — is inextricably tied to the continued vitality of America’s innovative ecosystem.

According to a report published in March 2012 by the U.S. Department of Commerce, America’s most IP-intensive industries (as identified in the report) generated direct employment of 27.1 million jobs in 2010 and an additional 12.9 million jobs through indirect activities associated with these

⁷⁵ Arti Rai, Stuart Graham, Mark Doms, Patent Reform: Unleashing Innovation, Promoting Economic Growth, & Producing High-Paying Jobs, U.S. Department of Commerce White Paper 2 (April 13, 2010).

⁷⁶ Press Release, The White House, Fact Sheet: Harnessing Innovation for Global Development (Feb. 8, 2012), available at <http://www.whitehouse.gov/the-press-office/2012/02/08/fact-sheet-harnessing-innovation-global-development>.

industries. In total, these 40 million jobs represent 27.7 percent of all jobs in the U.S. economy. In 2010 these IP-intensive industries accounted for \$5.06 trillion in value added, or 34.8 percent of U.S. gross domestic product.⁷⁷

From 2000-2007, IP-intensive industries made up nearly half of output and sales of all U.S. tradable industries.⁷⁸ During this period, IP-intensive industries accounted for approximately 60 percent of total U.S. exports, increasing from \$665 billion in 2000 to \$910 billion in 2007.⁷⁹ The export value of U.S. intellectual property derives, in significant part, from its ability to drive technology transfer in foreign markets, primarily in the form of licensing transactions. From 2005 to 2009, the United States received an average of \$80 billion per year in cross-border license fees and royalties for the use of U.S. intellectual property.⁸⁰ Royalty and license fees exceeded \$106 billion in 2010 and \$120 billion in 2011, contributing \$72 billion and \$84 billion to the trade surplus for each year.⁸¹ While the U.S. struggles to maintain a manufacturing base in the global economy, the continued growth of our IP-based licensing sector remains a consistent bright spot in an otherwise challenging economic recovery.

- B. Startups, including small innovative firms, are responsible for a significant percentage of new jobs.

The strength of the U.S. licensing sector stems from the diversity of its participants, ranging from early stage innovation specialists – research firms, universities, and startups – to vertically integrated manufacturers with extensive IP portfolios. So-called NPEs exist throughout this spectrum and encompass a large percentage of America’s most productive innovators.

Non-manufacturing inventors are not a new phenomenon and historically have played an important role in driving technological development. Non-manufacturing inventors—especially independent inventors—were critical to the growth of American industry during the mid-nineteenth to early twentieth centuries. Of the particularly productive inventors of this period, roughly two-thirds extracted returns from their inventions not by commercializing them, but from assigning or licensing

⁷⁷ Intellectual Property and the U.S. Economy: Industries in Focus, U.S. Department of Commerce vi-vii (March 2012); see also Robert J. Shapiro & Kevin A. Hassett, *The Economic Value of Intellectual Property* 13-14 (2005).

⁷⁸ Nam D. Pham, NDP Consulting, *The Impact of Innovation and the Role of Intellectual Property Rights on U.S. Productivity, Competitiveness, Jobs, Wages, and Exports* 5, 29 (2010).

⁷⁹ Nam D. Pham, NDP Consulting, *The Impact of Innovation and the Role of Intellectual Property Rights on U.S. Productivity, Competitiveness, Jobs, Wages, and Exports* 25 (2010).

⁸⁰ Press Release, U.S. Census Bureau & U.S. Bureau of Economic Analysis, *U.S. International Trade in Goods and Services Annual Revision for 2009* 2 Ex. 2 (Jun. 10, 2010); Press Release, U.S. Census Bureau & U.S. Bureau of Economic Analysis, *U.S. International Trade in Goods and Services Annual Revision for 2007* 2 Ex. 2 (Jun. 10, 2008).

⁸¹ Press Release, U.S. Census Bureau & U.S. Bureau of Economic Analysis, *U.S. International Trade in Goods and Services* December 2011 3 Exs. 3-4 (Feb. 10, 2012).

their patents. Inventors who received 20 or more patents over their careers assigned the rights to nearly 60 percent of the patents they received.⁸²

In recent decades, the United States has transitioned to an IP-intensive model of economic growth, where all industry sectors are reliant on diversification, specialization, and technological collaboration. Although certain IP skeptics like to argue that patents are antithetical to innovation, at least in certain IT sectors, there is compelling evidence that patents are instead the linchpin of a highly creative and productive system that encourages broad participation by large and small entities alike.⁸³

Economists have long recognized that small businesses are the primary driver of net new job creation.⁸⁴ According to a recent study, however, small startup firms are the true engine of new employment growth in this country, not small businesses generally. Between 1977 and 2005, these young entrepreneurial firms created 3 million jobs annually in their first year – more than four times the number of jobs created by any other yearly age group.⁸⁵ Startups experience a high state of volatility during their early years, generating new jobs at a significant rate but also failing in large numbers in the first five and ten years of existence.⁸⁶ Nevertheless, the annual net job gain for startups is positive.⁸⁷ The small entrepreneurial firms that survive the precarious early years of existence grow more rapidly than their mature counterparts, and these new jobs are highly durable and important to the overall economy.⁸⁸

⁸² B. Zorina Khan & Kenneth L. Sokoloff, *Intellectual Property Institutions in the United States: Early Development and Comparative Perspective* 6 (2000).

