Mind the Gap: Economic Costs and Innovation Perils in the Space Between Patent and Competition Law

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1. Introduction: The Theory and The Problem ................................................................. 1
3. The Gap Dwellers: Patent Trolls .............................................................................. 3
   (a) What are Patent Trolls? ..................................................................................... 4
   (b) The Emergence of Patent Trolls ....................................................................... 5
      (i) The Rise of Multiple-Patent Products ......................................................... 6
      (ii) Systemic Problems in Patent Issuance and Quality .................................. 7
      (iii) The Spreading Troll Phenomenon .............................................................. 8
   (c) In Defence of Patent Trolls ............................................................................. 10
4. Exploiting the Gap: The Impact on Competition and Innovation ......................... 12
   (a) Asymmetry of Litigation Risk ......................................................................... 14
   (b) The Hold-up Problem ..................................................................................... 17
   (c) The Exclusionary Value and the Technology Value of Patents .................... 21
5. Addressing the Gap ................................................................................................. 22
   (a) Market Responses ......................................................................................... 22
      (i) Defensive Patent Aggregation ...................................................................... 23
      (ii) Standard Setting Organizations ................................................................. 24
      (iii) Patent Pools .............................................................................................. 25
   (b) Judicial Responses ......................................................................................... 26
      (i) eBay Restricts the Availability of Injunctions .......................................... 26
      (ii) The Patent Misuse Defence ...................................................................... 28
   (c) Legislative Responses: The Leahy-Smith America Invents Act .......... 30
   (d) Regulatory Agency Responses ...................................................................... 32
      (i) Guidance from Antitrust Agencies ............................................................. 32
      (ii) Enforcement by Antitrust Agencies .......................................................... 34
      (iii) Patent Regulation Reform ...................................................................... 35
6. Conclusion ............................................................................................................. 36
1. Introduction\(^1\): The Theory and the Problem

"[T]he aims and objectives of patent and antitrust laws may seem, at first glance, wholly at odds. However, the two bodies of law are actually complementary, as both are aimed at encouraging innovation, industry and competition.\(^2\)

As the U.S. Federal Circuit Court explains above, the legal regimes of competition law and patent law act as complementary instruments in the pursuit of innovation and consumer welfare. Antitrust law and policy strive to maintain competitive markets, prohibiting unreasonable restraints on trade that could act as barriers to new innovation. Robust and effective competition in turn drives competitors to improve existing products or introduce new products to maintain their market share. Meanwhile, patent law and policy aim to foster long-term dynamic efficiency through incentives to invest and innovate over time. Patent law grants enforceable property rights to inventors which, as a reward for disclosure of the invention, allow the owners of the patent to unilaterally exclude others from using the property.\(^3\) The patent system promotes innovation by providing incentives for owners to invest in the creation and development of new inventions, as well as by making the invention available to the public to promote build-on innovation.\(^4\)

Although competition and patent regimes share the same goals of innovation and related economic and consumer benefits, tensions at the interface between these areas of law have often been considered. The well-recognized challenge is to permit the legitimate exercise of patent rights while continuing to enforce competition laws where anti-competitive practices involve patent rights. But what happens where both regimes are implicated and yet neither effectively controls conduct that harms innovation and imposes economic costs? How do we compare the cost/benefit trade-off of addressing the problem via the competition system, patent system or

\(^1\) The authors thank Charles Tingley, a partner at Davies Ward Phillips and Vineberg LLP and Chris Hannesson, an articling student at Davies Ward Phillips and Vineberg LLP, for their assistance with this paper and Dr. Robert Harris for his insightful review. All errors, omissions and opinions are our own.

