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Markets and Patent Enforcement: A Comparative Investigation of Non-Practicing Entities in the UnitedStates and Europe

Stefania Fusco
DePaul University College of Law

MARKETS AND PATENT ENFORCEMENT: A COMPARATIVE INVESTIGATION OF NON-PRACTICING ENTITIES IN THE UNITED STATES AND EUROPE

Stefania Fusco†

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Is it true that non-practicing entities (NPEs) are primarily a U.S. phenomenon? Over time, several definitions of NPEs have been presented. They range from research institutions that hold patent portfolios for their inventions but do not develop and commercialize any products, to IP asset management firms whose exclusive business is asserting patent claims to collect significant fees from companies operating in certain industries. The latter are also referred to as "patent trolls" and have been the subject of significant debate as to their role in the innovative process in different fields.

NPEs are a relatively new phenomenon. Studies have shown that their activity has only become prominent in the United States during the last decade. And these studies have suggested that NPEs are not nearly as active in other countries, namely European countries. Nevertheless, no prior research has attempted to quantify the extent of the international NPE problem nor find possible explanations for the difference.

This article investigates whether NPEs are indeed less active in Europe. Interestingly, the findings indicate that NPEs are present in Europe, but their operations there are minimal compared to their operations in the United States. This Article discusses possible explanations for this finding, including a comparative analysis of key differences between European and U.S. industries, remedy systems, and judicial cultures.

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† Visiting Assistant Professor of Law, DePaul University College of Law; Senior Lecturer in Law, Notre Dame Law School; Transatlantic Technology Law Forum Research Fellow, Stanford Law School. I am thankful to Mark A. Lemley, Colleen Chien, Eric Goldman, David Olson, Michael Risch, Thomas Cotter and Tim Holbrook for their precious comments. Thank you to Michael Layton (PatentFreedom) and Raymond Hegarty for contributing valuable information. I am also thankful to Christa Garcia, Enrico Lessona, Markus Burchardi and Richard Graham for excellent research assistance. Finally, thank you to the editors of the *Michigan Telecommunication and Technology Law Review* for their outstanding work. All the remaining mistakes are mine.

This Article demonstrates that NPE activity in Europe is more depressed than in the United States because the affected industries–electronics, machinery and computer equipment, software and communication–are smaller in Europe than on the other side of the Atlantic Ocean. It also shows that NPEs operate in Europe despite *the presence of certain features of local legal systems—such as fee-shifting—that advocates of patent reform have recommended for adoption to control NPE activity in the United States. Consequently, this Article questions the supposed effects of those proposed reforms. Finally, this Article cautions against reforming the current U.S. patent system to make it more similar to European ones, as the European industries targeted by NPEs are less prosperous than their U.S. equivalents. The impact of these proposed reforms on the activities of* practicing *entities has not yet been adequately questioned. Even the question of whether NPE activity is in fact harming innovation has not been conclusively answered. Thus, much more investigation is necessary in this field before it would be wise to reform the patent system.*

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Introduction

Over the past several years, non-practicing entities ("NPEs") have been at the center of an important debate in the United States.[1] This is because

1. *See, e.g.*, Jennifer Kahaulelio Gregory, *The Troll Next Door*, 6 J. Marshall Rev. Intell. Prop. L. 292 (2007) (arguing that the patent troll is not the true problem with the patent system); Michael Risch, *Patent Troll Myths*, 42 Seton Hall L. Rev. 457 (2012) (examining role of NPE in the patent system); Stijepko Tokic, *The Role of Consumers in Deterring Settlement Agreements Based on Invalid Patents: The Case of Non-Practicing Entities*, 2012

NPEs have become significant actors within the U.S. patent system, generating much litigation and controversy.[2] Some of them, sometimes referred to as patent trolls, have achieved success by seemingly undercutting the aims of the patent system. In particular, patent trolls appear to have violated the fundamental *quid pro quo* on which patent law is based: we give you an exclusive right and in return you disclose to the public a new drug, a new machine, or a new process.[3] Trolls have been accused of using patents to extract value from companies operating in certain industries while giving nothing to society in return.[4] Moreover, trolls have been accused of harming innovation.[5] Innovation, the development of new technologies, is fundamentally important to the U.S. economy,[6] which is likely why the press, scholars, and lawmakers have dedicated so much attention to patent trolls.[7]

Until now, scholars have believed patent trolls are almost exclusively confined within U.S. borders.[8] Specifically, European countries appeared immune to the activities of NPEs. Consequently, it became important to find an explanation for this phenomenon.[9] Comparative analysis can be conducted to achieve this goal because it produces particularly useful results in

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STAN. TECH. L. REV. 2 (2012) (arguing for expanding consumer-led private litigation to deter NPE patent settlements based on invalid patents).

2. John R. Allison et al., *Extreme Value or Trolls on Top? The Characteristics of the Most-Litigated Patents*, 158 U. PA. L. REV. 1, 32 (2009) (noting importance of the role non-practicing entities play in the patent system); Elizabeth Pesses, Note, *Patent and Contribution: Bringing the Quid Pro Quo into eBay v. MercExchange*, 11 YALE J.L. & TECH. 309, 328 (2009) ("Nonetheless, patent trolls may actually play an important role in the patent system. For example, many small inventors do not have the financial resources to enforce their patents, and these patents are constantly infringed by larger companies.").

3. *See* Ariad Pharm., Inc. v. Eli Lilly & Co., 598 F.3d 1336, 1354 (Fed. Cir. 2010) ("It is part of the *quid pro quo* of the patent grant and ensures that the public receives a meaningful disclosure in exchange for being excluded from practicing an invention for a period of time."); Colleen V. Chien, *Reforming Software Patents*, 50 HOUS. L. REV. 325, 327 (2012); Tokic, *supra* note 1, at 3 ("The term NPE refers to individuals or entities that simply hold patents they do not practice and, as such, do not make or sell any real product or service."); Miranda Jones, *Permanent Injunction, a Remedy by Any Other Name is Patently Not the Same: How* eBay v. MercExchange *Affects the Patent Right of Non-Practicing Entities*, 14 GEO. MASON L. REV. 1035, 1043 (2007).

4. *See* Jones, *supra* note 3, at 1040-41.

5. *See infra* Part II.A.

6. Andrew Kopelman, Note, *Addressing Questionable Buisness Method Patents Prior to Issuance: A Two-Part Proposal*, 27 CARDOZO L. REV. 2391, 2392 n.6 (2006) ("Moreover, innovation and new technology are often cited as crucial factors currently sustaining the American economy. . . .").

7. *See* Randal R. Rader et al., *Make Patent Trolls Pay in Court*, N.Y. TIMES, Jun. 4, 2013, at A25, *available at* http://www.nytimes.com/2013/06/05/opinion/make-patent-trolls-pay-in-court.html?_r=0.

8. *See* Anna Mayergoyz, Note, *Lessons from Europe on How to Tame U.S. Patent Trolls*, 42 CORNELL INT'L L.J. 241, 244 (2009) (exploring reasons why patent trolls shy away from Europe but are a prevalent problem within the U.S.).

9. *Id.* ("Yet, Europe has remained relatively unscathed by patent trolls.").

cases such as this one, where a problem is present in one country but not in others that have sufficiently similar characteristics.

Thus, comparative analysis is an appropriate approach to study the differences between NPE activity in Europe[10] and in the United States.[11] Significantly, both the United States and European countries have western economies with similar patent policies and interests. In recent history, this similarity of interests became particularly apparent during the negotiations of the TRIPS Agreement. But these similarities can be readily understood also by considering the number of multinational companies that operate both in the United States and in Europe. Moreover, the relevant U.S. and European markets have similar levels of sophistication, and, although there are differences in their respective legal systems, the patent standards adopted in these jurisdictions are substantially harmonized. Despite these similarities, no comparative analysis of NPE activity in the United States and European countries has been conducted yet. Thus, people have speculated about possible reasons that NPEs do not pay much attention to the European market, but no truly convincing story has been produced.

This Article uses comparative analysis to identify which factors truly provide an explanation for the absence—or reduced presence—of patent trolls in Europe. It also examines how these findings inform possible reforms for the U.S. patent system. Part I defines NPEs and briefly summarizes previous studies on patent trolls. Part II explores the presence of NPEs in Europe. Part III illustrates the empirical research conducted for this article and discusses its findings. Part IV shares possible implications of the findings for U.S. patent reform. The Article concludes that NPE activity in a country is related to the level of development of certain industries in that country, that those industries are smaller in Europe, and, therefore, that a reduced presence of trolls in Europe should be expected. This Article also suggests that certain features of European legal systems, which have been the subject of proposed reforms to the U.S. patent system to reduce activity of patent trolls, are not as effective as many commentators and scholars have suggested. Patent trolls are, in fact, active in European countries—albeit at a lower level—notwithstanding the presence of fee-shifting, lower damages awards, and a reduced availability of injunctions (especially cross border injunctions) in their legal systems. Thus, scholars and commentators on NPE

10. "Europe" for the purposes of this paper is intended to comprise member states of the European Union plus Switzerland and Norway. A list of member states is available at http://europa.eu/about-eu/countries/index_en.htm.

11. Sofie Cools, *The Real Difference in Corporate Law Between the United States and Continental Europe: Distribution of Powers*, 30 DEL. J. CORP. L. 697, 703-05 (2005); Christian Kersting, *Corporate Choice of Law–A Comparison of the United States and European Systems and A Proposal for A European Directive*, 28 BROOK. J. INT'L L. 1, 2 (2002); Arthur R. Pinto, *The European Union's Shareholder Voting Rights Directive from an American Perspective: Some Comparisons and Observations*, 32 FORDHAM INT'L L.J. 587, 623 (2009).

activity must ask more fundamental questions about patent reform and the promotion of innovation rather than simply trying to limit NPE operations.[12]

I. Definition

Within the context of patent law, scholars, practitioners and policy makers have offered several definitions of "NPE." The entities included in these definitions range from research institutions that hold patent portfolios for their inventions, but do not develop and commercialize related—or any—products, to IP asset management firms whose exclusive business is asserting patent claims and collecting significant fees from companies operating in certain industries.[13] The latter are also commonly known as "patent trolls" or, more neutrally, patent assertion entities (PAEs)[14] and are the main focus of this Article. References to "NPE" in this article refer primarily to these entities and not universities or other research institutions that, as previously mentioned, could also be considered NPEs.

More precisely, this Article focuses on entities that base their business models on two fundamental activities: acquisition of patents, and the use of those patents for speculative purposes rather than the development of related products and technologies.[15] Most often, this kind of NPE does not even conduct research and development (R&D) activity.[16] They simply create patent portfolios and specialize in enforcing them; in other words, they specialize in identifying users of certain technologies—potential patent infringers—and seek to extract royalty payments from them.[17]

These NPEs acquire their patents from many sources, including small companies, large companies, bankrupt companies, start-ups, solo inventors,

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12. *See* Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 Colum. L. Rev. 2117 (2013).

13. John M. Golden, *''Patent Trolls" and Patent Remedies*, 85 Tex. L. Rev. 2111, 2117 (2007); Todd Klein, eBay v. MercExchange *and* KSR Int'l Co. v. Teleflex, Inc.*: The Supreme Court Wages War Against Patent Trolls*, 112 Penn St. L. Rev. 295, 295-6 (2007) ("'Patent trolls,' also known as 'non-practicing entities' or 'patent holding companies,' are essentially non-manufacturing patent owners who are either individuals or companies that purchase patents and assert them with no intention of creating or manufacturing a product using the patented technology.").

14. *See* Fed. Trade Comm'n, The Evolving IP Marketplaces: Aligning Patent Notice and Remedies with Competition 8 n.5 (2011); Colleen V. Chien, *From Arms Race to Marketplace: The New Complex Patent Ecosystem and Its Implications for the Patent System*, 62 Hastings L.J. 297, 300 (2010). *But see, e.g.*, Sara Jeruss et al., *The America Invents Act 500: Effects of Patent Monetization Entities on US Litigation*, 11 Duke L. & Tech. Rev. 357, 367-68 (2012) (objecting to the use of PAE).

15. Klein, *supra* note 13.

16. Ted Sichelman, *Commercializing Patents*, 62 Stan. L. Rev. 341, 368 (2010) ("First, nonpracticing entities (NPEs)—namely, firms that do not commercialize their patented inventions and perform little to no R & D—are often termed 'patent trolls.'").

17. *Id.* ("[Patent trolls] tend to exploit litigation and licensing market defects to extract unwarranted rents from commercializers, usually on patents that the commercializer was completely unaware of before the NPE's demand for payment.").

hospitals, universities and even the government.[18] Most of the time, they hold their acquired patents for years before asserting them to collect royalties.[19] Commentators have argued that this is because they wait for companies to make irreversible investments in the technologies covered by their patents.[20] A company that has made that kind of investment faces very high switching costs if it were to adopt alternative technologies.[21] In many cases alternatives are not readily available, making the company highly vulnerable to patent trolls' attacks.

The typical scenario begins with an NPE contacting a targeted company through a cease and desist letter accusing the company of infringing one or more of its patents. Soon after, the NPE sends a request for royalty payments to the targeted company leaving the attached entity with three options: (1) stop using the technology (and incur switching costs if alternatives are available); (2) pay royalties to the NPE; or (3) face litigation.[22] Because of the high cost and uncertainty of patent litigation, as well as the cost of switching to an alternative technology, in most cases the targeted company pays royalties to the NPE.[23] Occasionally, an NPE attack does result in patent litigation.[24] But, regardless of the outcome, NPEs can put targeted companies under significant pressure, particularly if the company is a startup with limited resources.

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18. Risch, *supra* note 1, at 498.

19. Tun-Jen Chiang, *A Cost-Benefit Approach to Patent Obviousness*, 82 ST. JOHN'S L. REV. 39, 85 (2009) ("For example, a patentee who publicizes his patent will find it more difficult to practice the widely-criticized 'troll' strategy, where the holder of a patent over a small component waits until an industry sinks large investments in a product incorporating the component and then asserts the patent to extort the value of avoiding forfeiture of that investment.").

20. *Id.*

21. Robert P. Merges & Jeffery M. Kuhn, *An Estoppel Doctrine for Patented Standards*, 97 CAL. L. REV. 1, 14 (2009) ("Rather than asserting the patents at an early stage, the owner waits until the industry is locked in and customer switching costs are high.").

22. David Segal, *How a Typical Patent Battle Took an Unexpected Turn*, N.Y. TIMES, July 13, 2013, at BU5, *available at* http://www.nytimes.com/2013/07/14/business/how-a-typical-patent-battle-took-an-unexpected-turn.html?pagewanted=all&_r=0.

23. J.P. Mello, Legal Update, *Technology Licensing and Patent Trolls*, 12 B.U. J. SCI. & TECH. L. 388, 397 (2006) ("Patent trolls typically demand licenses that are significantly less than the expected cost that each target company will incur in litigation.").

24. *See* Ahmed J. Davis & Karolina Jesien, *The Balance of Power in Patent Law: Moving Towards Effectiveness in Addressing Patent Troll Concerns*, 22 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 835, 836 (2012) ("A typical business model for an NPE is to acquire patents that apply broadly across a particular industry. . . , identify potential infringers, threaten litigation, and then either collect license fees from those entities or bring lawsuits against those that refuse to license. Litigating through trial is usually the last resort. An NPE's real objective in bringing suit is to pressure defendants into early settlements.") (footnote omitted); Colleen V. Chien, *Startups and Patent Trolls* (Santa Clara Univ. Sch. of Law Legal Studies Research Paper Series Working Paper No. 09-12, 2012), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2146251 (arguing that, generally, patent trolls do not have to go that far to sue true small companies).

A. *The Significance of NPE Activity*

To understand the significance of NPE activity, one should consider that in most countries the purpose of patent protection is to foster innovation. In the United States, this is clearly stated in the Constitution, which grants Congress the power "to promote the Progress of Science and useful Arts by securing, for limited times, to . . . inventors, the exclusive right to their . . . discoveries."[25] Similarly, the European Patent Convention (EPC), the regional patent agreement establishing a common procedure to obtain patents in multiple European countries,[26] provides that "European patents shall be granted for any inventions, in all fields of technology."[27] Furthermore, the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), which sets the minimum standards of patent protection for all member states of the World Trade Organization,[28] specifies that "patents shall be available for any inventions, whether products or processes, in all fields of technology."[29]

Thus, patent protection fosters innovation by allowing inventors to practice their inventions free of competition and thereby recoup the investment made to create them.[30] The belief is that, absent patent protection, inventors may engage in far less inventive activity because once an invention is incorporated into a product that reaches the market, it may easily be copied by competitors.[31]

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25. U.S. CONST. art. I, § 8, cl. 8.

26. The EPC establishes a single system to acquire multiple patents across Europe that is parallel to the one present in each country. To join the EPC countries do not need to be EU members. *See, e.g.*, DANIEL C. K. CHOW & EDWARD LEE, INTERNATIONAL INTELLECTUAL PROPERTY: PROBLEMS, CASES, AND MATERIAL 289 (2d ed. 2012) (noting that "in 2011, the EPC had 38 members, of which 27 are part of the EU").

27. European Patent Convention, art. 52(1), Oct. 5, 1973, 1065 U.N.T.S. 199 [hereinafter EPC].

28. CHOW & LEE, *supra* note 26.

29. Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 27(1), Apr. 15, 1994, 1869 U.N.T.S. 299.

30. *See* David S. Olson, *Taking the Utilitarian Basis for Patent Law Seriously: The Case for Restricting Patentable Subject Matter*, 82 TEMP. L. REV. 181, 183 n.1 ("The utilitarian rationale for patent law is set forth explicitly in the Constitution, U.S. CONST. art. I, § 8, cl. 8: 'To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.'"). Moreover, a survey of patent law casebooks shows that law students uniformly learn that our patent system exists to achieve explicitly utilitarian aims, incentivizing the production and distribution of innovation. *See, e.g.*, ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, PATENT LAW AND POLICY: CASES AND MATERIALS 1-13 (6th ed. 2013) (discussing historical use of patents to encourage innovation and protect individual interests); ROBERT P. MERGES ET AL., INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE 127 (4th ed. 2007) (explaining that patents provide incentives to inventors).

31. Olson, *supra* note 30, at 192 ("So long as the cost of copying someone else's invention is less than the cost of inventing, inventors are not incentivized to invent, because they are unable to recover the costs of inventing.").

Patent protection also promotes innovation by encouraging inventors to disclose their inventions to the public.[32] As previously mentioned, without patent protection, inventors fear losing control of their inventions due to competitors' actions and thus may keep them as trade secrets.[33] The result would be reduced access to new inventions by other inventors who might use them to develop other inventions—often in the form of improvements or alternatives to the original invention.[34] Consequently, without patent protection, the overall level of innovation could be depressed.

Moreover, patent protection fosters innovation by increasing the opportunities for an inventor to bring new products to the market.[35] Often, inventors do not have both the resources and the inclination to develop their inventions into finished products, and without patent protection, it would be very difficult for them to reach out to those individuals or entities, such as venture capital firms and large companies, that possess the resources to aid in the process. This is because, once again, inventors would be reluctant to disclose their inventions and risk losing control of them.[36] Also, inventors would certainly have a difficult time convincing venture capital firms to fund a new enterprise without the assurance that competitors cannot threaten their investment. Patent protection significantly reduces that risk by giving the inventor the right to exclude everybody else from the market.

This explains why so much recent attention has been dedicated to NPE activity. Within the context of the promotion of innovation and economic growth, commentators argue that the NPE business model allows these companies to extract value without contributing much benefit to society, either in

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32. *See* WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 294 (2003); Timothy R. Holbrook, *Possession in Patent Law*, 26 SMU L. REV. 123 (2006) (challenging quid pro quo/teaching function); Jeanne C. Fromer, *Patent Disclosure*, 94 IOWA L. REV. 539 (2009) (supporting, with modification, the quid pro quo view); Sean B. Seymore, *The Teaching Function of Patents*, 85 NOTRE DAME L. REV. 621 (2010) (also supporting a modified quid pro quo view); Note, *The Disclosure Function of the Patent System (or Lack Thereof)*, 118 HARV. L. REV. 2007 (2005) (examining role of disclosure in the patent system and the assumption that the patent system encourages disclosure of information that would otherwise remain secret).

33. *See* Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81 (2004); Note, *supra* note 32, at 2010 ("While some suspect that the inventions that are patented are those easy to reverse engineer (and therefore the disclosure is of limited value), others believe patents can still encourage the disclosure of some inventions that would otherwise be kept secret.").

34. Robert G. Bone, *A New Look at Trade Secret Law: Doctrine in Search of Justification*, 86 CALIF. L. REV. 241, 266 (1998) ("If an inventor chooses trade secret instead of patent, others will be denied ready access to the information, access that would exist under patent law. Thus, future innovators will not be able to learn from the scientific and technological insights that led to the original invention, slowing the overall rate of innovation.").

35. Sichelman, *supra* note 16, at 376 (arguing that patents are granted in exchange for a commitment to commercialize a product not available in the marketplace).

36. Olson, *supra* note 30, at 183.

terms of new inventions or new products or services.[37] Thus, NPEs have become controversial entities at the center of an important debate over their ultimate benefit or detriment to innovation. A brief summary of the main arguments in this debate provides a useful background for the research that follows in Part III.

One of the most significant problems caused by NPEs is that they have become so widespread in the United States that companies in certain industries compare the payment of NPE royalties to a tax that they must pay in order to stay in business.[38] Because of both the costs and uncertain results of patent litigation,[39] companies targeted by NPEs are reluctant to fight them in court and, regardless of the merits of an NPE's attack, prefer to pay the amount asked—the "NPE tax"—in the form of royalties.[40] However, this practice harms innovation by making it more expensive.[41] Innovative companies now have to consider a new product development cost, the possible payment of the NPE tax, when they decide whether to develop an innovative product and assess their ability to recoup the necessary R&D investment.[42] The result is a reduced undertaking of innovative new projects.[43]

One study investigated the effect of NPE activity on targeted companies that decide to litigate rather than pay royalties.[44] This study showed that

37. *See* Daniel A. Crane, *Intellectual Liability*, 88 TEX. L. REV. 253, 286 (2009) (noting that NPEs and product companies "have asymmetrical incentives, since trolls are only interested in exacting payments whereas commercializers often resolve infringement disputes with other commercializers through cross-licensing arrangements"); Mark Liang, *The Aftermath of* TS Tech*: The End of Forum Shopping in Patent Litigation and Implications for Non-Practicing Entities*, 19 TEX. INTELL. PROP. L.J. 29, 37 (2010) ("In contrast, most NPEs do not innovate, nor do they practice or commercialize their patents to benefit society."); Brian J. Love, *An Empirical Study of Patent Litigation Timing: Could a Patent Term Reduction Decimate Trolls Without Harming Innovators?*, 161 U. PA. L. REV. 1309, 1359 (2013).

38. Ashley Chuang, Note, *Fixing Failures of Software Patent Protection: Deterring Patent Trolling by Appliying Industry-Specific Patentability Standards*, 16 S. CAL. INTERDISC. L.J. 215, 232 (2006) ("Although the patent troll negotiates settlements and licensing fees for itself, its activity limits and impairs public access to inventions by clogging the legal system, deterring resources from innovation, imposing additional costs within a target company's operations, and obligating end users to a hidden tax on technology products.").

39. Mello, *supra* note 23, at 392.

40. *See* Davis & Jesien, *supra* note 24, at 837-38.

41. *See* Robert P. Merges, *The Trouble with Trolls: Innovation, Rent-Seeking, and Patent Law Reform*, 24 BERKELEY TECH. L.J. 1583, 1600 (2009) ("The analogy to spurious personal injury settlements or nuisance suits brings home the key point: The market for patents unconnected to innovation is not a market that the legal system ought to encourage or even tolerate.").

42. *See* Davis & Jesien, *supra* note 24, at 837-38.

43. *Id.*

44. James Bessen et al., *The Private and Social Cost of Patent Trolls* 2 (Bos. Univ. Sch. of Law, Law & Economics Research Paper No. 11-45, 2011), *available at* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1930272. The same authors also considered the costs of NPE litigations in a subsequent article. James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes*, 99 CORNELL L. REV. 387 (2014). *But see* David Schwartz & Jay Kesan, *Analyzing the Role of Non-Practicing Entities in the Patent System* 99 CORNELL L.

"NPE lawsuits are associated with half a trillion dollars of lost wealth to defendants from 1990 through 2010 [and that, in particular] during the last four years, the lost wealth has averaged over $80 billion per year."[45] It also showed that defendants in these lawsuits "are mostly technology companies who invest heavily in R&D."[46] Finally, it concluded that "to the extent . . . litigation represents an unavoidable business cost to technology developers . . . these lawsuits substantially reduce [the targeted companies'] incentive to innovate."[47]

Moreover, NPE activity has also faced criticism for discouraging new entrants in certain markets.[48] Commentators have maintained that when inventors and entrepreneurs decide whether to enter a market in which the NPE presence is significant—typically technology markets—they may decide to redirect their interest towards less hostile environments or other activities.[49] Inevitably, a reduced presence of innovators in the targeted markets translates into less innovation in related industries.

On the other side of this debate, some scholars and commentators argue instead that NPEs might not harm innovation—to the contrary, they might benefit it.[50] In fact, some suggest that NPEs create a secondary market for inventors, particularly small inventors, which otherwise would have a difficult time recouping their R&D investment.[51] Supporters of this viewpoint

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REV. 425, 425 (2014) (criticizing the studies of Bessen and Meurer by stating that "[their] stud[ies] present[ ] new data on the litigation costs and settlement expenses incurred by a subset of defendants in NPE cases. Some of their findings are provocative, but we find their methodology to be deficient in several respects, which limits the usefulness of the data and thus the implications that can be drawn from them.").

45. *See* Bessen et al., *supra* note 44, at 2.

46. *Id.*

47. *Id.* Certainly troll litigation represents a significant cost for innovative companies, but this part of the Bessen study might face criticism for not providing an explanation on how troll litigation blocks innovation more than any other patent litigation. *See also* Risch, *supra* note 1.

48. *See e.g.*, Ian David McClure, *Commoditizing Intellectual Property Rights: The Practicability of a Commercialized and Transparent International IPR Market and the Need for International Standards*, 6 BUFF. INTELL. PROP. L.J. 13, 31 ("[B]ut sellers might be dissuaded from entering the market for fear of selling to an [intellectual property rights] "troll," resulting in a restraint of trade.").

49. *See id.*

50. *See* Gerard N. Magliocca, *Blackberries and Barnyards: Patent Trolls and the Perils of Innovation*, 82 NOTRE DAME L. REV. 1809, 1810 (2007) ("[S]o-called trolls spur innovation by investing in undercapitalized projects and reducing transaction costs for small inventors who are routinely robbed by large corporations."); Ronald J. Mann, *Do Patents Facilitate Financing in the Software Industry?*, 83 TEX. L. REV. 961, 1024 (2005) ("[T]rolls are serving a function as intermediaries that specialize in litigation to exploit the value of patents that cannot be exploited effectively by those that have originally obtained them. That is not in and of itself a bad thing.").

51. *See* Risch, *supra* note 1, at 491 ("A primary justification of NPEs is that they provide an aftermarket for patents of failed (and even going) companies, providing a new liquidity option that enhances investment in startups."); *see also* Sannu K. Shrestha, Note, *Trolls or*

argue that small inventors often do not have the resources to both develop the invention into a final product and pursue infringers.[52] Thus, even if they hold a patent, they lack the ability to use that patent as a source of income. NPEs solve this problem by providing small inventors an alternative, less traditional, way to monetize their patents. This view maintains that NPEs provide a higher chance of recouping inventors' R&D expenditure, which ultimately produces more incentive to engage in additional creative activity.[53] Critics of this argument note that the benefits NPEs produce—through the creation of a secondary market for patents—must be measured against the increase in the cost of innovation created by NPE enforcement activity.[54] Consequently, the net effect of NPE activity is very hard to determine.[55]

In conclusion, the studies present in the literature indicate that NPEs make innovation more expensive while, at the same time, creating a secondary market for inventors with an uncertain beneficial effect. If this is true, NPEs could be very harmful in countries, such as the United States, where the economies rely heavily on the development of new technologies. Certainly, the presence of NPEs contributes to rendering these new technologies less competitive, both domestically and internationally. Therefore, it is important to learn and understand as much as possible about the way NPEs function. Shedding light on how differences in the American and European markets relate to the characteristics of NPE activities in those countries is one step in that direction.

II. Is It True That NPEs Are Not Present In Europe?

Many reports suggest that NPEs are absent in Europe.[56] As far as litigation involving NPEs, it appears that nothing is going on in Europe aside from the famous IPCom case discussed later. Is this true? The answer is no. NPEs *are* present in Europe, but their activity is modest compared to their activity in the US. Consequently, they do not receive the same attention

Market-Makers? An Empirical Analysis of Nonpracticing Entities, 110 Colum. L. Rev. 114, 119-31 (2010) (providing an overview of relevant literature and competing arguments).

52. Suzanne Konrad, *The United States First-to-Invent System: Economic Justifications for Maintaining the Status Quo*, 82 Chi.-Kent L. Rev. 1629, 1651 (2007) ("If small businesses and individual inventors feel that they will never prevail in obtaining a patent because they do not have the resources to compete with larger companies, they will lose the incentive to invest the initial costs required to develop a technology.").

53. *See* Magliocca, *supra* note 50, at 1810.

54. Chien, *supra* note 24, at 14 (describing the obstacles to small firms' monetization).

55. *Id.*

56. Mayergoyz, *supra* note 8, at 257 ("Surprisingly that is not the case. Although Europe had glimpses of patent troll attacks, its innovators and technology industry generally do not suffer from the same abuses as their U.S. counterparts."). *Cf.* Victoria E. Luxardo, *Towards a Solution to the Problem of Illegitimate Patent Enforcement Practices in the United States: An Equitable Affirmative Defense of "Fair Use" In Patent*, 20 Emory Int'l L. Rev. 791, 802 (2006) ("[W]arning signs are beginning to show up that the patent troll practice may be heading abroad to Europe.").

from the media, scholars, and commentators, and can operate almost undetected.

The examination of NPEs that target the European market and NPE litigation in Germany and Italy helps to illustrate the reality of the NPE presence in Europe.

A. *NPEs That Operate in Europe*

A total of twenty-five NPEs are reported to operate in Europe (see Table 1 below). The names of these companies has been generously provided by PatentFreedom,[57] an organization that gathers and analyzes data about NPE activity, and provides that data to its subscribers. PatentFreedom's clients are mostly companies that operate in industries targeted by NPEs.[58] These companies use the information obtained by PatentFreedom to assess and manage the risk of NPE activity, and, in the case of an NPE attack, counter that attack effectively.

PatentFreedom compiled this list of NPEs using information gathered through interaction with its clients.[59] Thus, the nature of this data is anecdotal and its illustrative power is limited. In particular, this data might not account for possible NPE attacks directed to companies other than PatentFreedom's clients. However, the nature and magnitude of PatentFreedom's client base[60] combined with its experience in the systematic collection of information about NPEs makes this list very valuable. In addition, PatentFreedom's list has the significant advantage of resulting from direct experiences with NPEs operating in Europe, and—in addition to information on litigation—includes licensing activity, which has been reported to be the most significant part of these operations.[61] This is significant because NPE

57. Email from Michael Layton, Director, patentfreedom.com, to Stefania Fusco, Visiting Assistant Professor at Law, DePaul Univ. College Law (May 31, 2012, 08:27 CST) (on file with author).

58. *Global Reach*, PATENTFREEDOM https://www.patentfreedom.com/about/global/ (last visited October 4, 2013) ("Many of the world's most-pursued companies subscribe to PatentFreedom. Increasingly they are joined by small-to-medium sized companies seeking to assess and address specific NPE risks in a cost effective fashion and by leading law firms seeking to deliver exemplary advice and client service. Our clients come from all of the world and from a range of industries, including computer software, computer hardware, consumer electronics, semiconductor, telecommunications, financial services, retail, automotive, consumer goods and utilities."); *see also Most Pursued Companies*, PATENTFREEDOM https://www.patentfreedom.com/about-npes/pursued/ (last visited October 4, 2013).

59. For the United States, PatentFreedom collects and analyzes litigation data. PatentFreedom does not collect litigation data outside the United States in a systematic fashion, because the existence and quality of data varies considerably in foreign countries. Also, litigation data can be very hard to access abroad.

60. *See Global Reach supra* note 58; *Most Pursued Companies*, *supra* note 58.

61. Telephone Interview with Raymond Hegarty, Head of European Oerations, Intelectual Venture (May 24, 2012) (noting that scholars focus their investigations exclusively on the litigation part of the NPEs's activity when the licensing part is more substantial); *see also*, Thomas F. Cotter, Global Perspectives on Patent Law 18 (July 26, 2012) (unpublished manu-

licensing activity both in the United States and Europe has been almost entirely disregarded by scholars and commentators, mostly because of the difficulty in gaining access to relevant information.[62]

TABLE 1. LIST OF NPES OPERATING IN EUROPE

NPE	Location
Ablaise Ltd	UK
Adamasu Gebre	Netherlands
Alliacense	UK
APRIM Innovation	France
Arendi Holding Ltd	Spain and Norway
ArrivalStar	Luxembourg
Beacon Navigation GmbH	Switzerland
Crossroads Systems Inc	Germany
Hakan Lans	Sweden
Inpro Licensing	Luxembourg
IPCom GmbH & Co	Germany
IPG Healthcare 501 Limited	UK and Guernsey
Media Patents (fka Semantic Components SL)	Spain
Mobility Patent Holding	Finland
Mondis Technology Ltd	UK
Monec Holding	Switzerland
Nonend Inventions	Netherlands
Orlaford Ltd	Ireland
Papst Licensing GmbH	Germany
Rambus	Germany and UK
Samy Gharb	Switzerland
Semiconductor Ideas To The Market BV (ItoM)	Netherlands
Sisvel/Audio MPEG	Italy and Germany
Suomen Colorize Oy	Finland
Turtle Bay Technologies	UK

Table 2 below shows that the European countries with the highest number of operating NPEs are: the United Kingdom, Germany, Switzerland, and the Netherlands.[63]

script) (on file with author) ("[I]n all patent systems, litigation is the exception not the rule. . . .").

62. Risch *supra* note 1, at 468 ("While the focus is on active NPEs, this study excludes large but nonlitigious NPEs, such as Intellectual Ventures, for a few reasons. First, and most practically, quality data is not as available.") (footnote omitted).

63. Email from Michael Layton, *supra* note 58. For the U.S., see *Largest Patent Holdings*, PATENTFREEDOM, https://www.patentfreedom.com/about-npes/holdings/ (last visited March 24, 2013) ("Of the more than 750 NPEs profiled by PatentFreedom as of January 2014, only 45 are known to hold more than 100 active patent publications in their portfolios.").

TABLE 2. NUMBER OF NPES PER EUROPEAN COUNTRY

Country	Number of NPEs
United Kingdom	6
Germany	5
Switzerland	3
Netherlands	3
Luxembourg	2
Finland	2
Spain	2
France	1
Sweden	1
Italy	1
Norway	1
Ireland	1

This list demonstrates that, contrary to consensus and to reports in the literature, NPEs are present in Europe. Their level of activity, however, is much lower when compared to NPE activity levels the United States. This Article will look more closely at two countries in the list in Table 2—one with a high number of reported NPEs and another with a low number of reported NPEs. These countries are Italy, because of the author's preexisting familiarity with its legal system, and Germany, because it is the European country with the highest number of filings of patent infringement actions per year[64]—and, consequently, is probably the jurisdiction with the highest likelihood of containing NPE litigation activity. Focusing on NPE litigation activity here is particularly useful, because patent litigation is the exception, not the rule.[65] Thus, if NPE litigation activity is found in Italy and Germany, it is almost certain NPE licensing activity is present as well in those countries.

Italy

To determine the level of NPE litigation activity in Italy, cases were obtained from a search of four Italian legal databases[66] containing cases from both civil and criminal courts. The objective of this search was to find cases in which at least one of the NPEs listed by PatentFreedom was involved. The search covered from 2000 to 2012, and produced five cases in which one of the following NPEs was a party:

64. Cotter, *supra* note 61, at 1. For an analysis of patent licensing activity in Europe, see Maria Pluvia Zuniga & Dominique Guellec, *Who Licenses Out Patents and Why? Lesson from a Business Survey*, 11 (OECD STI Working Paper 2009/5), *available at* http://www.oecd.org/science/inno/42477187.pdf ("Licensing out patents is practiced by a significant share of firms holding patents: 35% in Europe. . . .").

65. Cotter, *supra* note 61, at 18.

66. The Italian databases are DeJure, Il Foro Italiano, Leggi d'Italia and InfoLeges.

- Sisvel (2011)[67]
- IPCom (2009)[68]
- Sisvel (2008)[69]
- Sisvel (2008)[70]
- Rambus (2000)[71]

The number of Italian patent cases involving at least one NPE between the years 2000 and 2012 is staggeringly low, particularly if one considers that, on average, 100 patent infringement actions are filed in Italy every year.[72]

Germany

To determine the level of NPE litigation activity in Germany, the investigation consisted of searching for German cases involving at least one of the NPEs listed by PatentFreedom. German courts, however, do not report a party's name in their decisions, so rather than searching legal databases for patent cases, the investigation involved an extensive search of news reports from a wide range of sources.

The result is once again staggering. The search produced 5 "reports" from 2000 to 2012. The NPEs involved are listed below:

- Papst Licensing (2012)[73]
- Alliance (2011)[74]
- IPCom (2007)[75]

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67. *K.E. Srl.*, case n. 211 (December 15, 2011) in DeJure (on file with author).
68. *Research In Motion Ltd., Research In Motion UK Ltd., Research In Motion France S.A.S., Research In Motion Deutschland Gmbh, Research In Motion Netherlands B.V., Research In Motion Belgium Bvba, Research In Motion Spain S.L.,* case n. 5119 (December 15, 2011) in DeJure (on file with author).
69. *B.J.*, case n. 1132 (November 8, 2008) in DeJure (on file with author).
70. *DEMARSON Electronics zrt di Budapest*, case n. 2186/07 (January 19, 2018) in DeJure (on file with author).
71. *Micron Technology Inc., Micron Technology Italia Srl.* (December 27, 2000) in Foro Italiano (on file with author).
72. Cotter, *supra* note 61 at 17.
73. *Achtjähriger Rechtsstreit findet sein Ende*, Weinheimer Nachrichten & Odenwälder Zeitung, http://www.wnoz.de/druck.php?WNOZID=5ovg2ns0qjrg496ajk6f60deo5kat=88&artikel=110050268&red=27&ausgabe= (last visited Oct. 6, 2013).
74. Von Jan Hildebrand, *Raubzug der Patenthaie*, Die Welt (February 23, 2009), http://www.welt.de/welt_print/article3254842/Raubzug-der-Patenthaie.html.
75. *Nokia, HTC: IPCom Verliert, Smartphones Bleiben*, Chip Online (April 25, 2012, 16:30), http://business.chip.de/news/Nokia-HTC-IPCom-verliert-Smartphones-bleiben_55573245.html.

- Sisvel (2007)[76]
- Intro Licensing (2006)[77]

As previously mentioned, however, NPE litigation is just one aspect of the overall NPE operation. In fact, one author reports that "only 0.12 to 0.19 percent of the patents in force in Germany in 2008 were the subject of infringement actions filed in Germany that year."[78] Thus, it can be assumed that the NPE presence in Germany in terms of licensing activity must be much higher than what emerged from this part of the investigation. Yet, when compared to the U.S. level of NPE litigation activity,[79] the number of Italian and German cases involving NPEs is very modest. An investigation of the distribution of targeted companies in Europe will help provide an explanation for these results.

III. Why Is NPE Activity Depressed in Europe?

There is very little literature offering possible explanations for the reduced activity of NPEs in Europe compared to the United States.[80] This paper represents the only empirical study on this topic currently available. A brief description of the relevant literature and how it applies to the famous IPCom case follows, to properly frame the empirical investigation that is the center of this article.

A. *Literature*

The most common explanations for the reduced presence of NPEs in Europe rely on differences between the American and European legal systems; in particular, the availability of certain types of injunctions and different levels of damages awarded in patent cases.[81]

Another recurring explanation is the absence in Europe of a single jurisdiction for patent litigation. Currently, patents granted by the European Patent Office (EPO) exist independently in each EPC member state. This means

76. *Patentstreit Mündet in Lizenznahme Durch Bosch*, Juve (Feb. 22, 2008), http://www.juve.de/nachrichten/verfahren/2008/02/patentstreit-muendet-in-lizenznahme-durch-bosch.

77. *Patentstreit: Lovells und Reimann Osterrieth Erringen Teilerfolg für BlackBerry-Hersteller und T-Mobile*, Juve (Feb. 9, 2006), http://www.juve.de/nachrichten/verfahren/2006/02/patentstreit-lovells-und-reimann-osterrieth-erringen-teilerfolg-fuer-blackberry-hersteller-und-t-mobile.

78. Cotter, *supra* note 61, at 18 (in Germany the average number of filings of patent infringement actions per year is 1,000 per year).

79. Bessen et al., *supra* note 44, at 3.

80. Joe Brennan et al., *Patent Trolls in the US, Japan, Taiwan and Europe*, CASRIP Newsletter (Spring/Summer 2006), *available at* http://www.law.washington.edu/Casrip/Newsletter/default.aspx?year=2006&article=newsv13i2BrennanEtAl; Tim Pohlmann & Marieke Opitz, *Typology of the Patent Troll Business*, 43 R&D Mgmt. 103 (2013).

81. *See* Cotter, *supra* note 61, at 28.

that owners of a European patent must seek enforcement separately in each European jurisdiction. On February 19, 2013, however, twenty-five EU countries signed the *Agreement on a Unified Patent Court,*[82] supporting the creation of a single patent court for European patents. The Agreement will take effect if ratified by thirteen countries;[83] France, Germany and the United Kingdom, the countries where most European patents are registered, must ratify the agreement for it to enter into force.

These factors certainly have an impact on NPE activity in different markets. An NPE's activity is not substantially different from any other investment activity and thus, damages, injunctions and the complexity of litigation are important to consider when calculating the risk and return of its operations. However, these elements *alone* cannot entirely explain the reduced presence of NPEs in Europe. All else being equal, an investor—such as an NPE—will undertake a certain operation regardless of the specific level of recoverable damages and available injunctions or the complexity of litigation as long as the expected return is higher than any other alternative investment opportunity with equivalent risk.

Thus, the question becomes: what other factors *outside patent law* "make the difference"? I believe that these other potential factors are: (1) the availability of funding specifically for NPE activity,[84] (2) culture, and (3) the size of the targeted market.

The famous IPCom case, in which a German NPE attacked Nokia with the hope of generating 12 billion euros, confirms the importance of the "availability of funding" factor.

The IPCom Case

IPCom is a German NPE created in 2007 to enforce Bosch's portfolio of patents related to the telecommunications industry. More specifically, IPCom is a "special purpose entity" created by Bosch to shield it from counterclaims and the risk of fee shifting while it asserted patents. Between 2007 and 2008, IPCom tried to reach a licensing agreement with Nokia.[85] The IPCom portfolio includes a number of patents that are essential for GSM standards. The Rules set by the European Telecommunication Standards In-

82. *Unified Patent Court*, EUR. CT. OFF. (March 6, 2013), http://www.epo.org/law-practice/unitary/patent-court.html.

83. Austria has been the first EU country to ratify the agreement. *Spindelegger: "New EU patent will trigger innovation boost for EU"*, AUSTRIAN FOREIGN MINISTRY (August 8, 2013), http://www.bmeia.gv.at/en/foreign-ministry/news/press-releases/2013/spindelegger-neues-eu-patent-bringt-innovationsschub-fuer-die-eu.html.

84. In the literature, commentators specifically referred to the presence of VCs and differences in the Capital Market. The famous IPCom case seems to confirm the importance of this point. *See supra* notes 85-89 and accompanying text.

85. *See* Press Release, IPCom, Nokia Loses Essential Patent Case Against IPCom, Threatening Sale of Nokia 3G Phones in UK, (June 16, 2011), *available at* http://www.ipcom-munich.com/pdf/110616_IPCom_Patent100a_UK.pdf.

stitute (ETSI) require that these be licensed on fair, reasonable and non-discriminatory (FRAND) terms.[86] Nokia interpreted the FRAND rate to be one percent of its mobile phone sales, but IPCom asked for five percent. Soon after, negotiations failed and the two companies are currently litigating in a number of countries, including Germany, Italy, and the United Kingdom.[87]

This case has attracted much attention from the European and U.S. media. For the purpose of this Article, the IPCom case is interesting because it could indicate that domestic funding for NPE activity is unavailable or at least very limited in Europe. In fact, fifty percent of IPCom's operation was not funded by European investment, but by Fortress Investment Group, a private equity firm based in New York City.[88] In recent years, U.S. hedge funds have been crucial in financing NPE activities.[89] That Fortress, rather than a European hedge fund, is sponsoring this case, and that this is a significant operation involving the patent portfolio of an important European company, might indicate that European investors are not yet ready to invest in NPE activity.

One could conclude that the reluctance of European investors renders NPE operations in Europe more difficult, which helps explain the lower level of trolling activity in that market. It is important to note, however, that just as IPCom managed to access foreign funding, other NPEs could as well. Thus, this factor alone does not adequately account for the modest presence of trolls in Europe. The more relevant and more powerful factor is the size of the relevant NPE market.

B. *Distribution of "Target Companies" in Europe*

Previous studies have shown that NPEs operating in the U.S. market target companies in specific industries.[90] For instance, Bessen and Meurer

86. *Id.*

87. *See Nokia Loses Appeal to Overturn 3G Patent*, CELLULAR NEWS (May 14, 2012), http://www.cellular-news.com/story/54392.php.

88. *See Fortress-Backed Company Sues Nokia Over Patents*, REUTERS (Jan. 30, 2008, 3:29 PM), http://www.reuters.com/article/2008/01/30/nokia-patents-idUSL3084752820080130.

89. *See* Nathan Vardi, *Patent Pirates*, FORBES (May 07, 2007), http://www.forbes.com/free_forbes/2007/0507/044.html.

90. *See e.g.*, FED. TRADE COMM'N, *supra* note 14, at 162-63; 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, 1608-09 (2009); Colleen V. Chien, *Predicting Patent Litigation*, 90 TEX. L. REV. 283, 323 (2011); Colleen V. Chien & Mark A. Lemley, *Patent Holdup, the Itc, and the Public Interest*, 98 CORNELL L. REV. 1, 30 (2012) (discussing NPE activity before the ITC); Michael J. Meurer, *Controlling Opportunistic and Anti-Competitive Intellectual Property Litigation*, 44 B.C. L. REV. 509, 542 (2003); *Exposure by Industry*, PATENT FREEDOM, https://www.patentfreedom.com/about-npes/industry/ (last visited Mar. 4, 2013) ("NPE patent enforcement used to be an issue that really only affected companies in the classic high technology sector – hardware, software, semiconductors, communications, and consumer

showed that in 22% of U.S. NPE cases the defendant was a company with an SIC[91] code number equal to 36 (electronics); in 15% of cases it was a company with an SIC code number equal to 35 (machinery and computer equipment); in 15% of cases it was a company with an SIC code number between 50 to 59 (retail/wholesale); in 14% of cases it was a company with an SIC code number equal to 73 (software); in 9% of cases it was a company with an SIC code number equal to 48 (communication); and in 8% of cases it was a company with an SIC code number between 60 to 67 (financial service).[92]

Thus, this Article relies on my study of the relationship between the presence of the patent trolls identified by PatentFreedom, as discussed in Part II, and the distribution of potential target companies within the European Union—*i.e.*, the distribution of companies with an SIC number that previous studies have shown to indicate the preferred targets of NPEs. A detailed description of this part of the research follows.

Method

The first step of this investigation involved the creation of a list of publicly traded European companies with an SIC code number equal to 35 (machinery and computer equipment), 36 (electronics), 48 (communication), or 73 (software). The distribution of companies with an SIC code of 50 to 59 (retail/wholesale) and 60 to 67 (financial services) were disregarded because, in Europe, patents on business methods and financial methods are much more difficult to obtain than in the United States—thus, considering companies operating in industries in which those patents are most relevant could skew the results of this part of the research.[93]

This initial list of potential NPE targets was created by retrieving information about European company revenues and SIC codes from Compustat.[94] The list of relevant companies is organized by country and their 2010 reve-

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electronics. That is no longer the case, as NPEs are increasingly bringing patent enforcement actions against the users and sellers of technology, as well the producers."); *see also* Brad Stone, *Engineers Fight Patent Reform, Not Patent Trolls*, *Bits Blog*, N.Y. TIMES (Aug. 30, 2007, 2:52PM), http://bits.blogs.nytimes.com/2007/08/30/engineers-fight-patent-reform-not-patent-trolls/ (stating that high-technology companies are pushing for weaker patent rights to fend off trolls, whereas pharmaceutical companies are pushing for stronger patent rights that they can enforce).

91. For an overview of the SIC system, see *Standard Industrial Classification (SIC) System*, U.S. CENSUS BUREAU, http://www.census.gov/epcd/www/sic.html (last visited Mar. 24, 2014).

92. Bessen, *supra* note 44, at 30.

93. *Id.*; *see also* EPC, art. 52(2)(c), Oct. 5, 1973, 1065 U.N.T.S. 199 ("The following in particular shall not be regarded as inventions within the meaning of paragraph 1: (c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers").

94. *Compustat Financials*, S&P CAPITAL IQ, https://www.capitaliq.com/home/what-we-offer/information-you-need/financials-valuation/compustat-financials.aspx (last visited Oct. 6, 2013).

nues have been converted from their national currency into U.S. dollars, adjusted to the value in 2010. Finally, the "average revenue" and "cumulative revenue" produced by the identified companies in each country during the year 2010 were calculated. The resulting data and relative analysis are reported below.

Data and Analysis

This subpart presents the research on the distribution of potential target companies of NPEs in Europe, including the number of companies per country, their 2010 average revenues, and their 2010 cumulative revenues. Table 3 summarizes these findings.

TABLE 3. DISTRIBUTION OF COMPANIES WITH SIC CODES 35, 36, 48 AND 73

Countries	Average Revenue (million)[1]	Cumulative Revenue (million)[2]	Count[3]	GDP (billion)[4]
Austria	960.5524011	17289.94322	18	376
Belgium	770.6325378	17724.54837	23	465
Switzerland	**1891.409239**	**107810.3266**	**57**	**523**
Cyprus	170.0899483	680.3597932	4	23
Czech Republic	3014.150469	3014.150469	1	195
Germany	**974.9041927**	**230077.3895**	**236**	**3,315**
Denmark	688.241166	22711.95848	33	312
Spain	**4617.079557**	**106192.8298**	**23**	**1,409**
Estonia	54.79369053	54.79369053	1	NA
Finland	**2067.237821**	**95092.93975**	**46**	**239**
France	**1311.437896**	**275401.9582**	**210**	**2,582**
United Kingdom	**633.009764**	**217755.3588**	**344**	**2,247**
Greece	420.7260891	7993.795693	19	305
Hungary	1504.712376	3009.424752	2	132
Ireland	**91.22668453**	**273.6800536**	**3**	**204**
Italy	**1175.7539**	**65842.21837**	**56**	**2,055**
Lithuania	184.9008566	554.7025698	3	36
Luxemburg	**3965.437209**	**15861.74884**	**4**	**54**
Latvia	8.604672606	34.41869042	4	24
Malta	93.7041128	187.4082256	2	8
Netherlands	**3708.082043**	**118658.6254**	**32**	**738**
Norway	**718.6776485**	**28028.42829**	**39**	**414**
Poland	159.9690723	13117.46393	82	468
Portugal	825.2847229	7427.562506	9	229
Slovakia	170.5580098	170.5580098	1	87
Slovenia	1488.631393	2977.262785	2	47
Sweden	**901.2673543**	**133387.5684**	**148**	**455**

[1] Average revenue produced by relevant companies in 2010.

[2] Cumulative revenue produced by relevant companies per country in 2010.

[3] Number of relevant companies per country.

[4] Country's 2010 GDP.

The countries in this table listed in bold are those in which Patent-Freedom has reported trolling activity. Therefore, the obvious question is: why do trolls ignore countries such as Austria, Belgium, Poland and Portugal?

As discussed previously, the existing literature tries to explain results like this by looking at differences between the legal systems of these countries. Countries in Europe, however, have substantially uniform patent law systems–either because they are part of the European Union or because they are members of treaties such as the Strasbourg Patent Convention. Certainly, some differences are still present between the patent laws of different countries, but both the nature and extent of those differences cannot explain the presence of patent trolls in certain European countries and not others.

Another possible explanation for the absence of patent trolls in certain European countries may be found in differences between the cultures of different countries—specifically, the extent to which a country will consider patents as possible assets for speculation. In fact, it has been argued that under the utilitarian view of patent protection (the predominant view in the United States), the separation of the patent from the inventor (such as the transfer of a patent to an NPE) and the patent's use for objectives other than developing the described invention should be easier than under the natural rights view.[95] This is because, under the utilitarian view, a patent is just a tool to recoup the inventor's R&D costs and selling a patent to an NPE is within a range of activities that makes this possible.[96] To the contrary, the natural rights view of patent protection should render the aforementioned separation more difficult,[97] as this view focuses on the close relationship that exists between the inventor and his or her creation.[98] Under this view, the invention is almost considered a discrete part of its creator, and the patent allows the inventor to exercise control over it.[99] Thus, for the inventor, transferring the patent to an NPE is equivalent to losing control over part of oneself.

However, virtually all of the European countries are part of the civil law tradition, in which natural justice also comes into play when justifying patent protection. In fact, the natural rights theory of patent law is predominant

95. John M. Golden, *Principles for Patent Remedies*, 88 TEX. L. REV. 505, 520 (2010) ("[A] standard utilitarian argument is that patents help correct for market failures that would otherwise erode incentives to develop new technologies.").

96. *Id.* ("An inventor or innovator frequently must incur considerable expense and take on substantial risk, whether in generating an inventive idea or in developing an effective mode of commercializing such an idea. But if unprotected information regarding the invention and its mode of commercialization is made public through, for example, sale of a consumer product, multiple users might compete with the original innovator in exploiting that information. Without special protection, free riders might drive the proceeds from the originator's investment to zero.").

97. *See* A. Samuel Oddi, *TRIPS–Natural Rights and "A Polite Form of Economic Imperialism"*, 29 VAND. J. TRANSNAT'L L. 415, 427 (1996) (discussing two lines of reasoning offered as natural rights justifications; first occupancy for the inventor who discovers or creates an invention being entitled morally to its exclusive use; and labor justification for the inventor who labors in creating an invention being entitled morally to the fruits of that labor).

98. *Id.* at 428.

99. *Id.*

not only in the few European countries in which NPE operations are unreported, but also those in which patent trolls are present. Similarly, the absence of venture capital for trolling activity does not seem to characterize only those European countries in which NPEs are absent.

Another possible explanation could be that patent trolls operate only in the wealthier countries. After all, the purpose of trolling activity is to extract value, and Germany, France, and the United Kingdom have the largest economies in Europe. If we look closer at the list of European countries with NPEs, however, this hypothesis does not carry much explanatory power. Table 3 provides a better explanation for this result.

If, for instance, one compares Belgium with Finland, we see that in 2010 Belgium's GDP was 465 billion dollars, whereas Finland's was 239 billion dollars. Patent trolls are reported to be present in Finland, but not in Belgium, which has a higher GDP. On the other hand, if one considers the different industries of the two countries it can be seen that in 2010 there were 23 companies in Belgium with a SIC code number equal to 36, 35, 48 and 73 that produced, in aggregate, revenues of almost 18 billion dollars. At the same time, in Finland there were 46 companies in the same industries that produced, in aggregate, revenues of more than 95 billion dollars.

Poland is another interesting case. Poland's GDP in 2010 was 468 million dollars—the same as Sweden and Norway. Patent trolls are reported to operate in Sweden and Norway, but not in Poland. In 2010, Poland had 82 companies in the relevant industries—Norway had only 39 companies. In the same year, however, Polish companies produced, in aggregate, revenues equal to 13.2 billion dollars, while companies in Norway produced, in aggregate, 28 billion dollars—more than twice as much as their counterparts in Poland.

The data suggests that markets with high revenue producing companies operating in certain industries attract trolls. In fact, with the exception of Ireland, NPEs in Europe are present in those countries in which revenue from the selected industries are the highest. Table 4 supports this further.

TABLE 4. NPE PRESENCE RELATIVE TO TOTAL REVENUE PRODUCED IN 2010

Industry	Presence of NPEs by Total Revenue
Electronics, Machinery & Computer Equipment, Software, Communication	92%
Software	96%
Electronics	94%
Machinery & Computer Equipment	93%
Communication	89%

Patent trolls are present in European countries that have companies responsible for 92% of the revenues in electronics, machinery, computer equipment, software and communication. Looking at the software industry alone, trolls cover a region in Europe in which 96% of the industry's revenue is produced.

Europe Versus the United States

Given the patent trolls' clear interest in companies producing high revenues, it is unsurprising that trolling activity is depressed in Europe compared to the United States. In fact, as illustrated in Table 5, in 2010 Europe had a total of 1,402 companies in the relevant industries that produced total revenues of about 1.49 million dollars. On the other hand, the United States had 1,331 companies that produced total revenue of about $2.33 million dollars. In other words, that portion of the U.S. market most attractive to trolling is 36% bigger than the equivalent portion of the European market.

TABLE 5. DISTRIBUTION OF RELEVANT COMPANIES AND REVENUES (EUROPE VS. THE UNITED STATES)

	Europe	**United States**
Total Companies	1402	1331
Total Revenues	$1,491,331.423	$2,331,323.228
High Revenue Companies	29	46

Finally, in 2010, Europe had 29 companies that produced revenues higher than $10 billion whereas the United States had 46.[100] The final part of this article discusses how these findings can be used to develop effective reforms in other legal systems, and the U.S. patent system in particular.

IV. POSSIBLE IMPLICATIONS FOR U.S. PATENT REFORM

Is the U.S. patent system failing?[101] In recent years, the press, lawmakers, and scholars have expressed significant disappointments with the system, and raised doubts about its ability to achieve the goal of promoting innovation.[102] These commentators have typically blamed patent trolling for this,[103] and thus have proposed a number of reforms to limit NPE activity in the United States.[104] This Part contains a brief discussion of the relevance of this Article's findings to the proposed reforms.

100. *Id.*
101. Chien, *supra* note 3, at 329.
102. *See, e.g.*, *id.*
103. *See id.* at 329-30.
104. *See id.* at 351-90.

A. *What Can Be Learned from Europe?*

Comparative studies, such as the one presented herein, seek to produce knowledge that can be employed for some practical purpose.[105] In particular, comparative studies are used when some specific, novel, and difficult problem emerges and there is disagreement about the best way to solve it.[106] In those cases, one approach is to analyze how that problem has been handled in other contexts and learn from that.

When considering alternative contexts, those engaging in a comparative study do not usually look for solutions. Instead, they look for a deeper understanding of the general problem underlying the specific comparison.[107] When, as in the case of NPEs, the problem involves multiple countries, one engaged in comparative study seeks a deeper understanding by looking at various ways in which that problem manifests itself abroad—for instance, by looking at various ways in which NPEs operate in foreign countries. "The hope is that the experience of countries at comparable stages of social and economic development will [provide] insight into [the domestic] situation and . . . help . . . to find . . . [an autonomous] 'path through the forest.'"[108]

Therefore, there are two questions that emerge from this investigation: First, based on NPE activity in Europe, what have we learned about NPEs? Second, how can we use that information to "find our own path" in dealing with trolling activity in the United States?

The answer to the first question can be summarized in three main points:

1. Less favorable legal environments do not stop NPEs from entering related markets. As we have seen, NPEs operate in Europe, notwithstanding the fact that in European countries the damages awarded are lower and the availability of cross-border injunctions is more limited.

2. NPE presence in different markets is industry related. In fact, once we control for other factors such as the differences in legal regimes, culture, and access to funding, the only plausible explanation for the presence of NPEs in certain countries and not others is the distribution of companies operating in relevant industries.

3. NPE activity is concentrated in markets where potential target companies produce high revenues. NPEs do not operate in

105. Mary Ann Glendon et al., Comparative Legal Traditions 5 (3d ed. 2008).

106. *Id.* at 7 ("Comparative law frequently proves its worth through significant contributions to specific, novel, and difficult problems").

107. *Id.* ("What they are usually looking for is, initially, a deepened understanding of the problem, and, if they are lucky, a source of inspiration.").

108. *Id.* at 8.

countries, such as Poland, where the number of companies operating in the preferred industries is high, but revenues are low.

As for the second question, as previously mentioned, many have recently called for a number of patent reforms in the United States to solve the patent trolling issue.[109] The proposed reforms include, among others, shifting litigation costs to losing parties, eliminating software patents, and reducing damage awards.[110] The information about NPE activity gathered through this research can shed some light on which of these proposals might be successful. While a full analysis of these proposed reforms is beyond the scope of this Article, a few considerations can be made. In particular, this research suggests that changes modeled after the European legal systems might only produce marginal effects in the United States. This is because fee-shifting, lower levels of damages, and a reduced availability of cross border injunctions are all already present in European countries, and yet NPEs operate there regardless. More importantly, as discussed above, these features of European legal systems do not fully explain the presence of NPEs in certain markets, but not others. One possible explanation is that trolling activity is characterized by very high profit margins. If so, certain characteristics of European patent systems may render patent trolling riskier in Europe than in the United States, but the returns must be adequate. Consequently, it appears that, to effectively address patent trolling in the United States, more direct regulation of NPE activity is necessary. Merely adopting certain characteristics of European legal systems is insufficient.

One final point can be made regarding proposals to reduce patent trolling in the United States by eliminating software patents. While software patents do have characteristics that favor the practices of NPEs,[111] this research shows that trolling activity in Europe has also been reported in 94% of the Electronics market, 93% of the Machinery & Computer Equipment market, and 89% of the Communication market.[112] Although it is hard to determine the precise distribution of NPE activity across these markets, one can infer that eliminating software patents might reduce patent trolling to some extent, but most certainly would not solve the problem.

Conclusions

Notwithstanding what many people believe, patent trolls are indeed present in Europe. The level of their activity, however, is modest compared to patent troll activity in the United States.

The collected data indicates that one possible explanation for the reduced presence in Europe is the distribution and strength of target compa-

109. *See* Chien, *supra* note 3, at 351-90.
110. *Id.*
111. Bessen et al., *supra* note 44, at 34-35.
112. *See supra* Table 4.

nies. Other factors, such as differences in the legal systems, the availability of funding, and cultural differences, may also be relevant, but to a much lower degree. In fact, European countries have very similar patent law systems and culture. Moreover, access to venture capital does not change significantly from one country to another. Thus, the distribution of target companies with high revenues seems to provide the best explanation for the presence of NPEs in certain markets, but not others. Consequently, as the concentration of potential target companies is 36% higher in the United States than in Europe, a lower level of trolling activity in Europe compared to the United States is not surprising.

Comparative investigations are conducted to understand certain problems and to use that information for practical purposes. A full discussion of how the findings of this research could be used to inform patent reform in the United States is beyond the scope of this article. But some preliminary suggestions are possible. In particular, NPE activity in the United States should be addressed through direct and compressive regulation, rather than the adoption of certain characteristics of the European legal systems. In European countries, fee-shifting, lower damages awards, and a reduced availability of cross-border injunctive relief in particular are already present, yet trolls continue to operate. While the level of troll activity in European markets is lower than in the United States, the level of development of the target industries in European markets is also lower. Thus, a more fundamental question is: if the purpose of the patent system is to spur innovation, why replicate the patent systems of countries that are less innovative than the United States?

NPEs appear to be the inevitable "byproduct" of the successful development of certain industries. Reducing these entities' activities could risk that success, particularly when less invasive solutions that do not substantially alter the current system can be tried first. The main objection to regulation that singles out NPEs and limits their ability to enforce patents, is that the term "NPE" encompasses companies operating under a wide variety of business models and not all of these models involve extracting value from other companies without giving anything back to society. Some NPEs contribute a substantial amount of knowledge in the form of cutting edge research. Others go even further and develop inventions at what could be considered an "embryonic" level. Thus, the difficulty is one of line-drawing: how do we properly target only the undesirable NPE activity?

This is clearly a problem, but the legislature and courts are not new to these kinds of challenges. This Article shows, however, that European experiences caution against adopting solutions that might turn out to be less advantageous than initially thought.