⁸³ See, e.g., *id.* at 3; F. Scott Kieff, *A Keiretsu Approach to Patents*, *Intellectual Asset Management Magazine*, Feb./Mar. 2007.

⁸⁴ See, e.g., Brian Headd, *Small Bus. Admin.*, Office of Advocacy, *An Analysis of Small Business and Jobs 4-5, 9* (March 2010) (reporting that small businesses have accounted for approximately 65 percent of private sector net job creation over the past 15 years). Note that estimates as to the actual rate of new job creation by small businesses vary depending on a range of statistical and measurement issues. Nevertheless, recent research confirms the overarching thesis that small businesses, and in particular startups, are critical to U.S. employment growth. See John C. Haltiwanger, Ron S. Jarmin, & Javier Miranda, *National Bureau of Economic Research, Who Creates Jobs? Small vs. Large vs. Young 30* (Working Paper 16300, Aug. 2010)

⁸⁵ Tim Kane, *Kauffman Foundation, The Importance of Startups in Job Creation and Job Destruction 4* (2010).

⁸⁶ See Michael Horrell and Robert Litan, *Kauffmann Foundation, After Inception: How Enduring is Job Creation by Startups 4-6* (July 2010) (finding that jobs losses due to startup failures are more than offset by job growth in surviving firms).

⁸⁷ *Id.*

⁸⁸ See John C. Haltiwanger, Ron S. Jarmin, & Javier Miranda, *National Bureau of Economic Research, Who Creates Jobs? Small vs. Large vs. Young 30* (Working Paper 16300, Aug. 2010); Michael Horrell and Robert Litan, *Kauffmann Foundation, After Inception: How Enduring is Job Creation by Startups 4-6* (July 2010) (finding that jobs losses due to startup failures are more than offset by job growth in surviving firms).

- C. Small innovative firms are responsible for a significant percentage of technologically important patents.

These findings underscore the critical importance of public policy initiatives that support startup formation and survival.⁸⁹ For many small innovative firms, patent rights are an important means of survival – helping to secure investment and fend off theft – and a critical source of future revenue. Small innovative firms with fewer than 25 employees (most of which would fall within a broad definition of NPEs) produce the greatest number of patents per employee.⁹⁰ Small firms with fewer than 500 employees patent at a rate that is 16 times higher than large innovative firms.⁹¹ In addition, small firm patents outperform large firm patents on a number of impact metrics including growth, citation impact, and patent originality, suggesting that the patents of small firms in general are likely to be more technologically important.⁹²

Small innovative firms also account for nearly one-quarter of U.S.-held patents in emerging technologies, including “game-changing” health and alternative energy fields highlighted in the Administration’s Global Development agenda.⁹³ In particular, small firms account for a disproportionate amount of “green” technology patents – for example, small firms hold 32 percent of green patents in smart grids and solar energy.⁹⁴ Overall, small firms are much more likely than large firms to develop “disruptive” technologies – i.e., new technologies that displace established technologies and in turn create new markets. In contrast, larger firms are more likely to focus on incremental improvements to existing technologies and product lines.⁹⁵

- D. Patent-fueled technology transfer is at the forefront of new industry creation.

A cornerstone of America’s entrepreneurial ecosystem is university-driven technology transfer, which facilitates collaboration throughout the innovative spectrum. University and other technology transfer organizations license their patented inventions to startups and more established companies,

⁸⁹ Tim Kane, Kauffman Foundation, *The Importance of Startups in Job Creation and Job Destruction* 6 (2010).

⁹⁰ Anthony Breitzman & Diana Hicks, *Small Bus. Admin., Office of Advocacy, An Analysis of Small Business Patents by Industry and Firm Size* iii, 5-6 (2008).

⁹¹ Anthony Breitzman & Patrick Thomas, *Small Bus. Admin., Office of Advocacy, Analysis of Small Business Innovation in Green Technologies* 11 (2011).

⁹² Anthony Breitzman & Diana Hicks, *Small Bus. Admin., Office of Advocacy, An Analysis of Small Business Patents by Industry and Firm Size* iii, 8 (2008).

⁹³ *Id.* at v, 23.

⁹⁴ Anthony Breitzman & Patrick Thomas, *Small Bus. Admin., Office of Advocacy, Analysis of Small Business Innovation in Green Technologies* 20, 44 (2011).

⁹⁵ Anthony Breitzman & Diana Hicks, *Small Bus. Admin., Office of Advocacy, An Analysis of Small Business Patents by Industry and Firm Size* v (2008).

with the ultimate aim of promoting the kind of disruptive technological development needed to create new industries and long-term job growth. Prior to commercialization, technology transfer is critically dependent on a range of early stage innovators.

Major research universities like the Massachusetts Institute of Technology (“MIT”) are at the forefront of technology transfer in advanced manufacturing, clean energy, and other areas critical to America’s economic future. Following a 2009 tour of MIT’s labs, the President remarked that MIT’s clean-energy research was “a reminder that all of you are heirs to a legacy of innovation, not just here but across America, that has improved our health and our wellbeing and helped us achieve unparalleled prosperity.”⁹⁶

A 2009 study by the Kaufmann Foundation concluded that MIT alumni companies employ over 3 million people worldwide and generate almost \$2 trillion in annual world revenues.⁹⁷ Many MIT alumni companies are at the cutting edge of high technology, and a significant percentage are helping to jump-start America’s struggling manufacturing base. Technology transfer allows research universities and other innovation specialists to make effective use of inventions that might otherwise never see the light of day.

- E. Patents facilitate pro-competitive collaboration between upstream specialists and downstream manufacturers.

Experts agree that a healthy innovative ecosystem and a productive economy require collaboration across a broad range of participants — often described as a networking effect.⁹⁸ Strong patents incentivize, strengthen, and reward innovative networks whether in the form of scientific discourse, license agreements, strategic alliances, acquisitions, or private capital investments.

When patents are held by “upstream specialists” in innovation – that is, firms or individuals that hold patents but do not commercialize them – a number of pro-competitive effects can result. The patents held by these “upstream” specialists assist the entry of more specialists into a market in the first place, which has direct implications for the level of competition and therefore the prices that consumers pay. In addition, specialization can mean higher quality. Finally, innovation specialization can translate into more innovation, as rival firms are pushed to innovate in order to remain competitive in the market.⁹⁹

⁹⁶ <http://www.whitehouse.gov/the-press-office/remarks-president-challenging-americans-lead-global-economy-clean-energy>

⁹⁷ Edward B. Roberts & Charles Eesley, MIT Sloan School of Management/Kauffman Foundation, *Entrepreneurial Impact: The Role of MIT* (2009).

⁹⁸ See, e.g., Steven Johnson, *Where Good Ideas Come From: The Natural History of Innovation* (2010); Richard Ogle, *Smart World: Breakthrough Creativity and the New Science of Ideas* (2007); Eric D. Beinhocker, *The Origin of Wealth* 141-59 (2006).

⁹⁹ See Damien Gerardin et al., *Elves or Trolls? The Role of Non-Practicing Patent Owners in the Innovation Economy* 3 (Tilburg Law and Economics Center (TILEC) Discussion Paper No. 2008-018, May 2008).

At the 2006 House Hearings, American inventor Dean Kamen served as a compelling example of the pro-competitive effects of specialization and the critical role of patents in driving efficient collaboration between upstream innovators and much-larger downstream manufacturers. As noted in his testimony below, Mr. Kamen began his career as the quintessential independent inventor, but out of necessity grew into a small, vertically integrated manufacturer to commercialize his patented technology. He ultimately sold his manufacturing business in order to specialize in what he does best – invention. His R&D firm has since become a fertile source of ground-breaking innovative technologies, yielding the prototypes for medical devices, water purification systems, robotic prosthetic limbs, and the Segway (an electric, self-balancing transporter) –

I've had two kinds of business models in my life, and I only recently found out after reading the definition of a troll that I am one. So I would like to explain to you what my business was and what it is and why I think it is maybe a little unfair and dangerous to characterize people that license products as trolls.

So my first business I started when I was in high school. My older brother was in medical school . . . [and would] complain about the fact that equipment didn't exist for treating very, very small babies, neonates, that he was trying to develop cures for their cancers. I built them little pumps over the next couple of years. . . .

[I]t took about 6 years to build a whole business by which I was designing, building, testing, manufacturing, and then delivering these things. I had to build a whole sales organization, and it worked, and we had a successful little business. We sold that business to a giant company for a couple of reasons. It had grown to be a few hundred people, only 10 or 12 of which were still doing the research on our next generation of products. And running that business was a lot of work. It took a lot of capital. It took a lot of time. And I didn't think we were very cost-effectively getting their product to the market because we had one product or two products and we had to support a whole infrastructure to put them out.

We sold the business, and I decided I could either work on any one of the new products I had, and it would probably take another 6 or 8 or 10 years to convince the world we had a better solution to get it built and delivered, but you only get a few cycles of that in a lifetime and in a career.

My other alternative was, why don't I focus on solving these problems, creating these prototypes which we could develop relatively quickly, take them to these giant companies who do what they do well. They have marketing, they have sales, they have distribution, they have infrastructure, and I deliver the solutions to them. Because I thought we were better at doing that than these big companies and we would create by doing that business model a win-win situation. . . . And mostly the public would win, because I could get way more products out to way more people more quickly; and it would cost the public less because they are taking advantage of this larger infrastructure of my big corporate client. . . .

My concern is when I walk into that big company they've got marketing, they've got distribution, they've got everything. If I show them what I have got, the only thing that I have on my side of the table is that patent; and the only way to convince them that they should commit the huge resources to turn that into a product is to be able to say . . . you exclusively will

have the right for some period of time to do this. You give me my royalty; you get your product. The product gets to the public, and it works.

And I think that was the purpose of the patent system. . . . I think the patent system was intended to help encourage everybody to be able to participate in being innovative without needing to be a giant company. I think it works. I have got 200 people and 200 families that are supported by that system. I have got a lot of big clients that like what we deliver to them, and I think the public has gotten a lot of benefit from what we do.¹⁰⁰

Following this testimony, the House Judiciary Committee members and fellow witnesses were quick to assure Dean Kamen that he is not a troll. In reality, however, Kamen would fall within a definition of troll or NPE used by many commentators and observers, as would his firm of 200 developers. Kamen's story attests to the danger of labels that aim to undermine patent rights and discourage efficient specialization. No one could credibly claim that Mr. Kamen's resources would have been better spent, or the American public better served, had he remained a small manufacturer of a single product line. The strength of the U.S. patent system, and its protection of all patent owners both large and small, allowed Kamen to make the leap to full-time inventor.

F. Enforceable patents and the threat of litigation create incentives to license and commercialize innovative technologies that would not otherwise exist.

There is no shortage of good ideas or even novel inventions. There is, however, a scarce pool of funds to bridge the gulf between invention and viable, commercially successful product. The critical object of a well-functioning patent system is to incentivize costly and high-risk investments in innovative technologies that would not otherwise exist. As Kamen's story attests, the fabled "inventor in the garage" exists, but he or she requires a diverse array of collaborators and financial backers to complete the complex and lengthy process of technological development and commercialization.

By the same token, commercially successful products inherently involve incremental and complementary improvements, large and small, that may implicate numerous inventors and patented technologies. Good ideas would likely abound regardless of whether patents existed. But patent rights are essential to the lengthy, expensive, and collaborative process necessary to develop, test, and commercialize a viable product.

Strong, enforceable patents – backed by a credible threat of legal remedies – facilitate this collaborative process in at least two important ways. First, the patent's right to exclude plays a pro-competitive coordinating role in bringing to the table the many complementary users necessary to bring a product to market – technologists, developers, manufacturers, marketers, distributors, and of course capitalists. Second, the fact that the right to exclude can be enforced in court encourages implementers to bargain and strike a deal.¹⁰¹ Conversely, the right to exclude incentivizes the patent owner to share

¹⁰⁰ Patent Trolls: Fact or Fiction? Hearing Before the Senate Subcomm. on Courts, the Internet, and Intellectual Property, 109th Cong. 30-33 (2006) (statement of Dean Kamen, President, DEKA Research & Development Corporation).

¹⁰¹ See F. Scott Kieff, A Keirestu Approach to Patents, *Intellectual Asset Management Magazine*, Feb./Mar. 2007.

its invention with outside collaborators, rather than maintain it as a secret. For downstream manufacturers and financial backers, an enforceable right to exclude creates a realistic expectation that investments in the patented technology will yield a protectable and profitable market.¹⁰²

Patents would cease to drive coordination and collaboration if the threat of litigation and meaningful remedies were illusory and beyond the reach of certain classes of patent owners. The sewing machine “patent war” is a case in point. Although the sewing machine hardly seems a high tech wonder in today’s digital world, it was, in 1830, a revolutionary product that took nearly a century to commercialize, with several stages of incremental improvements. The first successful sewing machine comprised ten complementary elements, which were invented and patented by different inventors – including small innovators who would unquestionably qualify as NPEs – over the course of many decades.¹⁰³

Patent rights incentivized continued investment in the improvements necessary to achieve a functional sewing machine and ultimately encouraged fierce rivals, both large and small, to license complementary technologies as a means of building an efficient and productive market. As noted above, patent litigation and the threat of continued litigation played a critical role in driving these different players to choose détente in the form of cooperative cross-licensing, in lieu of market dominance by one or two large manufacturers.

- G. A weak patent system that discourages enforcement by NPEs would chill disruptive innovation and, in turn, promote market dominance by large incumbents.

Whereas strong, enforceable patent rights promote specialization and collaboration throughout a diverse ecosystem, weak patents favor a tightly controlled market of large manufacturers. Professor Scott Kieff describes this phenomenon as the Keiretsu effect, in reference to the Japanese conglomerates that benefit from the country’s relatively weak system of patent rights.¹⁰⁴ Kieff argues that weak patent rights allow large incumbent competitors to use patent litigation as a means of communicating, coordinating, and preventing the commercialization of new technologies. Strong

¹⁰² See Joseph Hadzima et al., IP in Early Stage Commercial and Investment Success Intellectual Asset Management Magazine, Mar./Apr. 2010 (finding that “across all sectors a significantly higher percentage of venture capital backed winners (companies that have been acquired or have gone public) have patent portfolios as opposed to losers (companies that are out of business)”); Ted Sichelman & Stuart J.H. Graham, Patenting by Entrepreneurs: An Empirical Study, 17 Mich. Telecomm. Tech. L. Rev. 111, 157 (2010), available at <http://www.mttl.org/volseventeen/Sichelman&Graham.pdf> (finding that securing financing and improving valuation plays an important role in start-ups’ decisions to file for patents); David H. Hsu & Rosemarie Ziedonis, Patents as Quality Signals for Entrepreneurial Ventures 4 (2007) (finding that a doubling of patent application stock is associated with a 24% increase in investor estimates of young semiconductor companies).

¹⁰³ See Adam Mossoff, The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s, 53 Ariz. L. Rev. 165 (2011).

¹⁰⁴ F. Scott Kieff, A Keiretsu Approach to Patents, Intellectual Asset Management Magazine, Feb./Mar. 2007, at 53.

patents, on the other hand, increase competition and are used by small, innovative firms as “the slingshots able to take down the Goliaths.”¹⁰⁵

For example, unlike many other countries, the United States allows for strong patents in basic biotechnology. As a result, many small and medium-sized innovative firms – that do not necessarily commercialize their patents – have “spurred the US biotechnology industry to be the most vibrant and competitive in the world.”¹⁰⁶

- H. A liquid, secondary market in patents is integral to a well-functioning innovation economy.

Even in the best of economic times, approximately 50 percent of startups will fail within the first five years of their existence.¹⁰⁷ Those that do survive are a critically important source of new job growth. Nevertheless, the ones that fail may have invested significant resources in patented inventions that remain technologically and commercially valuable despite the startup’s demise.

At the other end of the spectrum are former technological pioneers like Kodak, which may be facing bankruptcy but whose patents are highly relevant to today’s generation of high tech products.¹⁰⁸ In between are a wide range of companies that buy and sell patents for a variety of strategic reasons, including to bolster their position in litigation with competitors.¹⁰⁹ Notable examples include Google’s acquisition of Motorola Mobility’s 17,000 patents for \$12.5 billion, and Microsoft-Apple-RIM’s acquisition of 6,000 Nortel patents for \$4.5 billion.¹¹⁰ A liquid, secondary market in patents ensures that startups and mature companies alike are able to recoup a sizeable investment in their patents for inventors, employees, investors, shareholders, and creditors. Moreover, it creates a new life for an invention that may prove commercially viable in different hands.

A patent’s value is intrinsically linked to its enforceability by both the inventor and subsequent purchasers. If a purchaser’s rights are significantly weakened solely because of its business model, the value of, and market for, patents will greatly diminish. Nevertheless, much of the commentary around so-called PAEs would severely limit the enforceability of patents acquired in the secondary market, but only if the purchaser is a non-practicing entity. Proposals by the FTC and other IP skeptics suggest that a secondary market in patents is somehow anti-competitive when the patent is acquired by a PAE or NPE to generate revenue from product manufacturers. According to the FTC Report, for example, these so-

¹⁰⁵ Id.

¹⁰⁶ Id. See also Battelle Technology Partnership Practice, *The U.S. Pharmaceuticals Sector: Economic Contribution to the Nation* (2011), http://www.phrma.org/sites/default/files/159/2011_battelle_report_on_economic_impact.pdf; Ted Buckley, *Biotechnology Indus. Org.*, *The Myth of the Anticommons* (2007), <http://test.bio.org/ip/domestic/TheMythoftheAnticommons.pdf>.

¹⁰⁷ See e.g., <http://smallbiztrends.com/2011/09/why-do-most-start-ups-fail.html>.

¹⁰⁸ See, e.g., <http://www.reuters.com/article/2012/03/15/kodak-patents-idUSL2E8EF2XW20120315>

¹⁰⁹ See, e.g., Gina Smith, *Why Tech Vendors Fund Patent Trolls*, *Computerworld* (Apr. 5, 2012).

¹¹⁰ See, e.g., http://seattletimes.nwsourc.com/html/business/technology/2017500355_googlemotorola14.html.

called *ex post* licensing activities “can deter innovation by raising costs and risks without making a technological contribution.”¹¹¹

The FTC Report ignores the fact that the patent itself embodies a proprietary technological contribution. Moreover, the Report assumes that highly sophisticated, *Fortune 100* manufacturers are routinely blindsided by patents asserted by PAEs; and even more significantly, that they are unable to identify relevant patents before commercializing products. This would signify a fundamental breakdown in the notice provided by patent publication. The Report fails to cite any compelling empirical data to support these assumptions and apparently ignores the possibility that some manufacturers elect to implement patented technologies without clearing potential patents or with knowing disregard for third party patent rights.

Mandatory public disclosure of a claimed invention has historically served as the *quid pro quo* for enforceable patent rights. When a patent applicant discloses to the world its claimed invention, potential implementers are placed on notice that unauthorized use of the inventions carries a risk of infringement. The patent owner, in turn, recognizes that disclosure carries the risk that not all implementers will, in fact, seek a license before making use of the invention. The patent, however, creates the opportunity to seek adequate redress once infringement is discovered, even after a product reaches the market – which may well be the patent owner’s first opportunity to discover the potential infringement.

The FTC Report and similar policy proposals would turn our patent system on its head and place the onus on the patent owner to identify, and secure licenses from, all potential users of its technology before an implementing product reaches the market – but only if the patent owner is an NPE or PAE. Significantly, product manufacturers would enjoy the same robust patent rights that facilitated their market leadership. Such measures would fundamentally transform our democratic, inclusive patent system into a decidedly undemocratic class system that seeks to shield already dominant manufacturers from the disruptive effects of NPEs and PAEs, no matter how meritorious their patents. It is deeply troubling that the FTC would justify discriminatory and unprecedented proposals of this type in the name of competition and innovation.

IV. A Rational Approach to Public Policy: Shifting Focus to Undesirable Conduct by Litigants

- A. Over the past decade Congress and the courts rebalanced the litigation landscape through substantive and procedural reforms that make it easier to defend patent litigation and challenge questionable patents.

At their core, concerns about NPEs tend to flow from either a self-serving desire by technology aggregators to minimize their liability exposure no matter the merits of a patent or its owner, or perceived fears that the patent system facilitates unfair litigation or licensing tactics — including business models built exclusively around acquiring and enforcing overly broad patents “*ex post*” against successful products to extract “nuisance” settlements. The first motivation is understandable but not a

¹¹¹ See Federal Trade Commission, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* 8 (2011).

legitimate basis for public policy recommendations. The latter concerns exist in some form in every commercial litigation context.

In the patent context, concerns about excessive litigation costs and questionable patents (which, as noted above, lack empirical support) have dominated legislative debate for as long as our patent laws have existed. These issues drove the patent reform movement of the past decade and yielded an unprecedented number of government-led reports, hearings, studies, workshops, roundtables, as well as several of the most significant Supreme Court and Federal Circuit decisions in decades. And, of course, the AIA was the direct end-product of this intensive reform movement.

Recent judicial decisions have rebalanced the patent system in a manner that unquestionably improves the litigation landscape for large patent implementers, most notably the vertically integrated IT manufacturers that have perpetuated much of the troll and NPE mythology. For patent owners, these reforms have made it more difficult to obtain patent rights (particularly for business method inventions) and secure meaningful remedies against a proven infringer, particularly injunctive relief and enhanced damages. In addition, these decisions have made it easier for alleged infringers to avoid venue in undesirable districts (most notably, the Eastern District of Texas) and challenge evidence of compensatory damages.¹¹²

By the time the AIA passed in 2011, the Supreme Court and Federal Circuit had obviated the need for most litigation-focused legislative reforms. However, the AIA includes a number of additional measures that aim to improve patent quality at the front end, facilitate administrative “post grant” review of issued patents, and further reduce the cost of patent litigation for alleged infringers. These latter changes include amendments that make it more difficult for patent owners to join multiple defendants at trial (and thus more costly to enforce patent rights), and provide limited immunity for companies that made prior commercial use of an invention before it was patented (i.e., the “prior user defense”).

Perhaps most importantly, the AIA creates three new tracks within the USPTO to challenge the validity of questionable patents throughout their life, in each case subject to a much lower burden of proof than applies to judicial validity challenges. If an NPE or other patent owner asserts a patent of questionable validity, these proceedings provide alleged infringers with a cheaper and more expedient path (i.e., relative to court-based validity proceedings) to seek outright invalidation or modification of the patent.¹¹³

Historically, the majority of patents challenged through an administrative post-grant proceeding survive with fewer claims and/or a narrower claim scope, which can dramatically reduce a challenger’s exposure to infringement liability and damages. As a result, the expanded post-grant system provides a powerful tool to limit and potentially avoid the costs of infringement litigation.

¹¹² See Innovation Alliance, U.S. Supreme Court and Federal Circuit Patent Cases (2006-Present): Judicial Patent Reform at Work (2011).
<http://www.innovationalliance.net/files/Judicial%20Patent%20Reform%20-%20AIA%20Report%203-09%20SUMMARY.pdf>

¹¹³ Leahy-Smith America Invents Act, Pub. L. 112–29, § 6, 125 Stat. 284, 299 (2011).

- B. The federal courts already have the authority to address undesirable litigation conduct and are equally focused on procedural flaws that increase costs.

In short, the last decade has witnessed one of the most active and sweeping periods of patent reform in our history. Rather than continuing down the rabbit hole of what is, or is not, an NPE or PAE, the patent community would be far better served by focusing on undesirable conduct or procedural flaws in our system of litigation that exacerbate costs or the risk of abuse. This was the clear consensus of the 2006 House Hearings.

In IA's view, remaining concerns about potential litigation costs and abuses are best addressed through existing rules, procedures, and remedies, without the need for additional substantive reforms. In his recent speech, Chief Judge Rader highlighted excessive discovery as the leading cause of litigation costs and inefficiencies — a view that is shared by many civil litigation experts across all areas of commercial litigation. Chief Judge Rader observed, however, that discovery costs in patent litigation are considerably higher, on average, than in other types of complex litigation and thus create a tactical weapon for litigants. In response, the Advisory Council of the Federal Circuit is in the process of drafting a model rule on e-discovery governance to help modernize discovery processes and reduce costs.¹¹⁴

Judge Rader noted several other procedural steps that could facilitate early and fair resolution of patent cases and thus reduce costs — e.g., a well-crafted summary judgment motion, appropriate choice of venue, and early valuation of the case. Such measures require a degree of professionalism, self-discipline, and cooperation among litigants that may seem increasingly rare in modern day litigation. However, each of these improvements is readily achievable without legislation or *sui generis* rules for NPEs or PAEs.

When litigants engage in “troll” or “grasshopper”-type behavior as determined by the court, Chief Judge Rader advocated fee shifting (i.e., requiring a losing party to pay the winning party's attorney's fees and costs) as an appropriate response by district court judges — again, however, using existing statutory authority. Section 285 of the Patent Act permits fee shifting in “exceptional” cases. Chief Judge Rader posited that when a case is brought solely to “obtain revenue from litigation avoidance instincts” (i.e., for “nuisance” value), it arguably qualifies as exceptional. In such cases, Rader predicted that the Federal Circuit would typically uphold the district court's decision to award attorney's fees absent clear error or an abuse of discretion. And, in fact, the Federal Circuit did just that in January 2012, when it affirmed a lower court's award of \$4 million in attorney's fees and costs against a plaintiff whose attorneys had engaged in litigation misconduct.¹¹⁵

Thus, the federal courts can and do address misconduct by patent litigants, where appropriate. Exercising this authority on a case-by-case basis, and in a non-discriminatory manner, is the best and fairest means of discouraging bad behavior without inadvertently penalizing the many “good” NPEs that comprise much of our innovation economy.

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¹¹⁴ Randall R. Rader, Chief Judge, U.S. Court of Appeals for the Fed. Circuit, Address at the Eastern District of Tex. Judicial Conference: The State of Patent Litigation (Sept. 27, 2011).

¹¹⁵ See *MarcTec LLC v. Johnson & Johnson*, No. 2010-1285 (Fed. Cir. Jan. 3, 2012).

Finally, we would highlight the one piece of unfinished legislative business that Congress regrettably did not address in the AIA. In particular, Congress failed to codify a permanent end to the practice of diverting fees from the USPTO to fund other government activities unrelated to the patent system. Although the USPTO is funded entirely by user fees, the Office is dependent on federal appropriators to access its full pool of user fees. Over the last two decades, appropriators have redirected more than \$875 million in user fees to other governmental purposes, thus depriving the USPTO of essential resources. Fee diversion has led to personnel shortages, an ever-growing backlog of patent applications, and skepticism as to the quality of patent examination processes and issued patents. This skepticism undermines public confidence in the patents asserted by NPEs and PAEs and fuels the misperception that patent litigation is inherently unfair to alleged infringers, and that remedies are excessive relative to the value of the patent.

The Senate predecessor to the AIA would have permanently ended fee diversion, a true pro-quality reform that all stakeholders supported. This reform would have been an effective measure to improve patent quality overall without unnecessarily attacking any particular business model. Unfortunately, this provision was stripped from the final House bill due to opposition from congressional appropriators. As a result, USPTO must work to ensure full access to user fees on an annual basis, without the certainty needed to plan appropriately for the future or ensure the proper day-to-day functioning of an agency that oversees America's most valuable innovative assets.

Just as consumer confidence is essential to economic growth, confidence in the USPTO is critical to the health of our patent system. We would encourage GAO to include in its report a recommendation that Congress permanently end fee diversion.

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Thank you considering the views of the Innovation Alliance on these important issues. We would welcome the opportunity to discuss our comments with you and your staff.

Appendix A

Studies, Reports, and Articles cited by the Innovation Alliance

- AMERICAN INTELLECTUAL PROPERTY LAW ASSOCIATION, REPORT OF THE ECONOMIC SURVEY 2011 (2011).
- GWENDOLYN G. BALL & JAY P. KESAN, *TRANSACTION COSTS AND TROLLS: STRATEGIC BEHAVIOR BY INDIVIDUAL INVENTORS, SMALL FIRMS AND ENTREPRENEURS IN PATENT LITIGATION* 15, 18 (U. ILL. L. & ECON., WORKING RESEARCH PAPER SERIES NO. LE09-005, 2009).
- CHRIS BARRY ET AL., PRICEWATERHOUSECOOPERS, 2009 PATENT LITIGATION STUDY: A CLOSER LOOK, PATENT LITIGATION TRENDS AND THE INCREASING IMPACT OF NONPRACTICING ENTITIES (2009).
- CHRIS BARRY ET AL., PRICEWATERHOUSECOOPERS, 2010 PATENT LITIGATION STUDY 6 (2010).
- CHRIS BARRY ET AL., PRICEWATERHOUSECOOPERS, 2011 PATENT LITIGATION STUDY (2011).
- BATTELLE TECHNOLOGY PARTNERSHIP PRACTICE, THE U.S. PHARMACEUTICALS SECTOR: ECONOMIC CONTRIBUTION TO THE NATION (2011).
- ERIC D. BEINHOCKER, THE ORIGIN OF WEALTH (2006).
- ANTHONY BREITZMAN & DIANA HICKS, SMALL BUS. ADMIN., OFFICE OF ADVOCACY, AN ANALYSIS OF SMALL BUSINESS PATENTS BY INDUSTRY AND FIRM SIZE (2008).
- ANTHONY BREITZMAN & PATRICK THOMAS, SMALL BUS. ADMIN., OFFICE OF ADVOCACY, ANALYSIS OF SMALL BUSINESS INNOVATION IN GREEN TECHNOLOGIES (2011).
- TED BUCKLEY, BIOTECHNOLOGY INDUS. ORG., THE MYTH OF THE ANTICOMMONS (2007).
- 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 (2009).
- COLLEEN V. CHIEN & MARK A. LEMLEY, PATENT HOLDUP, THE ITC, AND THE PUBLIC INTEREST (2012), [HTTP://SSRN.COM/ABSTRACT=2022168](http://ssrn.com/abstract=2022168).
- DAMIEN GERARDIN ET AL., ELVES OR TROLLS? THE ROLE OF NON-PRACTICING PATENT OWNERS IN THE INNOVATION ECONOMY (TILBURG LAW AND ECONOMICS CENTER (TILEC) DISCUSSION PAPER NO. 2008-018, MAY 2008).
- JOHN M. GOLDEN, "PATENT TROLLS" AND PATENT REMEDIES, 85 TEX. L. REV. 2111, (2007).
- STUART J.H. GRAHAM, ROBERT P. MERGES, PAM SAMUELSON & TED SICHELMAN, HIGH TECHNOLOGY ENTREPRENEURS AND THE PATENT SYSTEM: RESULTS OF THE 2008 BERKELEY PATENT SURVEY, 24 BERKELEY TECH. L.J. 1255 (2010)
- BRIAN HEADD, SMALL BUS. ADMIN., OFFICE OF ADVOCACY, AN ANALYSIS OF SMALL BUSINESS AND JOBS (MARCH 2010).
- JOSEPH HADZIMA ET AL., *IP IN EARLY STAGE COMMERCIAL AND INVESTMENT SUCCESS* INTELLECTUAL ASSET MANAGEMENT MAGAZINE, MAR./APR. 2010.
- JOHN C. HALTIWANGER, RON S. JARMIN, & JAVIER MIRANDA, NATIONAL BUREAU OF ECONOMIC RESEARCH, WHO CREATES JOBS? SMALL VS. LARGE VS. YOUNG (WORKING PAPER 16300, AUG. 2010)
- MICHAEL HORRELL AND ROBERT LITAN, KAUFFMANN FOUNDATION, AFTER INCEPTION: HOW ENDURING IS JOB CREATION BY STARTUPS (JULY 2010)

DAVID H. HSU & ROSEMARIE ZIEDONIS, PATENTS AS QUALITY SIGNALS FOR ENTREPRENEURIAL VENTURES (2007).

INNOVATION ALLIANCE, U.S. SUPREME COURT AND FEDERAL CIRCUIT PATENT CASES (2006-PRESENT): JUDICIAL PATENT REFORM AT WORK (2009).

INTELLECTUAL PROPERTY AND THE U.S. ECONOMY: INDUSTRIES IN FOCUS, U.S. DEPARTMENT OF COMMERCE (MARCH 2012).

STEVEN JOHNSON, WHERE GOOD IDEAS COME FROM: THE NATURAL HISTORY OF INNOVATION (2010).

B. ZORINA KHAN & KENNETH L. SOKOLOFF, INSTITUTIONS AND TECHNOLOGICAL INNOVATION DURING EARLY ECONOMIC GROWTH: EVIDENCE FROM THE GREAT INVENTORS OF THE UNITED STATES, 1790-1930, NATIONAL BUREAU OF ECONOMIC RESEARCH (WORKING PAPER 10966, 2004).

B. ZORINA KHAN, PROPERTY RIGHTS AND PATENT LITIGATION IN EARLY NINETEENTH-CENTURY AMERICA, 55 J. ECON. HIST. 58 (1995).

B. ZORINA KHAN, TECHNOLOGICAL INNOVATION AND ENDOGENOUS CHANGES IN U.S. LEGAL INSTITUTIONS, 1790-1920, NATIONAL BUREAU OF ECONOMIC RESEARCH (WORKING PAPER 10346, 2004).

TIM KANE, KAUFFMAN FOUNDATION, THE IMPORTANCE OF STARTUPS IN JOB CREATION AND JOB DESTRUCTION (2010).

F. SCOTT KIEFF, *A KEIRESTU APPROACH TO PATENTS*, INTELLECTUAL ASSET MANAGEMENT MAGAZINE, FEB./MAR. 2007.

MARK A. LEMLEY, *ARE UNIVERSITIES PATENT TROLLS?*, 18 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 611 (2008).

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 (2007).

ADAM MOSSOFF, *THE RISE AND FALL OF THE FIRST AMERICAN PATENT THICKET: THE SEWING MACHINE WAR OF THE 1850s*, 53 ARIZ. L. REV. 165 (2011).

RICHARD OGLE, SMART WORLD: BREAKTHROUGH CREATIVITY AND THE NEW SCIENCE OF IDEAS (2007).

NAM D. PHAM, NDP CONSULTING, THE IMPACT OF INNOVATION AND THE ROLE OF INTELLECTUAL PROPERTY RIGHTS ON U.S. PRODUCTIVITY, COMPETITIVENESS, JOBS, WAGES, AND EXPORTS (2010).

ARTI RAI, STUART GRAHAM, MARK DOMS, PATENT REFORM: UNLEASHING INNOVATION, PROMOTING ECONOMIC GROWTH, & PRODUCING HIGH-PAYING JOBS, U.S. DEPARTMENT OF COMMERCE WHITE PAPER (APRIL 13, 2010).

MICHAEL RISCH, *PATENT TROLL MYTHS*, 42 SETON HALL L. REV. (FORTHCOMING 2012).

EDWARD B. ROBERTS & CHARLES EESLEY, MIT SLOAN SCHOOL OF MANAGEMENT/KAUFFMAN FOUNDATION, ENTREPRENEURIAL IMPACT: THE ROLE OF MIT (2009).

CARL SHAPIRO, *INJUNCTIONS, HOLD-UP, AND PATENT ROYALTIES* (HAAS SCHOOL OF BUSINESS WORKING PAPER, 2006).

ROBERT J. SHAPIRO & KEVIN A. HASSETT, THE ECONOMIC VALUE OF INTELLECTUAL PROPERTY (2005).

SANNU K. SHRESTHA, *TROLLS OR MARKET-MAKERS? AN EMPIRICAL ANALYSIS OF NONPRACTICING ENTITIES*, 110 COLUM. L. REV. 114 (2010).

TED SICHELMAN & STUART J.H. GRAHAM, *PATENTING BY ENTREPRENEURS: AN EMPIRICAL STUDY*, 17 MICH. TELECOMM. TECH. L. REV. 111 (2010).

PETER V. STERN & TIMOTHY G. DOYLE, *TRENDS AND DEVELOPMENTS REGARDING NONPRACTICING ENTITIES IN THE U.S.*, 61 CHIZAI KANRI 445 (2011).

Appendix B