\(^2\) Atari Games Corp. v. Nintendo of America, Inc., 897 F.2d 1572, 1576 (Fed. Cir. 1990), as cited in the U.S. Department of Justice & Federal Trade Commission Antitrust Guidelines for the Licensing of Intellectual Property section 1.0 (1995) [U.S. IP Guidelines]; see also Address by R. Hewitt Pate, Assistant Attorney General Antitrust Division U.S. Department of Justice, Promoting Economic Growth Through Competition And Innovation, presented at the Chinese Academy of Social Sciences, Institute of Law Beijing, China, July 1, 2004: "The pressure of competition can spur innovation and so can the promise of exclusive intellectual property rights… In any event, patent policy and competition policy share the same goal, to improve consumer welfare, and should be considered complementary instruments in the pursuit of that goal."; OECD Policy Roundtables, Competition, Patent and Innovation (2006), online: OECD <http://www.oecd.org/dataoecd/26/10/39888509.pdf>.

\(^3\) This trade-off is explained in the original language of the U.S. Constitution, indicating Congress shall have the power "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries", U.S. Const. art 1, §8, cl.8.

both? When intellectual property laws are being used to impede innovation should competition law intervene?

This article considers a gap between patent law and competition law that is being profitably exploited by "patent trolls", firms whose business is the acquisition and assertion of patents against parties who are already using the patented technology.5 First, we frame the discussion by considering the interaction of competition law and patent law and how the interaction can, in theory, impact innovation. Then we look at the example of patent trolls and how they are taking advantage of an absence of competition and patent law enforcement: what they are, the reasons for their recent emergence and the main arguments in defence of patent trolling. Next we examine the economic cost and harm to innovation caused by patent trolls in the context of wider issues in competition and patent law and policy, including asymmetry of litigation risk, the hold-up problem and the growing valuation of patents based on the right to exclude rather than the economic value of the underlying invention. Finally, we survey the efforts to stem patent abuse, including patent trolling, through market, judicial, legislative and regulatory means. Regardless of the source of the solution, be it patent or competition law or policy, patent trolling highlights a clear need for reform to achieve the innovation goals of both the competition and patent regimes. Law makers, enforcement agencies, regulators and the courts need to bridge the ever-widening gap.

2. Innovation and the Interaction of Competition Law and Patent Law

To optimize the promotion of innovation and consumer welfare, competition law and patent law need to be aligned in both design and enforcement. The legitimate practicing of patents must be accommodated by competition law or it will undermine the patent system's incentives to innovate. Conversely, the improper use of patents has the potential to chill innovation, reduce competition and raise prices through unnecessary litigation and licensing.6 As a recent U.S. Federal Trade Commission Report, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* ("FTC Report"), explains, the ability of antitrust and patent laws to strike a balance that promotes innovation is greatly impacted by patent quality and patent notice, as well as the appropriateness of patent remedies.7

High quality patents are valid, clear and appropriate in claim scope, while low quality patents are vague, overbroad and may be invalid.8 Low quality patents tend to disrupt the patent-antitrust balance because they make it difficult for potential competitors to determine a clear path for

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6 *Ibid.* at 3-5.


follow-on innovation, deterring later competition. Poor patent quality is more likely to lead to unnecessary litigation, with the cost of litigation reflected in higher consumer prices. In contrast, high patent quality promotes the balance between the exclusivity granted by patent law and the competition maintained by antitrust law.

Poor patent notice, which can stem from poor patent quality, also undermines innovation and competition by raising the risk of inadvertent patent infringement by firms. Proper and sufficient patent notice delineates the scope of the patent by setting out the "metes and bounds" of the right to exclude and the potential reach of claims emerging from the patent. Proper patent notice promotes innovation by encouraging collaboration, technology transfer and design-around of existing patents. Where the notice function of patents fails, it inhibits competition and innovation because potential collaborators or licensees are left unable to find or determine the scope of relevant patents. Firms may hesitate to commercialize technology given uncertain royalty costs and the risk of expensive patent infringement litigation. For example, a firm may choose not to pursue research and development for a product when it is unclear whether another firm holds a key patent that could be used to block product sales, or where the licensing cost of the final product cannot be determined with reasonable certainty. This type of uncertainty negatively impacts the level of innovation and reduces competition from the product that might otherwise have been developed, with a concomitant consumer welfare loss.

Appropriate patent remedies also play a key role in the balance of competition and patent law. A fundamental tenet of the patent system is the right of the patent holder to seek a remedy for patent infringement, which protects the patent holder's ability to earn returns in the market in exchange for their invention. Where remedies over or under-compensate the patent holder, the impact can be detrimental to innovation and competition. If patent holders are under-compensated, the incentive to invent is reduced and fewer innovative products and services can be expected. Over-compensation of patent holders can hamper competition and innovation incentives by enabling the extraction of disproportionately high economic rents.

3. The Gap Dwellers: Patent Trolls

The distortion and deterrence of competition and innovation, as discussed above and in the FTC Report, are more likely to occur where patent holders' activities are driven by poor patent quality, weak patent notice and remedies that are disproportionate to the economic value of the patented invention. Patent trolling relies on all of these issues with patent law, yet it has not been

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11 FTC Report 2011, supra note 5 at 3.

12 Dr. Robert G. Harris, Patent Thickets and Co-Patentees: Implications of Injunctions and Holdups for Innovation (January 29, 2012) [Harris, Patent Thickets].
addressed to any extent by antitrust authorities, making it the perfect illustration of the pressing problems in the gap between patent and competition regimes.

(a) What Are Patent Trolls?

A "typical" firm conducts research, obtains the related patents and applies the patented technology to produce a product or service. Such firms are referred to as "producing entities" in the discussion of patent trolls, because their business includes turning inventions into useful innovations. In contrast, patent trolls are firms whose primary business activity is the acquisition of patents, from inventors or on the secondary patent market, for the purpose of enforcement against parties that are already using the patented technology. Patent trolls are neither creators nor consumers of the technology underlying the patent; they generally do not conduct research or practice their acquired patents. Trolls also tend to rely heavily on actual or threatened litigation to extract patent licensing royalties or settlements.

An example of a firm sometimes labelled as a patent troll is the private equity-backed Digitude Innovations ("Digitude"). The company's mission statement is to build its patent portfolio (currently in the range of 550 patents) through the purchase of patents, then license the patents to industry-leading technology companies, thereby "offering patent owners a new and innovative way to monetize their intellectual property assets". The only "innovation" pursued by patent

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13 Or, if not all three stages, a producing entity is typically involved in the value creation at either the first research stage or the final production stage.

14 John Johnson et al, "Don't Feed the Trolls?" (September 2007) online at: NERA <http://www.nera.com/extImage/PUB_DontFeedTheTrolls.pdf>


16 Raymond Millien & Ron Laurie, Meet the Middlemen (2008), Intellectual Asset Management February/March 2008 at 53, albeit in reference to all intellectual property intermediaries rather than just trolls [Millien & Laurie].

17 Other examples of companies with large patent portfolios that are sometimes labelled as "trolls" are Acacia Technologies, LLC (http://acaciatechnologies.com/) and Round Rock Research LLC (http://www.roundrockresearch.com/). Patent Freedom identifies over 500 examples of "non-producing entities", online: Patent Freedom <https://www.patentfreedom.com/about-npes/holdings/>.

18 Online: Digitude Innovation <http://www.digitudeinnovations.com/news.html>. See for example Digitude's recently filed suit with the U.S. International Trade Commission, claiming patent infringement and seeking an injunction that bars the entry into the U.S. of the allegedly infringing handsets of Research in Motion
trolls is in finding new ways to monetize patent rights and not by producing innovative products that rely on patented technology.

A range of terminology has sprung up to parse the entities involved in the "secondary patent market" – the market where patents are bought, sold and licensed as assets, the value of which depends on the rent that can be extracted. To complicate matters, companies involved in the secondary patent market fall on a spectrum between a practicing entity and a troll, and there are conflicting opinions on which entities are truly "trolls". One distinction worth making is between trolls and other "non-practicing entities" ("NPEs"). Non-practicing entities include any entity that does not practice its patents, making the concept broad enough to encompass universities, individual inventors and research companies. Like trolls, such entities do not create products and instead earn revenues from licensing or enforcement of intellectual property. The distinction is that non-troll NPEs often conduct research (followed quickly by licencing, rather than development) and typically do not engage in strategic aggregation and assertion of patents. The classic patent trolls that are the subject of this article conduct no research, have no products and are focused on the aggressive acquisition and enforcement of patents for technology that they did not develop.

(b) The Emergence of Patent Trolls

Patent trolling is not necessarily a new phenomenon. In 1878, Senator Issac Christiancy seemed to have patent trolling in mind, observing an initial inventor that leaves his patent "dormant" and a later patentee genius that "renders it of great practical value", at which point:

"...the patent-sharks among the legal profession, always on the watch for such cases, go to the first patentee and, for a song, procure an assignment of his useless patent, and at once proceed to levy black-mail upon the inventor of the valuable patent."

Although the idea of patent trolling is not new, the growth of the secondary patent market and the accompanying proliferation of patent troll litigation have been dramatic. A booming

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20 For example, Intellectual Ventures is by some assessments an innovation incubator and is by other assessments the ultimate patent troll. This American Life, supra note 15.

21 See the discussion at Patent Freedom https://www.patentfreedom.com/about-npes/background/, although Patent Freedom treats the terms "NPE" and "troll" as seemingly equivalent.

secondary patent market has emerged that assists in identifying, negotiating and transferring patents from one firm to another.\(^{23}\) Between 2006 and 2008, both producing entities and trolls increased their purchase of high-tech patents by 20% - 30%.\(^{24}\) In 2009, global patent sales were estimated to generate $1.2 billion per year, a number that has no doubt risen since.\(^{25}\) Although patent transactions slowed (along with most others) during the financial crisis, the secondary patent market recovered its vigour in 2010.\(^{26}\) Patents are valued based on the financial opportunity they present for licensing or enforcement, or the defensive position they offer producing firms. Not all participants in the secondary market are trolls, but the market boom has certainly been accompanied by a proliferation of lawsuits by patent trolls.\(^{27}\) By some estimates, there has been a five-fold increase in lawsuits initiated by patent trolls between 2004 and 2011.\(^{28}\) The number of operating companies involved in patent lawsuits with non-producing entities has increased by an average of 33% per year since 2004.\(^{29}\) Some of the reasons for this surge in litigation are discussed below, including the evolution of multiple-patent products and systemic problems in patent issuance and quality.

(i) The Rise of Multiple-Patent Products

At its inception, the patent system contemplated a single device or machine covered by one patent. Over time, an increasing number of products have emerged that are covered by many, many patents, particularly in the information and telecommunication industries.\(^{30}\) Today the patent/product relationship is a continuum, one end consisting of a single product with a single


\(^{25}\) Ibid. at 116.

\(^{26}\) Ibid. at 117.

\(^{27}\) Other players in the secondary market include patent agents/brokers (such as iPotential and ThinkFire) that help patent sellers find patent buyers or licensees by directly marketing to potential buyers or licensees, and patent-assertion managers like General Patent Corporation International, which provide technical and financial support services to patent assertion entities to help them evaluate the viability of their patent cases. See Millien & Laurie, supra note 16.

\(^{28}\) Patent Freedom estimates that in 2004, there were 223 lawsuits involving non-producing entities and in 2011, there were 1,143 (although at least part of the increase in 2011 results from prohibitions on joinder introduced by the America Invents Act). See Appendix A.


patent (such as a simple pharmaceutical drug) and the other end consisting of a high-technology device covered by a multitude of patents. The classic example of the latter is a smartphone, which by some estimates is covered by more than 250,000 patent claims, with almost 8,000 patents and patent applications declared essential to the 3G standard alone. The technological complexity and rapid evolution in high-tech industries means each product contains many different components that are subject to or "read on" many different patents. It has led to concepts like products covered by "patent thickets" - densely overlapping patent rights held by multiple patent owners. The proliferation of "multi-component, multi-patent products" means the exposure of each product to potential patent litigation has also grown. As discussed in the section below titled "The Hold-up Problem", the risk of patent litigation can lead to innovator hesitancy to develop a product or to the extraction of inappropriately high royalties post-introduction of a new product.

(ii) Systemic Problems in Patent Issuance and Quality

A major factor contributing to the widening gap where patent trolls feed and breed is the system of patent issuance. Patent issuing authorities have the difficult task of assessing ex-ante the true merits of a patent filing. Generally, the parties and the market find out only after a judicial challenge whether the patented technology is truly innovative and whether patent authorities have made the right assessment. In 2000, 47% of patents challenged in the U.S. Court of Appeals for the Federal Circuit were invalidated. Compounding the problem are the lengthy delays between the application and issuance of patents by patent agencies. In the U.S., patent examination takes an average of almost three years from filing until the patent is issued or is abandoned. In the technology sector, with its notoriously short product life cycles, the patent system of ex-ante adjudication and the pendency problem create a fertile environment for trolls.

Patent applications can be amended after publication through continuation and division which add uncertainty for producing entities, to the benefit of trolls. The claims in a patent application

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31 Harris, Patent Thickets, supra note 12 at 1.
33 FTC Report 2011, supra note 5 at 56.
that are rejected in the initial submission can, through a patent continuation application, be broadened or rewritten and claims can be added. When a patent is rejected or granted in part for lack of unity, a divisional application can be made to patent spin-off inventions or subsequent inventions. Generally, the continuation or division applications, if granted, will relate back to the date of the original application and retain priority over later filings. This adds uncertainty to the potential for infringement claims and makes it easier for parties to modify the patent so that technology will read on it - to the detriment of their competitors or the targets of their trolling activity.

Poor quality, ill-defined patents add to the patent troll problem. Vague patents make it easier to argue that the patent covers the technology created by (or at least developed by) the defendant in the litigation. Some argue that patent applicants make their patent claims purposefully vague in hopes that the claims will be interpreted in their favour in later litigation. The lack of clarity around patent rights is particularly evident in the information technology and telecommunications industries, in contrast to chemical, pharmaceutical and biotech industries, where "you can look at a patent and know where you stand" with much less investigative cost and effort. For example, software patents have been singled out as suffering from more notice problems than other types of patents and have been criticized for their unpredictable boundaries. In the U.S., decisions of the Federal Court in the 1990s removed restrictions on abstract claims in software patents, resulting in a proliferation of both software patents and related lawsuits. Since those decisions, software patents have become a particular favourite of patent trolls.

(iii) The Spreading Troll Phenomenon

Although patent trolls have been a problem mainly in the U.S., the issues they create are not confined to the U.S. In the European Union, for example, IPCom bought a portfolio of Bosch

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38 Ibid. Unity of invention is a prerequisite for patenting, meaning a patent may relate to only one invention or a group of closely related inventions.

39 FTC Report 2011, supra note 5 at 85, referring to testimony from panelists who contributed to the report.

40 Ibid. at 82, referring to testimony from panelists who contributed to the report.


42 Ibid. at 213.

43 One study found that of the most-litigated patents (including those litigated by trolls), software patents accounted for almost 94% of the lawsuits. John. R. Allison, Mark. A. Lemley & Joshua Walker, Patent Quality and Settlement Among Repeat Patent Litigants (2010), 99 Georgetown Law Journal 677 at 695 [Allison, Lemley & Walker].
patents on mobile devices and is now suing Nokia and HTC for patent infringement. However, to date the European Union has faced less of a patent troll problem, in part due to the design of its patent and litigation system. The European Union has not traditionally recognized business method patents, which are permitted in the U.S. and are common fodder for trolls. Similarly, software patents are less available in the European Union than in the U.S.

While Canada has not to date become "home" to many patent trolls as the venue of choice for this type of litigation, it would be wrong for Canadians to ignore the problem. Canadian technology companies have been the targets of patent troll litigation, most famously RIM in its legal battles with NTP. Even when there are no infringement claims in Canada or Canadian companies targeted, the hold-up of a company in the U.S. by patent trolls imposes disproportionate rents that are exported along with the products to consumers worldwide, including those in Canada. Although this paper discusses the U.S. experience, the export of patent licensing costs make patent trolls every country's problem.

Regardless of where and why patent trolls have become an issue, it is clear that they are popping out from under patent bridges in unprecedented numbers. Broad economic and industry trends suggest that the patent troll problem will continue, if not worsen, unless reforms are implemented. There has been a significant and permanent shift on company balance sheets from tangible to intangible assets, a large component of which is intellectual property. Intangible assets, such as intellectual property, are now a major source of companies' value, rather than traditional capital assets like real property, plant and equipment. As the value of patents to

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45 The Convention on the Grant of European Patents (European Patent Convention) of October 5, 1973, 1065 U.N.T.S. 255, Art. 52(2). As well, the European Union has a "loser pays" rule in patent litigation rather than the American approach in which each party generally bears its own costs of litigation, see Anna Mayergotz, Lessons from Europe on How to Tame U.S. Patent Trolls (2009), 42 Cornell Int'l L.J. 241 at 266 [Mayergotz]. Recent changes introduced by the Leahy-Smith America Invents Act bring the U.S. patent system into closer alignment with that of the European Union.


47 Other Canadian companies, such as MOSAID, have become involved in the mass buy-up and subsequent litigation of patents.

48 For example, it is estimated that mobile device manufacturers using the Google open-source Android platform may bear over $60 per device in non-Android patent fees. Although not all of these fees are necessarily the result of patent trolls, they illustrate the significant royalty burden that consumers may wind up paying. IP Wire, "The real cost of Android? Potentially $60+ per device in patent fees", (July 13, 2011), online: IP Wire <http://www.ipwire.com/ip-deals-and-opinion/the-real-cost-of-android-potentially-60-per-device-in-patent-fees.html> [IP Wire].

49 Nearly 80% of the value of U.S. publicly traded companies now comes from intangible assets, the largest component of which is intellectual property, according to research conducted by Ned Davis Research for Ocean Tomo LLC. Millien & Laurie, supra note 16.
businesses rises, the potential for leverage by trolls does as well. This change has been accompanied by an ongoing global shift toward stronger intellectual property rights, in both developed and developing nations that makes the reconciliation of patent rights and competition law essential in both a domestic and international law context.\textsuperscript{50} Innovation in mobile computing and communications are constantly increasing the complexity of high-tech devices. Greater technology integration and improved functionality mean that each device will read on a growing number of patents, compounding issues such as "royalty stacking" (discussed below) on which trolls rely. Although patent trolls are addressed in this article in the context of high-tech industries, by some estimates patent trolls are broadening their horizons and targeting companies outside of the high-tech sector more often (see Appendix B). The problem is spreading.

\begin{enumerate}
\item[c] In Defence of Patent Trolls
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Most of the literature and commentary paints patent trolls in a negative light, but some argue in their favour. Three common arguments raised in defense of the trolls are that (i) trolls are useful market intermediaries, (ii) trolls act as champions for small inventors and (iii) similar win rates between troll litigation and other infringement litigation mean troll litigation has merit.

Some claim trolls identify undervalued patents, buy them up and market them to other firms, pioneering a useful market for undervalued assets.\textsuperscript{51} The brokerage roll of patent trolls in the secondary patent market, should, in theory, enable the transfer of technology to those with the capacity to commercialize it and ultimately promote innovation. But the theory assumes that the patent lands in the hands of someone who will use it constructively to innovate. This is not true in the case of trolls, who tend to focus on licensing and litigation of patents that have already been used in a commercial product.\textsuperscript{52} The patent is not transferred to any innovative end-user. It is merely asserted and litigated against a company that has already accessed the patented technology and integrated it into an innovative product. The market-maker arguments in favour of patent trolls are weak, especially when trolls are compared to companies who truly take a forward-looking approach to the acquisition of patented ideas before they are commercialized, with the intent of acquiring patents that have a resale value because of their development potential.\textsuperscript{53}

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\textsuperscript{53} Ewing & Feldman, supra note 15 at 23, on "patent aggregators".
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Along the same lines, trolls claim a role as the champion of the small inventor, making it possible for individual inventors to recover a reward from their patents. The idea is that trolls act as a "market mechanism for the forgotten inventor whose innovations are in use every day but who remains uncompensated".54 Where inventors lack the expertise and resources to license their technologies or enforce their patents, trolls or other secondary patent market participants provide a means to do so. The result of providing the proper reward to inventors for their patents should be greater incentives for innovation.

But once again this defence of trolls is weak. If trolls are merely enabling the recovery of rents by inventors, this should lead to inventors receiving a greater reward in exchange for their innovation and no net loss to society as a whole from the existence and activities of patent trolls. Empirical studies indicate, however, that little of the reward reaped by patent troll litigation is transferred to the inventors.55 If the patent troll settlements from the recent surge in litigation were being transferred to independent/small inventors, we might expect a corresponding increase in small inventor research activity to follow, but this does not seem to have occurred.56 The problem of the forgotten inventor is nothing new; inventors have always searched for capital or purchasers for their inventions. This begs the question of why trolls have suddenly appeared to carry out this role. It seems more likely that what is drawing trolls is the ability to extract supra-competitive rents, rather than the philanthropic prospect of aiding forgotten inventors.

Lastly, some argue that similar win rates between troll litigation and other patent litigation is evidence of the merits, or at least the neutral effect, of trolls.57 But shouldn't an entity that is a professional litigator, a repeat actor that seeks out and litigates patents on an ongoing basis as its business model, have a much higher litigation success rate than a producing business? A producing business that finds itself embroiled in patent litigation is, after all, both lacking in significant litigation experience and tied up by its day-to-day operations. Further, some studies indicate trolls are less successful than producing entities in litigation. One article found that of 1,134 litigation results considered, product owners bringing patent litigation won 50% of the time while non-producing entities won only 9% of the time.58 Since the business of patent trolls is litigation, their comparative lack of success in litigation supports the idea that patent troll litigation is a rent-seeking behaviour.

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54 *Ibid.* at 20, referring more broadly to "mass aggregators" which includes entities like universities that are not true patent trolls.

55 Bessen, Ford & Meurer, *supra* note 15 at 20 found 2% or less of the defendant losses in NPE litigation were transferred to independent inventors.


4. Exploiting the Gap: The Impact on Competition and Innovation

Arguments for the negative impact of trolls are more common and more persuasive. Bessen's empirical research suggests patent trolls destroyed over $500 billion in wealth between 1990-2010. Bessen's work considers only a sample of U.S. publicly traded firms and so does not account for losses on a worldwide scale or losses to private firms. The direct costs of patent litigation fees alone are by some estimates a median of $4.5 million per suit, and certainly much higher figures are possible. Add in consideration of the median damage award for patent litigation, estimated at $4.2 million in 2007, and it becomes clear why firms may rush to settle even questionable infringement claims. It is less expensive, often significantly so, to pay a troll who has acquired a few low quality, potentially infringing patents to simply go away. It is no wonder patent trolls are cast as "blackmailers" who put a "crippling tax on productive enterprises".

These figures do not value the indirect costs borne by defendants when time and resources are consumed by the litigation and diverted from productive activities that might otherwise have positively impacted innovation and competition. Nor do the numbers account for a broader economic issue beyond competition and patent law: once costs are incurred and litigation is settled (or damages awarded), costs become "locked-in" for the firm and are typically likely to be passed on to consumers through raised prices and decreased quality.

Of course all patent litigation, not only suits brought by patent trolls, imposes business costs. Yet critics claim patent trolls impose costs that are unmerited by acquiring patents that are fuzzy or uncertainly worded, solely for the purpose of opportunistically litigating against the true innovators. Studies indicate that patent troll litigation has distinctive characteristics which suggest it may be more detrimental to innovation than "traditional" patent litigation: it targets

59 Bessen, Ford & Meurer, supra note 15 at 17. Bessen measured the market capitalization loss of defendants in patent troll litigation, with adjustments to take into account market trends and other random factors affecting an individual share price.


61 Ibid.

62 Magliocca, supra note 22 at 3 referring to other critics.

63 As Mallun Yen of Cisco Systems, Inc. put it, "every assertion we receive distracts our engineers from innovation and productive efforts" that could "otherwise be spent on developing new products". Comment, FTC Hearing on the Evolving IP Marketplace (December 5, 2008) as quoted in the FTC Report 2011, supra note 5.

64 Bessen, Ford & Meurer, supra note 15.
firms that have already developed the litigated technology, it often involves high-tech patents and it frequently targets several large defendants that are innovation leaders.  

Normal course litigation by producing entities often involves an ex-ante negotiation of patent rights, followed by litigation early in the life of the patent, if necessary. In contrast, patent troll litigation tends to be at the end of the patent life, providing more time for the trolls' patented technology to be integrated into products – and more corresponding opportunities for ex-post negotiation and litigation. The difference in timing between patent litigation brought by producing entities and litigation brought by trolls is dramatic; in one study, trolls represented only 20% of all patents enforced, but were involved in over 80% of the patent claims brought in the final three years of the patent term. In the high-tech sector where product life cycles are incredibly short it seems peculiar that patent troll litigation is more prevalent at the end of patent terms. This suggests patent trolls are not, as claimed, creating useful innovation markets, as there is no reason to wait to bring a technology patent to market. Instead of promoting patent licensing as a tool for innovation, it appears trolls are lying in wait for litigation prey. A patent troll's litigation leverage is much stronger once a manufacturer has selected a technology, designed and introduced a product in the market and built up a customer base so it may make sense to lie in wait before launching litigation.

Troll litigation is "focused on software and related technologies", as illustrated by the list of the top 10 companies most targeted by patent trolls, all of which are high-tech businesses (see Appendix C). Trolls benefit from vague or ill-defined patents for which infringement claims are easier to assert, the common example being software patents. Products covered by multiple patents, which most high-tech products are, present greater opportunities for hold-up (as discussed below). Although targeting software and high-tech patents is not in itself necessarily harmful, it does highlight the distinct flavour of troll litigation and suggests such litigation relies on features of the patents and products involved that are distinct from traditional litigation.

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65 Ibid. at 2.

66 Love, supra note 52 concluding non-practicing entities are far more likely to enforce old patents than practicing entities; Michael Risch, Patent Troll Myths (2012), 42 Seton Hall Law Review at 32 found the mean troll lawsuit occurred eight years from the issuance of the patent. He attributes this delay to the initial inventor/assignee, however, not to the patent troll (although admittedly the assignment record may be incomplete). Bessen, Ford & Meurer, supra note 15 at 7. See also discussion of ex-ante and ex-post patent transactions in Chapters 1 and 2 of the FTC Report 2011, supra note 5.

67 Love, supra note 52 at 3. These results exclude universities and individual inventors from the litigation considered to be brought by non-producing entities.

68 Ibid. at 35.

69 Bessen, Ford & Meurer, supra note 15 at 25.

70 As mentioned above, one study found that of the most-litigated patents (including those litigated by trolls), software patents accounted for almost 94% of the lawsuits. