

DO NPEs MATTER? NON-PRACTICING ENTITIES AND PATENT LITIGATION OUTCOMES

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ABSTRACT

It is widely argued that so-called “patent trolls” are corrupting the U.S. patent system and endangering technology innovation and commercialization at large. For example, a recent White House report argued that “trolls” hurt firms of all sizes and advocated for specific policies aimed at curtailing practices thought to be particularly harmful. Yet the existence and extent of any systematic effects of so-called “troll-like” behavior, and the implications of modern patent assertion practices by Non-Practicing Entities (“NPEs”), remains unclear. This article develops novel empirical evidence to inform the debate over NPEs on patent litigation. Specifically, we conduct a large-scale empirical analysis of more than 1,750 patent infringement cases decided by a judge or jury in U.S. district courts between 1995 and 2011. We focus on case outcomes, including findings of validity and infringement, and the distributions and values of resulting damage awards. We find some relatively small differences in terms of lower success rates and award values in cases where the patent holders are NPEs. Yet across the subset of cases in which damages are awarded to the patent holders, we find no significant differences in the distribution of awards between NPEs and practicing entities. Nonetheless, there are substantial differences in litigation behavior,

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success rates, and award values among types of NPEs (that is, universities, individuals, and Patent Assertion Entities (“PAEs”). Moreover, we find evidence of certain NPEs engaging in strategic and rational patent acquisition, assertion, and settlement-licensing practices. We posit that these practices may reflect, or perhaps derive from, the economic separation of patent rights from their underlying technologies that is represented in NPE approaches to patent assertion.

JEL: C01; K39; O30; O31; O34; Z18

I. INTRODUCTION

It is widely argued that so-called “patent trolls” are corrupting the U.S. patent system and endangering technology innovation and commercialization at large. As an example, one influential study estimated the “direct costs” of patent troll litigation in the United States in 2011 at \$29 billion.¹ Yet actual infringement awards received by NPEs remain poorly understood. This study develops novel empirical evidence to inform the debate over the effects of NPEs on patent litigation and to lay the groundwork for future analysis. Specifically, we analyze patent infringement awards obtained by NPEs and their characteristics and systematic value drivers. We conduct a large-scale empirical analysis of over 1,750 patent infringement cases decided by a judge or jury in U.S. district courts from 1995 to 2011. Using this analysis, we examine the real economic implications of different types of NPEs and modern patent monetization practices.

There has been significant concern and media attention over “patent trolls” in recent years. The popular NPR piece “When Patents Attack” exemplifies common sentiment against the perceived harms inflicted by entities that abuse the patent system.² Concerns about “troll-like” behavior have also dominated academic debate and patent policy discussions, and recently the White House has also advocated for specific measures to address patent trolls. The White House issued a report in June 2013 describing several harmful effects of “troll” practices, such as an increase in patent suits generally, costs faced by practicing companies of all sizes from defending and settling infringement claims from PAEs, and deterrent effects on technology innovation.³ The White House Report advocated for specific policies to “reduce the extent to which legal rules allow patent owners to capture a disproportionate share of returns to investment.”⁴

¹ James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes*, 99 CORNELL L. REV. (forthcoming 2014), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2091210.

² *When Patents Attack* (Chicago Public Media radio broadcast July 22, 2011), available at www.thisamericanlife.org.

³ Executive Office of the President, *Patent Assertion and U.S. Innovation* (June 2013) [hereinafter White House Report], available at www.whitehouse.gov/sites/default/files/docs/patent_report.pdf.

⁴ *Id.* at 13.

The FTC's most recent report addressing patent remedies—*The Evolving IP Marketplace, Aligning Patent Notice and Remedies with Competition*—devoted several sections to exploring leading scholarship and potential economic implications of Patent Assertion Entities (PAEs) and other NPEs.⁵ It examined leading theories and positions on both ends of the spectrum, exploring possible positive and negative effects of modern patent monetization and assertion practices. Yet the FTC Report did not evaluate the systematic effects of PAEs or other NPEs more generally, and it specifically called for new empirical analysis to examine these issues. More recently, FTC Chairwoman Ramirez recently called for a formal “Section 6(b)” study of PAEs and their practices.⁶

This article studies NPE practices from the basis of patent infringement remedies and systematic value factors. We conduct a large-scale empirical analysis of over 1,750 U.S. district court patent infringement case decisions from 1995 through 2011 to determine whether fundamental distinctions between NPE and non-NPE awards can be identified. In particular, we focus on two principal questions. First, we examine the raw data to see how the NPEs are represented within the universe of decisions over time and how successful they have been in winning cases. Next, we conduct targeted regressions of damage values to determine whether NPE status has a statistically significant effect on award outcomes. This analysis sheds light on the economic effects of NPE enforcement relative to other patent litigants. More generally, this contributes to an understanding of modern patent assertion practices and the evolving new economy of patent monetization.

Our key findings include the following: (1) The share of cases where patent holders are not practicing the invention has remained relatively stable over time. Given the significant increase in case filings that other studies have attributed to PAEs, our result may indicate a greater willingness of PAEs to settle litigation before adjudicated outcomes. (2) We also find a noticeable shift from individuals to patent assertion entities as plaintiffs over the last several years. This might provide evidence of the upstream remuneration of inventive activity that PAEs are thought to provide. (3) Interestingly, cases involving awards to NPEs appear to be evenly distributed by award value across the dataset. Closer analysis reveals that the distribution of NPE awards is not statistically different than that of other awards. This may suggest that NPEs face similar litigation risks as practicing entities and generally do not have superior information that could advantage them in case selection. (4) Importantly, NPEs are somewhat less successful in the case outcomes, both in terms of findings of validity and infringement and in terms of damage award levels in successful cases. (5)

⁵ FED. TRADE COMM'N, *THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION* (Mar. 2011) [hereinafter FTC Report].

⁶ See Edward Wyatt, *FTC is Said to Plan Inquiry of Frivolous Patent Lawsuits*, N.Y. TIMES, June 20, 2013, at B1.

There are differences in outcomes when we classify non-practicing patent holders into finer categories. Specifically, non-practicing firms (or PAEs) have better results in terms of success rates and award values than individuals and universities. The trend in overall cases indicates that individuals are involved in fewer cases in more recent years, with PAEs making up the difference. This could reflect patent acquisitions and institutional expertise among PAEs relative to other NPE types.

Part II addresses relevant conceptual background and scholarship. Part III outlines the research methodology employed in this article and presents descriptive statistics about the dataset and results of our empirical analysis. Part IV discusses policy implications. Part V concludes with questions for future study.

II. BACKGROUND

This part addresses relevant theoretical background and scholarship informing our study. First, we highlight some of the definitional ambiguity underlying the terms “non-practicing entity,” “patent assertion entity,” and, indeed, “patent troll.” In so doing, we call out the structural similarities between these entities and their practices and focus on identifying systematic differences (if any) between different types of NPEs and relative to practicing patent holders. Next, we provide an overview of some prior studies that have addressed litigation rates involving NPEs and other relevant data.

A. Theoretical Background

The FTC Report notably adopted the definition of “patent assertion entity” in its assessment of modern patent enforcement and licensing practices. It identified several potential and theoretical concerns with PAE practices, including a general increase in patent litigation suits,⁷ the risk of holdup and excessive damages faced by practicing technology companies,⁸ problems with patent notice and difficulty in identifying and clearing relevant patent rights,⁹ and concerns over patent quality,¹⁰ particularly with respect to patents held by PAEs.

However, the FTC Report also observed that a new marketplace of patent transactions is developing, and certain practices considered to be detrimental may in fact have net benefits in this new context. For example, PAEs can provide remuneration to individual inventors from whom they acquire

⁷ FTC Report, *supra* note 5, at 58–59. See also PricewaterhouseCoopers, *2012 Patent Litigation Study 7* [hereinafter 2012 PwC Study].

⁸ FTC Report, *supra* note 5, at 78–79.

⁹ *Id.* at 77–78.

¹⁰ *Id.* at 7.

patents.¹¹ In addition, in downstream patent markets, PAEs can provide liquidity for patent transactions and valuation comparisons for fair market benchmarking.¹²

Accordingly, as used in the FTC Report, “patent assertion entity” is a broad and morally agnostic term used to describe a range of patent enforcement and transactional practices. The term PAE is itself a subset of the broader term “non-practicing entity.” Unlike PAEs, NPEs include universities and other patent owners that primarily seek to develop and transfer technology.¹³ At a more fundamental level, the difficulty in labeling bad “patent troll” behavior reflects a structural ambivalence that is inherent to patents. For example, is it more legitimate for a university to enforce its patent portfolio than for a patent litigation fund to do so? Is it preferable for an individual inventor to exploit her rights directly rather than first assigning her rights to a PAE? Even muddier still is the question of “defensive” patent portfolios owned by practicing entities. If a company shields its product lines from competition by enforcing patents that do not cover those products, is this more socially beneficial than if a PAE sues each entity indiscriminately in a downstream technology market? Going further, how should we view large companies that build massive patent portfolios, which they cross-license to other industry titans¹⁴ or hold as arsenals to avoid being sued for infringing activity? Are these more legitimate uses of patent rights than fund models focused on monetization?

These questions are not the consequence of modern business practices or innovation in the ways patent rights are exploited. They arise from the patent grant itself. There is no requirement for a patent holder to practice its rights in order to maintain or be entitled to enforce them. Patent rights, like other property rights, are fully transferable and alienable. Exclusive and non-exclusive licenses can be subdivided to infinitesimal degrees of scope, duration, and control rights. These features are fundamental to patents and are true for patents held by universities, inventors, practicing companies, PAEs, and true “trolls” alike.

Patent infringement awards provide a useful basis to assess the characteristics and effects of NPE litigation, given certain key differences between remedies available to NPEs and other patent litigants. Current U.S. patent law reduces the chances for NPEs to be awarded injunctions for patent infringement. Post-*eBay*, damages are generally the sole remedy available to NPEs and

¹¹ *Id.* at 68–69. See also James F. McDonough, III, *The Myth of the Patent Troll: An Alternative View of the Function of Patent Dealers in an Idea Economy*, 56 EMORY L.J. 189, 190 (2007) (arguing that “patent trolls make the patent market more efficient by realigning market participant incentives, making patents more liquid, and clearing the patent market.”).

¹² FTC Report, *supra* note 5, at 69–70.

¹³ *Id.* at 62–67.

¹⁴ See, e.g., F. Scott Kieff, *A Keiretsu Approach to Patents*, INTELL. ASSET MGMT., Feb.–Mar. 2007, at 51.

other entities that do not practice in the relevant technology market.¹⁵ Moreover, non-practicing entities by definition are not entitled to lost profit damages, which require proof of direct competition with the accused infringer.¹⁶ Therefore, in contrast to practicing entities, reasonable royalties are likely to be the predominant form of remedy available to PAEs and other types of NPEs. In addition, it should not be overlooked that NPEs, unlike practicing entities, are largely immune from the risk of infringing patents, given that they lack tangible operations. Thus, NPEs are exclusively in the position of seeking damages for infringement, whereas practicing entities may alternatively be defending against liability.

Accordingly, patent infringement awards offer one potential area of distinction between NPEs and practicing entities from which other, perhaps fundamental characteristics and differences may be identified.

B. Relevant Prior Scholarship

In this article, we conduct the first large-scale analysis of patent infringement damages awarded to patent assertion entities. Previous studies have undertaken empirical analysis of PAE and other NPE practices from other angles, and the following paragraphs briefly review certain relevant prior scholarship.

A set of articles published between 2000 and 2004 by Jean Lanjouw and Mark Schankerman study the predictability and determinants of patent infringement suits generally.¹⁷ The authors find certain characteristics of litigants and patents that tend to lead to more or less litigation. For example, the probability of patent litigation increases if the patent is core to a set of follow-on innovations for a corporation and if a corporation has closely related rivals and needs to maintain a reputation for protecting its intellectual property.¹⁸ On the other hand, corporations that are part of concentrated industries or that have large patent portfolios are less likely to see litigation.¹⁹ Further, they identify certain patent characteristics lending to an increased likelihood of suit, most notably a higher number of claims and more forward citations per claim.²⁰ However, these studies did not specifically focus on litigation by PAEs.

An article written by John Allison, Mark Lemley, and Joshua Walker and published in 2009 studies litigation rates with respect to highly litigated patents

¹⁵ eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388 (2006).

¹⁶ Panduit Corp. v. Stahlin Bros. Fibre Works, Inc., 575 F.2d 1152, 1157 (6th Cir. 1978).

¹⁷ See, e.g., Jean O. Lanjouw & Mark Schankerman, *Characteristics of Patent Litigation: A Window on Competition*, 32 RAND J. ECON. 129 (2001) [hereinafter *Characteristics of Patent Litigation*]; Jean O. Lanjouw & Mark Schankerman, *Protecting Intellectual Property Rights: Are Small Firms Handicapped?*, 47 J.L. & ECON. 45 (2004) [hereinafter *Protecting Intellectual Property Rights*]; Jean O. Lanjouw & Mark Schankerman, *Patent Quality and Research Productivity: Measuring Innovation with Multiple Indicators*, 114 ECON. J. 441 (2004) [hereinafter *Patent Quality*].

¹⁸ *Patent Quality*, supra note 17; *Characteristics of Patent Litigation*, supra note 17, at 129–30.

¹⁹ *Protecting Intellectual Property Rights*, supra note 17, at 48.

²⁰ *Characteristics of Patent Litigation*, supra note 17, at 131.

and addresses “trolls” litigation in this context. The authors find that litigation rates and litigant characteristics vary significantly by industry, especially for the most litigated patents.²¹ Moreover, the authors find that among the most-litigated patents, there are significantly more non-practicing entities than among the once-litigated patents.

In addition, a prior article addressing litigation rates by Mark Lemley and Carl Shapiro found that NPEs filed between 30 and 40 percent of all infringement suits in computing and electronic industries during the period studied.²² However, other studies have found that NPEs do not initiate a disproportionately large number of infringement suits.²³ Overall, patent litigation rates have been continually rising, and the 2012 PwC Study found a dramatic increase of 22 percent in cases filed in 2011 versus 2010.²⁴

Despite the focus on litigation rates, very few studies have addressed awards for patent infringement. In particular, the 2012 PwC Study reports a 10-percent higher success rate for practicing companies than NPEs.²⁵ The 2012 PwC Study also reported higher median damages awards to NPEs than practicing companies.²⁶

In addition, our prior work found that litigation awards generally are highly systematically predictable and deterministic, and certain factors have a statistically significant tendency to increase or decrease award values.²⁷

Interesting and notable work by Timo Fischer and Joachim Henkel studied characteristics of patents acquired by NPEs and found significantly greater patent scope and quality relative to control groups of patents acquired by practicing firms.²⁸ Finally, Lu’s article about NPE royalty rates in negotiated trans-

²¹ John R. Allison, Mark A. Lemley & Joshua H. Walker, *Extreme Value or Trolls on Top? The Characteristics of the Most Litigated Patents*, 158 U. PENN. L. REV. 1 (2009) (studying litigation rates of patents in specific industries). See also Shawn P. Miller, *What’s the Connection Between Repeat Litigation and Patent Quality? A (Partial) Defense of the Most Litigated Patents*, 16 STAN. TECH. L. REV. 313 (2013).

²² Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991 (2007).

²³ See, e.g., Bronwyn H. Hall & Rosemary H. Ziedonis, *An Empirical Analysis of Patent Litigation in the Semiconductor Industry* (Working Paper, 2007), available at http://elsa.berkeley.edu/~bhhall/papers/HallZiedonis07_PatentLitigation_AEA.pdf; Gwendolyn H. Ball & Jay P. Kesan, *Transaction Costs and Trolls: Strategic Behavior by Individual Inventors, Small Firms and Entrepreneurs in Patent Litigation* (U. Ill. L. & Econ. Res. Paper No. LE09-005, 2009), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1337166; 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).

²⁴ 2012 PwC Study, *supra* note 7, at 6.

²⁵ *Id.* at 12.

²⁶ *Id.* at 7.

²⁷ Michael J. Mazzeo, Jonathan Hillel & Samantha Zyontz, *Explaining the “Unpredictable”: An Empirical Analysis of U.S. Patent Infringement Awards*, 35 INT’L REV. L. & ECON. 58 (2013).

²⁸ Timo Fischer & Joachim Henkel, *Patent Trolls on Markets for Technology—An Empirical Analysis of NPEs’ Patent Acquisitions*, 41 RES. POL’Y 1519 (2012).

actions is based on RoyaltySource and ktMINE data.²⁹ He found no difference between royalty rates obtained by NPEs in licensing negotiations and those paid to practicing entities. To the extent that licensing occurs “in the shadow” of litigation, this article gives added reason to question how NPEs fare in litigation and what systematic characteristics of their awards can be observed.

Moreover, given the significant increase in litigation rates that certain other studies have attributed to PAEs, it is critical to understand the outcomes of such litigation. If PAE awards are systematically different than awards obtained by practicing entities, modern PAE practices may have a distinct and possibly detrimental economic impact on technology innovation and commercialization activity. Conversely, if PAE awards are indistinguishable from other awards, the issue refocuses to understanding the effects of *more* but not necessarily *different* patent litigation and assertion practices.

Notably, regarding terminology, we use the term “non-practicing firms” to denote NPEs that are not universities or individuals, which we believe most accurately reflects the data. We think such “non-practicing firms” are largely classifiable as “patent assertion entities,” as such term is used in the FTC Report. As discussed above, whether any particular NPE company, university, individual, or other patent litigant should be termed a “troll” is largely subjective, and accordingly we refrain from using that term in the analysis.

III. DATA AND EMPIRICAL ANALYSIS

A. Dataset

In order to take a closer look at the outcomes experienced by NPE plaintiffs in patent litigation, we began with a database maintained by the accounting firm PricewaterhouseCoopers (PwC). The PwC database contains all decided patent cases reported in Westlaw from 1995 through 2011. PwC has used these data to publish annual reports on the status of patent litigation for its clients; statistics from these reports have been cited by policy makers in the most recent patent reform debate and were also an important source for the FTC Report described above. In addition, our recent article uses information from the PwC database (supplemented with additional variables) through 2008. The dataset has been fully reviewed and modified by the staff at PwC since 2008, potentially generating some minor differences between these analyses and those in our previous article.³⁰

²⁹ Jiaqing Lu, *The Myths and Facts of Patent Troll and Excessive Payment: Have Nonpracticing Entities (NPEs) Been Overcompensated?*, 47 BUS. ECON. 234 (2012).

³⁰ The majority of cases from 2008 and earlier are the same. However, we have been able to collect some of the patent and party variables through 2008 only. Therefore, the descriptive analyses use data through 2011, but the regressions use only data from 1995 through 2008. We plan to revisit these regressions with more complete data in future work.

Through 2011, the PwC dataset contains 1,751 patent cases in Westlaw where a decision was made on patent validity and infringement at summary judgment or trial. Of those 1,751 cases, in 554 the patents were held valid and infringed. Among those cases where the plaintiffs were successful on validity and infringement, 421 had available award amounts or were cases related to Abbreviated New Drug Application (ANDA) litigation. There were 45 ANDA cases with \$0 awards (since ANDA cases do not result in damages) and 376 cases with awards greater than \$0.³¹

The coding used by PwC incorporates the NPE designation, so we will use that abbreviation as we describe and utilize their data. One of the explicit goals of our article is to employ detailed information about each case to make finer distinctions among the various kinds of non-practicing entities. Toward that end, we note that in their 2011 update, PwC added new variables on whether one of the parties to the suit was an NPE. Of those 376 cases where the plaintiffs were successful and in which damages were awarded, 79 had an NPE party and 297 had no NPE. The PwC data went further and classified each of these NPEs as companies, individuals, or universities. Our initial look at the new data takes into account this initial distinction among NPEs as well. There are likely further nuances in categorizing NPEs, which we plan to explore in future studies.

Our empirical analysis proceeds in four parts. First, we document information about cases decided—distinguishing between cases involving NPEs versus practicing companies and further distinguishing among cases in which the NPE is a company, individual, or a university. We then turn to the outcomes of cases, including whether validity and infringement are found by the court and the level of damages in cases won by the patent holder, and report the relevant statistics from the dataset. Finally, we perform straightforward regressions on the damages data to control for other factors affecting award size. This allows us to get a more precise estimate of the differences between NPE and non-NPE cases in the dataset.

B. Case Information

Figure 1 presents the annual total of cases decided each year, broken down by whether one of the parties was an NPE or not (“No NPE”). Of the 1,751 patent cases in the 2011 PwC dataset, cases containing at least one NPE party

³¹ It does appear that the number of cases has increased significantly from 1995 to 2011, but that is most likely due to Westlaw reporting bias. Prior to 2002, federal district courts were not required to report all cases electronically, so case and award information were limited in those early years. Starting in 2002, most important case information was available electronically, which made it easier to obtain patent damage awards. So more likely we are seeing the majority of cases after 2002.

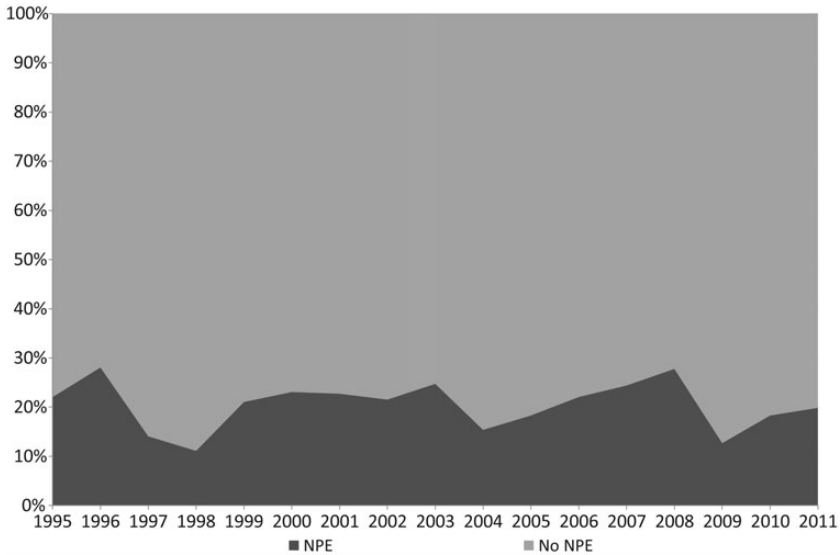


Figure 1. Patent cases involving NPEs as a percent of all cases, 1995 to 2011 (N = 1,751)

never reached over 30 percent in any given year.³² In fact, even though the number of total and NPE cases has increased over time, NPE cases have remained a relatively consistent portion of the total patent caseload—in terms of cases decided—for 17 years. To the extent that the presence of NPEs in patent litigation has become more pronounced over time (as many commentators have asserted), such trends have not yet shown up in patent case decisions. This may be due to heterogeneity in settlement behavior or lags in the court system; in Part IV, we posit possible explanations that seem consistent with PAE incentive structures, although we think further investigation of this factor is warranted.

Where the overall share of NPE cases has remained quite stable over the 1995 to 2011 period, there appear to be more substantial changes over time in the types of NPEs appearing in patent cases. In Figure 2, one can see again that NPE cases make up less than 30 percent of the cases each year. However, there has been a noticeable shift in the respective shares of cases involving NPE individuals and NPE companies. Prior to 2004 and 2005, NPE cases were dominated by individual inventors, but since then, a larger percent of NPE cases involved companies. This could be a reflection of the increased number of IP holding companies and IP aggregators that have entered the market recently. Also, to the extent the data indicate a shift from individuals to

³² Note that “year” here refers to the date of the decision in the case. Of course, individual cases may be filed several years before the decision is delivered. Our data end at this decision stage, and do not include appeals (though many of the decisions in the cases have been subsequently appealed).

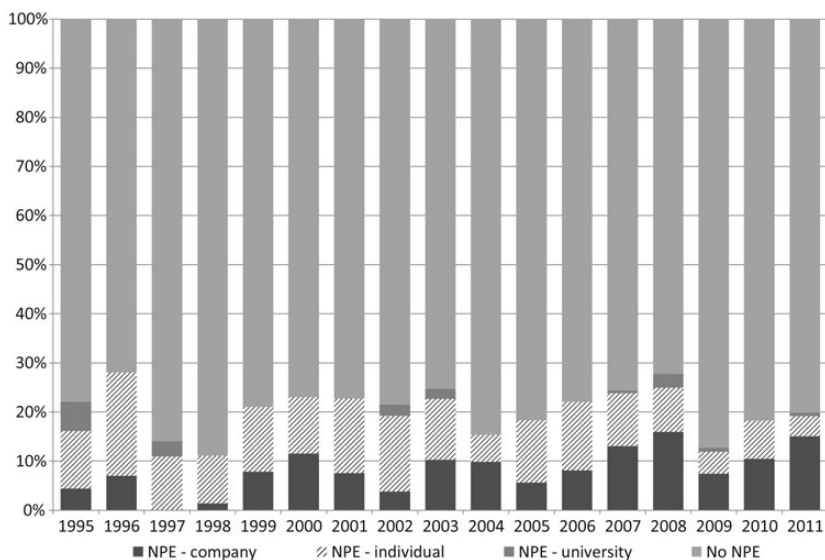


Figure 2. Patent cases involving NPEs by type as a percent of all cases, 1995 to 2011 (N = 1,751)

firms, it could reflect upstream patent transfers between them (which have been thought to be a potential benefit of PAEs by providing direct financial rewards to inventors). As we break down the identity of these parties further, we plan to focus attention on this trend and try to identify the explanation for the shift and study its overall impact on the success of patent holders and the level of damages awarded.

C. NPE Success Rates

Our next set of graphs examines the success rates of patent holders, in terms of findings of validity and infringement. In all cases across the dataset (the right-most bar in Figure 3), the patent holder success rate is 32 percent. However, there is a marked difference in patent holder success rates between cases that have an NPE party and those that do not. Of the 1,390 cases with no NPE (the farthest left bar), the success rate is 34 percent. For the 361 cases involving an NPE, we find that the success rate is more than 10 percentage points lower (the middle bar in the graph). This is consistent with PwC's findings.³³

This lower success rate is not equally true across the different NPE categories. As seen in Figure 4, cases involving universities have a higher patent holder success rate than any other category. NPE individuals do not fare quite as well, with only a 17-percent success rate.³⁴ We plan to explore a variety of

³³ 2012 PwC Study, *supra* note 7, at 12.

³⁴ This is also consistent with PwC's findings. *Id.* at 26.

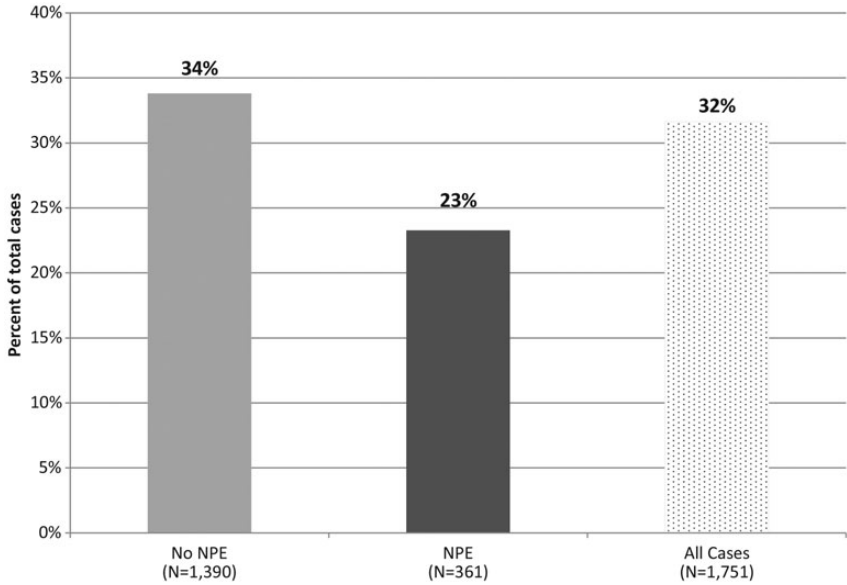


Figure 3. Patent holder success rates, 1995 to 2011

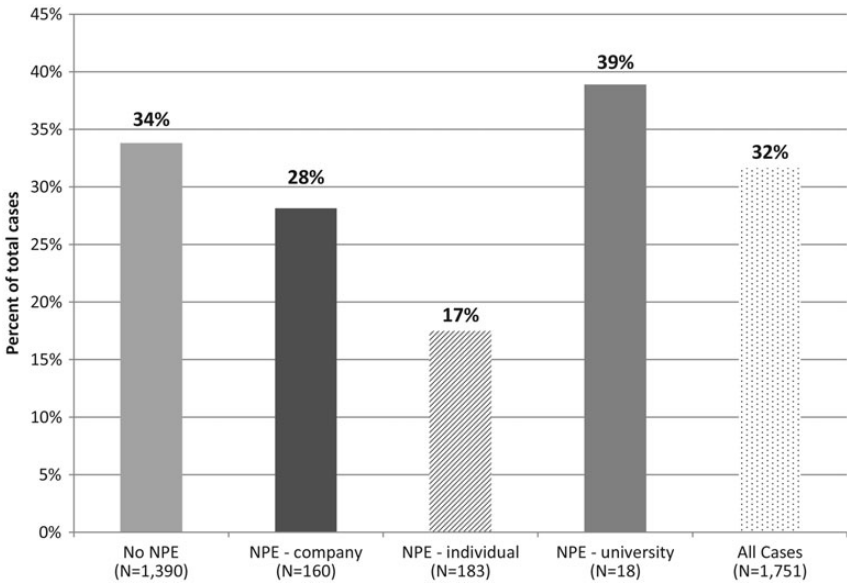


Figure 4. Patent holder success rates with NPE type, 1995 to 2011

potential explanations for this phenomenon, including the possibility that individuals may be more likely to bring lower quality suits or may have fewer resources necessary to obtain a favorable ruling in court. It will also be useful

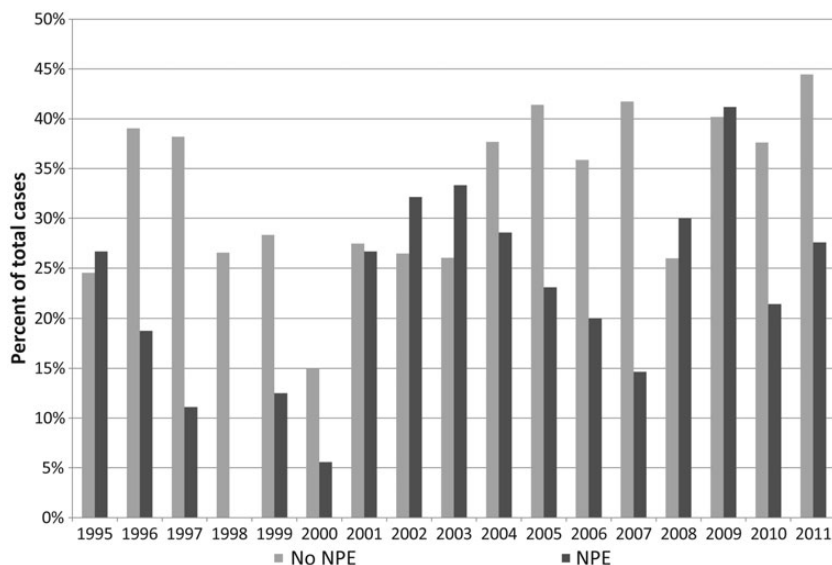


Figure 5. Patent holder success rates by year, 1995 to 2011 (N = 1,751)

to investigate the extent to which the lower success rate of individuals may be tied to the shift from NPE-individuals to NPE-companies that we documented in the previous figure.

As we look over time in the dataset between 1995 and 2011, the trends in patent holder success rates do vary in individual years (Figure 5). For example, in 2002 and 2003, NPEs appear to have higher overall success rates. However, in most years, cases with no NPEs have higher success rates. Even in the years where NPE cases have higher success rates, the difference between the NPE cases and the non-NPE cases is not more than 10 percent.

Generally, we observe that the percentage of cases involving NPEs has not changed, and year over year the success rates between NPE and non-NPE cases are similar (or lower). However, the type of NPE involved does seem to make a difference to the outcome.

D. Awards and Jury Trials

Next, we look at the number of cases in which damages were awarded, and whether the cases were decided by judge or jury. Of the 1,751 cases decided between 1995 and 2011, 554 resulted in a valid and infringed patent. Of those cases, 421 were ANDA cases or had available damages information (Figure 6).

Consistent with the results described in the previous subsections, most of the cases with patent damage awards do not have NPE parties. This is confirmed in Figures 7 and 8, which separate out the total number of cases by NPEs and non-NPEs first and then by each of the NPE categories. It is worth

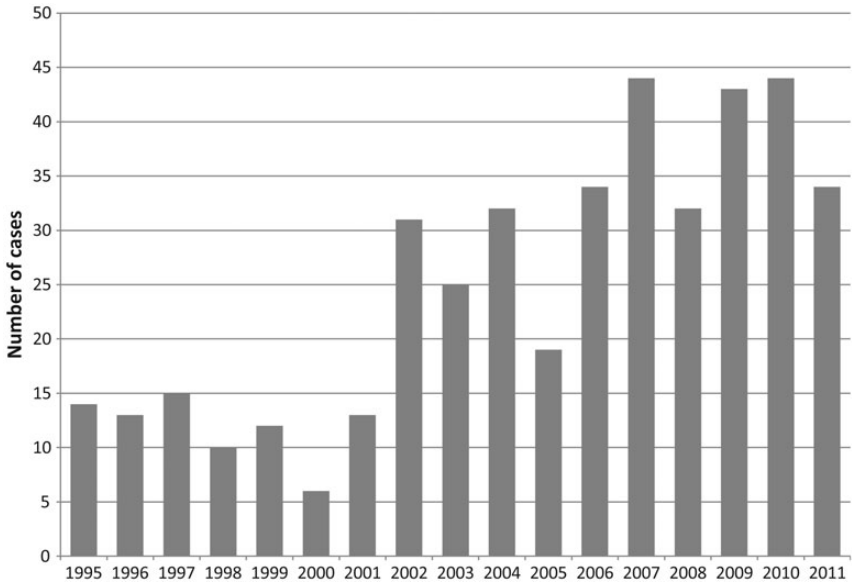


Figure 6. Total patent litigation cases with awards (including ANDA), 1995 to 2011 (N = 421)

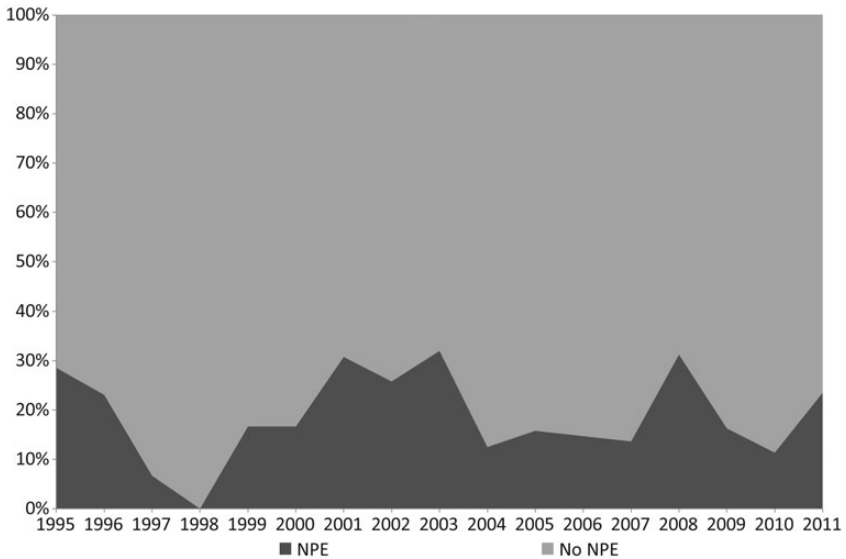


Figure 7. Cases with awards involving an NPE as a percent of all cases with awards, 1995 to 2011 (N = 421)

noting here that of the NPE cases, the NPE companies are most represented among the cases with damage awards. This is especially true in the most recent years of the dataset. As before, we will conduct future research regarding

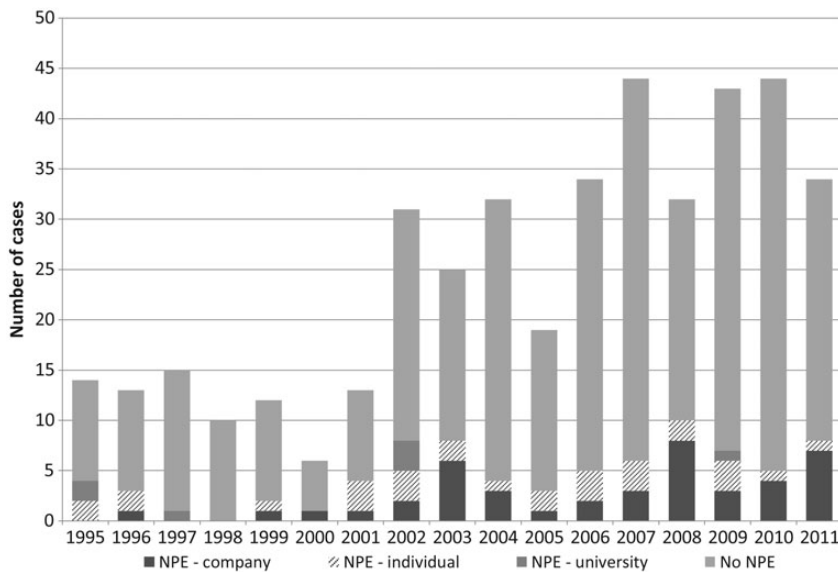


Figure 8. Total patent litigation cases with awards by NPE type (including ANDA), 1995 to 2011 (N = 421)

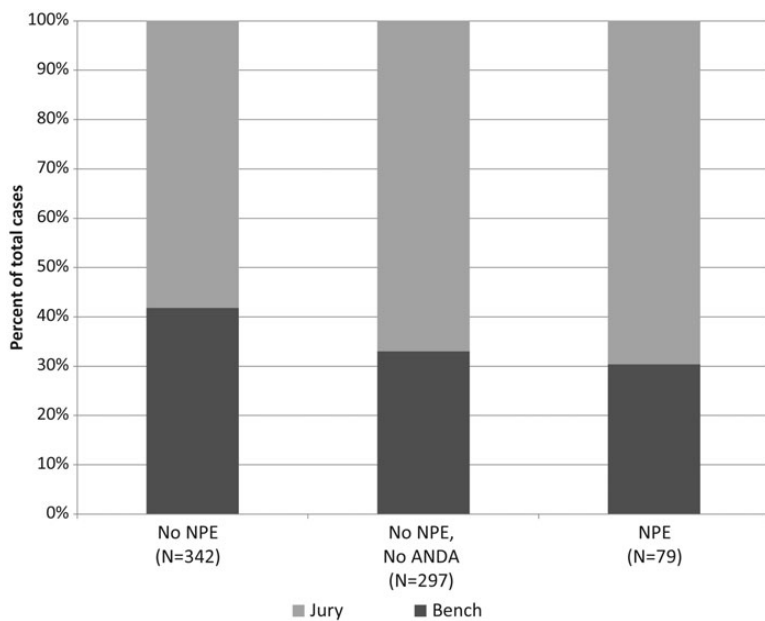


Figure 9. Percent of cases with and without NPEs tried by a jury, 1995 to 2011

Table 1. Damage award distribution, 1995 to 2011 (in millions \$ 2011) (N = 376)

Year	Minimum	First Quartile	Median	Third Quartile	Maximum
1995	\$0.03	\$0.38	\$3.51	\$13.89	\$91.44
1996	\$0.02	\$0.41	\$4.44	\$40.07	\$136.20
1997	\$0.31	\$1.38	\$6.59	\$21.20	\$101.96
1998	\$0.01	\$0.82	\$3.24	\$11.07	\$235.98
1999	\$0.29	\$4.85	\$16.15	\$25.54	\$222.48
2000	\$0.50	\$2.07	\$6.36	\$20.49	\$82.44
2001	\$0.06	\$1.65	\$10.24	\$19.86	\$99.12
2002	\$0.02	\$0.64	\$5.38	\$28.13	\$122.66
2003	\$0.08	\$2.12	\$11.77	\$28.09	\$636.43
2004	\$0.04	\$0.55	\$5.35	\$28.58	\$182.92
2005	\$0.01	\$4.09	\$10.25	\$50.35	\$147.45
2006	\$0.02	\$0.77	\$3.44	\$24.93	\$342.43
2007	\$0.00	\$0.23	\$3.57	\$24.32	\$1,668.59
2008	\$0.01	\$1.19	\$2.96	\$24.01	\$451.20
2009	\$0.03	\$2.54	\$7.35	\$20.46	\$1,937.85
2010	\$0.02	\$0.24	\$1.85	\$16.30	\$109.09
2011	\$0.00	\$0.70	\$8.50	\$31.00	\$593.36

whether the difference between NPE companies and NPE individuals is due to NPE companies' relative sophistication with IP litigation and larger resources and the extent to which this may be causing shifts in the types of NPEs we observe in the data. Also, some of these changes over time could reflect PAEs acquiring patents from individuals and asserting them, which we also plan to investigate in future work.

Because juries have been linked to higher damage awards, another interesting analysis was to determine whether NPE cases were more likely to be decided by a jury. According to Figure 9, there is no difference between the percentage of non-NPE and NPE cases heard by juries (once ANDA cases are removed). Based on these data, there is not much evidence to suggest that differences between NPE and non-NPE cases would be driven by the selection of jury or bench trials. Notably, this result depends on whether ANDA cases are included—with ANDA cases, just under 60 percent of non-NPE cases were heard by a jury, whereas 70 percent of the NPE cases were heard by a jury. However, we believe it is more accurate to exclude ANDA cases, which are necessarily not NPE cases and are only decided on a bench trial, and therefore may skew the results. Excluding the ANDA cases therefore provides a more level comparison.

E. Damages Awarded to NPEs

We turn now to an investigation of the size of damage awards. All awards are in millions of dollars, with dollar values adjusted to account for inflation. All figures are reported in 2011 dollars. Table 1 presents summary statistics, by

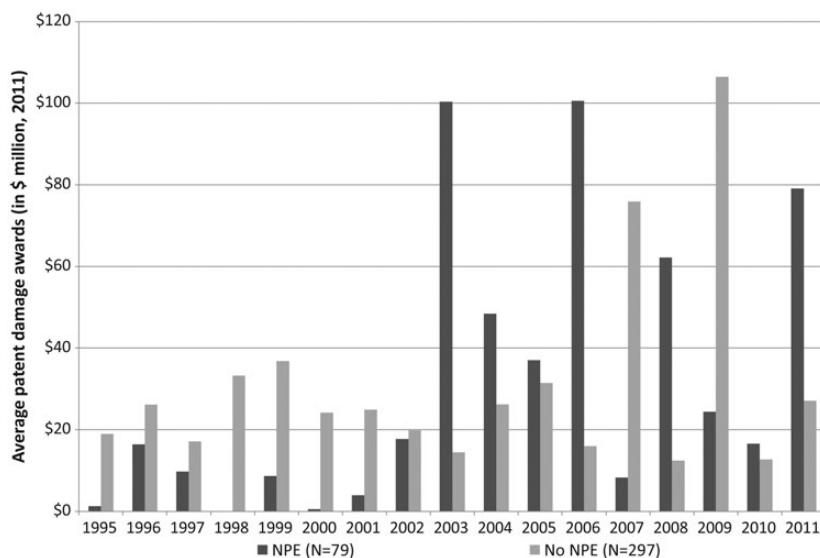


Figure 10. Average patent damage awards for cases with and without NPEs, 1995 to 2011 (N = 376)

year, of the observed distribution of damage award amounts in the dataset, excluding ANDA cases. The main takeaway from this table is that, within any given year, the distribution of damage award amounts is highly skewed.³⁵

As a result, and perhaps as seen more clearly in Figure 10, the averages (or means) vary widely and are highly dependent on a handful of very high awards, such as the over \$1 billion awarded in the Lucent case in 2007 or in the Abbott case in 2009.

The medians, however, are consistent and never rise above \$16 million. Over the period of our data, these medians remain quite stable—refuting claims of a substantial trend toward higher damages that have commonly been made (Table 1). It remains to be seen whether the average and median awards after 2009 have been affected by court decisions that imposed arguably stronger evidentiary burdens to establish damage awards, particularly in reasonable royalty cases benchmarking royalties to prior licenses and not permitting arbitrary percentage rates.³⁶ However, more data are necessary before the effect (if any) of such cases can be tested.

³⁵ These represent an update from a similar table and graph in our previous article on patent damages. The numbers here differ due to minor differences in data collection and because the base was changed from 2008 to 2011. However, our original findings still hold: in each year the damage awards are highly skewed but the medians remain relatively stable.

³⁶ See, e.g., *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1301 (Fed. Cir. 2009); *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860 (Fed. Cir. 2010); *Cornell Univ. v. Hewlett-Packard Co.*, 609 F. Supp. 2d 279 (N.D.N.Y. 2009); *IP Innovation LLC*

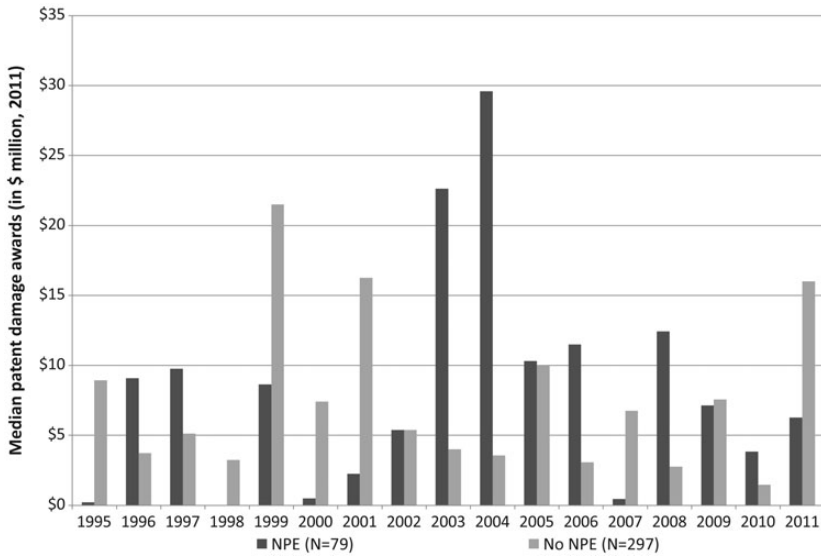


Figure 11. Median patent damage awards for cases with and without NPEs, 1995 to 2011 (N = 376)

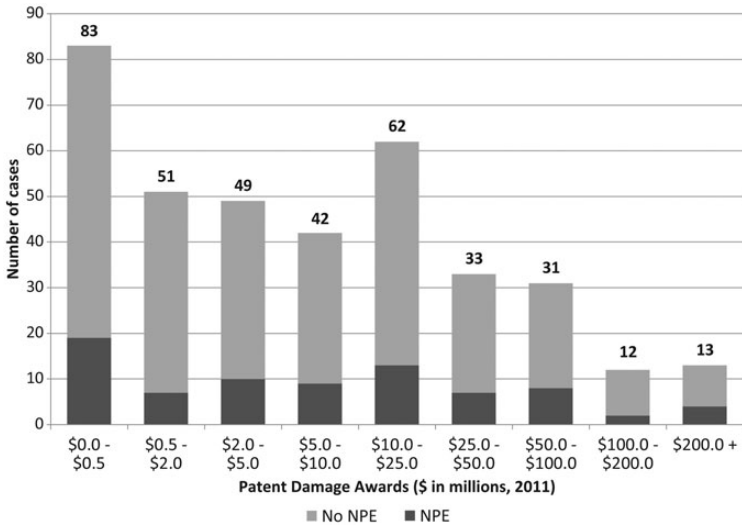


Figure 12. Aggregate distribution of patent damage awards from 1995 to 2011 (N = 376)

v. Red Hat, Inc., 705 F. Supp. 2d 687 (E.D. Tex. 2010); WordTech Sys., Inc. v. Integrated Network Solutions, Inc., 609 F.3d 1308, 1319 (Fed. Cir. 2010); Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1315–18 (Fed. Cir. 2011).

A key question is whether NPE cases result in higher damages than non-NPE cases. In making a comparison between NPEs and non-NPEs on a year-by-year basis, we see that the relative small numbers of cases per year generate an uneven pattern. A quick comparison of means in Figure 10 suggests that NPE cases can result in very high awards, but it is not always the situation that NPEs have higher awards on average. On the whole, this seems to be more consistently true in recent years. Because of the relatively small number of cases annually, we present in the figures below data on medians as well, though the pattern is similarly uneven (Figure 11).

Since the relatively small numbers make year-by-year comparisons of damage awards somewhat problematic, in what follows we aggregate the distribution of damage awards across all the years. The bold numbers represent the aggregate distribution in Figure 12, which shows a very highly skewed distribution of award levels overall. The majority of cases are under \$10 million, and only a small handful (about three percent) are the very large awards over \$200 million. About five times as many awards are in the under \$0.5 million category as are in the over \$200 million category.

In Figure 12, we also separate out each of the award level categories by their NPE or non-NPE status. In each distribution category, NPEs make up between 20 and 30 percent of the total cases. A test for equality of distributions for NPE and non-NPE awards indicates that the two types of cases do not have significantly different distributions.³⁷ This suggests that NPEs may not “matter” insofar as award value is concerned. The regressions in our final section build on this result by further investigating whether NPE cases may be associated with higher (or lower) awards, while controlling for other factors that may help determine the size of individual awards.

F. Regression Analysis

To achieve a more precise picture of the difference between NPE and non-NPE outcomes in patent litigation, it is necessary to control for various factors that may have an impact on the amount of damages awarded across the cases. For example, previous studies, including our previous article, have demonstrated that there is a strong correlation between factors related to the economic value of the patents at issue in the case and the level of damage awards. The financial strength of defendants and other case features have a similar impact. Any measured difference between NPEs and non-NPEs could be misleading if NPEs are systematically over or under-represented among cases with an independent correlation with damage award size.

³⁷ A two-sample Kolmogorov-Smirnov test for the equality of distribution functions resulted in a combined K-S = 0.0782 (p-value = 0.845).

We address this issue by performing a regression analysis on the damage award amount data described above, focusing our attention on the differential impact of NPE presence in the case. Our key explanatory variable, therefore, is an indicator for cases with an NPE litigant. Suitable control variables include proxies for the economic value factors described above—specifically, we include the following in our regression: (1) Number of patents: Individual cases can involve the infringement of multiple patents, with a higher number suggesting the potential for more economic harm. (2) Average age of patents: All else equal, an older patent would have a longer time horizon over which infringement (and therefore harm) may have occurred. (3) Average number of patent claims: Patents with a higher number of claims may be more economically valuable, leading to higher damage awards if validity and infringement are found. (4) Average number of forward citations: The economic value of patents may be positively correlated with the number of times the patent is cited in future patent applications. (5) Defendant is a Public or Fortune 500 Company: These are proxies for the size of the defendant in the case, as larger firms are potentially associated with higher damage awards. (6) Dummy for Jury Trial: Cases decided by juries have been shown to have higher damage awards (perhaps because of the complexity of patent cases or selection bias by patent plaintiffs). (7) Time to Trial: Measured in days, this could represent a measure of the complexity of cases and litigation expenses. (8) Dummy for ANDA Case: This is a control for ANDA cases since they, as a group, behave differently from other patent cases. (9) Year of Decision: This can be used to establish an independent time trend (that is, controlling for the mix of cases) in the damages data.

We run the regression on all of the observations from our dataset for which we have damages data as well as information on all of the variables described above. This limits our dataset to only 261 observations, and we plan to fill in data on more of the observation in future work.³⁸ The signs and statistical significance of the control variables in the regressions reported below are consistent with our conjectures of their potential association with award level outcomes.

As mentioned above, the key explanatory variable of interest in Table 2 is the dummy variable indicating cases in which an NPE is involved. As the results show, the presence of an NPE has a negative effect, but the measure of impact is not statistically significantly different from zero. This means that, if anything, cases brought by NPEs may be associated with lower damage awards once trials are decided. This fact appears consistent with the descriptive analysis above, and it may be indicative of a somewhat less substantial liability threat posed to businesses by NPEs than what is commonly argued.

³⁸ In particular, we have not yet included the data from the most recent years. As such, these regressions only go through 2008.

Table 2. Significant factors influencing damage awards plus NPE dummy, 1995 to 2008

Dependent = Log of patent damage awards in 2008 dollars	Coef.	Robust Std. Error	t	P > t	[95% Conf. Interval]	
<i>Number of Patents</i>	0.15431	0.05085	3.03	0.003	0.05416	0.25446
<i>Average Age of Patent</i>	0.00015	0.00013	1.21	0.228	-0.00010	0.00040
<i>Average Number of Patent Claims</i>	0.01244	0.00466	2.67	0.008	0.00327	0.02161
<i>Average Number of Forward Citations</i>	0.00910	0.00482	1.89	0.060	-0.00039	0.01858
<i>Defendant is a Public Company (or subsidiary)</i>	1.47494	0.38694	3.81	0.000	0.71286	2.23703
<i>Defendant is a Fortune 500 Company (or subsidiary)</i>	0.52510	0.61660	0.85	0.395	-0.68932	1.73953
<i>Dummy for Jury Trial</i>	2.23070	0.59489	3.75	0.000	1.05905	3.40235
<i>Time-to-Trial</i>	0.00087	0.00022	3.95	0.000	0.00044	0.00130
<i>Dummy for ANDA Case</i>	-11.17166	1.13024	-9.88	0.000	-13.39771	-8.94562
<i>Year of Decision (time trend)</i>	-0.15109	0.04824	-3.13	0.002	-0.24610	-0.05607
<i>Dummy for NPE Party</i>	-0.21386	0.33289	-0.64	0.521	-0.86949	0.44177
<i>Constant</i>	313.49580	96.40948	3.25	0.001	123.61380	503.37780

Note: Number of observations: 261; F(11, 249): 31.420; Prob > F: 0.000; R-squared: 0.680; Root MSE: 2.794.

Table 3. Significant factors influencing damage awards plus NPE type dummies, 1995 to 2008

Dependent = Log of patent damage awards in 2008 dollars	Coef.	Robust Std. Error	t	P > t	[95% Conf. Interval]	
<i>Number of Patents</i>	0.14052	0.05319	2.64	0.009	0.03576	0.24529
<i>Average Age of Patent</i>	0.00015	0.00013	1.22	0.224	-0.00009	0.00040
<i>Average Number of Patent Claims</i>	0.01166	0.00453	2.58	0.011	0.00274	0.02057
<i>Average Number of Forward Citations</i>	0.01096	0.00505	2.17	0.031	0.00102	0.02090
<i>Defendant is a Public Company (or subsidiary)</i>	1.44358	0.38951	3.71	0.000	0.67640	2.21076
<i>Defendant is a Fortune 500 Company (or subsidiary)</i>	0.57975	0.62253	0.93	0.353	-0.64640	1.80590
<i>Dummy for Jury Trial</i>	2.19019	0.60042	3.65	0.000	1.00759	3.37280
<i>Time-to-Trial</i>	0.00088	0.00022	3.99	0.000	0.00045	0.00132
<i>Dummy for ANDA Case</i>	-11.18554	1.13653	-9.84	0.000	-13.42407	-8.94702
<i>Year of Decision (time trend)</i>	-0.16340	0.04794	-3.41	0.001	-0.25783	-0.06897
<i>Dummy for NPE - Company Party</i>	0.44731	0.37929	1.18	0.239	-0.29976	1.19437
<i>Dummy for NPE - Individual Party</i>	-0.55742	0.48159	-1.16	0.248	-1.50597	0.39114
<i>Dummy for NPE - University Party</i>	-1.63152	0.92002	-1.77	0.077	-3.44361	0.18057
<i>Constant</i>	338.20810	95.81560	3.53	0.000	149.48830	526.92790

Note: Number of observations: 261; F(13, 247): 27.880; Prob > F: 0.000; R-squared: 0.684; Root MSE: 2.788.

Importantly, our descriptive analysis also suggests that the type of NPE matters with respect to award amount; accordingly, we investigate this further with detailed regressions. To examine whether different kinds of NPEs may have different influences on damage awards, we have included in the regression below (Table 3) a set of NPE dummy variables to indicate whether the NPE is a company, an individual, or a university. These more nuanced results suggest that the negative coefficient on the overall NPE dummy is mainly attributable to the NPE-University and NPE-Individual awards. That is, universities and individuals appear to generally receive lower damage awards compared with NPE companies (or PAEs). Notably, the NPE-University estimated coefficient is significant at the 10-percent level; by contrast, the NPE-Company coefficient is positively signed and is not statistically different from zero.

It is possible that the types of damages awarded in each case influence the regression results. Because lost profit awards may be expected to be higher than reasonable royalty awards,³⁹ and NPEs cannot receive lost profits,⁴⁰ NPE damages could appear lower when all patent cases are considered. To address this question, we ran the same regressions in Tables 2 and 3 on cases where we knew only reasonable royalties had been awarded (this restriction narrowed the number of cases to 122).

We find that our earlier results generally hold for this subgroup. The NPE dummy is negative, but not statistically different from zero (coefficient = -0.231 , $t = -0.66$). When the NPE dummy is broken into its different types, NPE-University is still negative and significant at the 10-percent level and NPE-Company has a positive, but not significant, coefficient.⁴¹

Finally, we wanted to determine whether cases with NPEs resulted in higher infringement awards when a jury decided damages. We again used the same regressions in Tables 2 and 3, but focused on jury cases (the jury dummy was removed). In these regressions there are 166 cases. We find that none of the NPE or NPE subtype variables are statistically significant in this analysis. This suggests that NPEs are not awarded higher (or lower) damages by juries relative to practicing entities, all else equal.

IV. DISCUSSION

We focus on the actual outcomes of litigated cases and try to distinguish differential impacts and trends between cases where patent holders are practicing firms and cases where they are NPEs. Our analysis suggests that decided cases

³⁹ This is due to the fact that infringed patent holders are entitled to damages “in no event less than a reasonable royalty” (see 35 U.S.C. § 284) and so royalties are often the floor for damages.

⁴⁰ NPEs are generally restricted from receiving lost profits because they do not manufacture or market a product that embodies the patent. As such, they do not meet the legal test for an award of lost profits and are limited to reasonable royalties as a damages remedy.

⁴¹ NPE-Company: coefficient = 0.259 , $t = 0.62$; NPE-Individual: coefficient = -0.401 , $t = -0.78$; NPE-University: coefficient = -1.651 , $t = -1.80$. Full regressions are on file with the authors.

involving NPEs do not resolve differently than cases that involve practicing entities as judged along various dimensions. Patent holder success rates are somewhat lower for NPE cases than for non-NPE cases and, controlling for other factors, the damages awarded in cases with valid and infringed patents are somewhat smaller (though not statistically significantly so).

These findings could suggest that concerns regarding NPEs are overstated—they are just not as successful in the end as other patent holders. Or, they may provide evidence that NPEs are enforcing poorer-quality patents or litigating so-called “strike suits” to threaten practicing entities and extort higher settlements. Furthermore, if NPEs are initiating more cases but losing more often than practicing entities, then it may be reasonable to consider the litigation costs attributable to NPEs and whether their practices are imposing an unmerited toll on practicing entities.⁴²

Our findings also suggest that NPE cases are less likely to reach a final decision than cases filed by practicing entities. Specifically, we find that the proportion of NPE cases resulting in final decisions relative to non-NPE cases has not changed significantly over time. This finding should also be viewed in relation to other studies’ observations that filing rates of patent infringement suits have increased and a particular rise is attributable to PAEs. Taken together, these results could reflect a greater willingness on the part of PAEs to settle their patent suits relative to practicing entities.

This observed behavior is consistent with our understanding of PAE incentives with respect to patent suits. By definition, PAEs are not suing their competitors, and their position outside of technology industries may largely exempt them from the politics that often surrounds, and complicates, litigation between practicing entities. Rather, they are vertically separated from practicing companies and the technology embodying their patent rights. Accordingly, PAEs may have fewer reasons to bear the high costs and risks of patent litigation, and may be more likely to approach patent litigation as a means to obtain returns on their patent acquisitions. Settlement may be a more rational decision for such PAEs, even when they hold valid and infringed (and valuable) patent rights. This insight may have critical importance to companies facing suit by PAEs. Moreover, it casts patent assertion by PAEs in a new light, and even suggests that they might employ more efficient forms of patent enforcement than practicing companies.

We also find interesting results when subdividing the NPE patent holders into finer categories. In particular, PAEs are relatively more successful plaintiffs than other types of NPEs. Also, greater success rates have been shifting away from individuals and more toward PAEs. This may reflect the emergence of new firms that aggregate patents or otherwise replace individual patent holders as parties to lawsuits. In turn, this could reflect PAEs providing remuneration to upstream inventors. More generally, it might indicate that PAEs

⁴² See Allison, Lemley & Walker, *supra* note 21; see also Miller, *supra* note 21.

are better at conducting patent litigation than individuals, whether due to larger resources, specialization of focus, a greater degree of separation from technology markets, or other factors. Also, there are other possible explanations for the apparent increase in PAE success rates. As PAEs develop in maturity and sophistication, and as their patent portfolios grow, they may be better positioned to prevail in infringement suits. Additional research could help explain these trends and analyze their possible implications.

Finally, we find that NPE awards are fairly uniformly dispersed across the distribution, and the percentage of NPE awards in each category does not vary significantly. This largely matches the distribution of practicing entity awards. This result is particularly interesting given the incentive structure of NPEs (and PAEs in particular) relative to other litigants. As discussed above, by virtue of their vertical separation from practicing technology industries, PAEs may be expected to approach patent litigation predominantly as a means to a financial end, and may be less likely to have competitive motives associated with their patent suits. On this basis, one might expect PAEs to have a greater selection bias toward higher-value cases and settling out those with lower expected awards. Instead, the observed similarity of distributions suggests that NPEs may not have an informational advantage over practicing entities regarding award value predictions that could allow them to selectively litigate only high-value cases to final decision. Additional research is warranted to investigate further and test this hypothesis.

V. CONCLUSIONS

The fact that NPE damage awards generally, and PAE awards in particular, do not differ significantly from other awards suggests that modern patent assertion practices might not be fundamentally different than traditional forms of patent enforcement. This cuts to the core of the policy debate over PAEs. If PAEs are not obtaining higher awards or awards with significantly different value drivers than practicing entities, then we are not observing a different *type* of patent enforcement on their part. That is, from an awards perspective, “patent assertion” may be no different than other forms of patent litigation. If so, it follows that PAEs are not obtaining “excessive” awards (unless all patent awards are “excessive”), and moreover that PAEs are not exploiting patents illegitimately (unless all patent suits are unjustified).

These results are also important in the context of our previous findings that patent infringement awards are systematically predictable and deterministic. In that prior work, we discovered a high degree of systematic predictability of patent infringement awards, and we concluded that this supports the understanding that the patent is a set of rights subsisting independently from the legal norms that define it.⁴³ Our present findings indicate that the same holds

⁴³ See Mazzeo, Hillel & Zyontz, *supra* note 27.

true for PAE practices. The predictability of PAE remedies, as an indistinguishable subset of other patent infringement remedies, validates at a systematic level the underlying rights so remediated.

Whether or not the modern rise of patent assertion entities, and corresponding increase in patent assertion, are good or bad for technology innovation remains an open question. There is certainly friction between PAEs and practicing technology companies. But it should also be recognized that the vertical separation of patent rights from technology embodied by PAEs could have important advantages. Patent holders without industry ties have incentives to assert their rights indiscriminately and without anticompetitive motivations. Similarly, as the data suggest, they may be more likely to approach patent litigation rationally and settle when favorable royalties can be negotiated.

These findings indicate that patent assertion practices may enjoy certain efficiencies that derive from the separation of patent rights from patented technology. Although PAEs exploit these efficiencies for private gain, this in itself does not justify policy intervention. Moreover, these advantages are not necessarily unavailable to practicing companies. Technology companies may develop novel ways to hold, license, and enforce patent rights that allow them to unlock corresponding new value potential. With the evolving IP marketplace comes the innovation of new practices and new entities that redefine patent rights and the ways they are used.

In future extensions of this work, we plan to press further on the distinction between the NPE categories and connect them to both patent quality as well as litigation outcomes. Controlling for the differences between NPEs will further allow us to suggest particular policies or private strategies to react to the emergence of modern patent assertion practices and business models. We also plan to continue our focus on the structural differences between PAEs and practicing companies and further explore the incentives that motivate their respective approaches to patent litigation.

Returning to our initial impetus for study, the emergence of modern patent assertion practices forces the question: “Do NPEs matter?” This article finds that NPEs *do* matter, although perhaps not in the ways most commonly feared. Award values are not major points of distinction for NPEs compared with practicing entities. Yet, there is evidence that “patent assertion” represents a novel way of exploiting patent rights, and this may have significant implications for patents and modern technology markets.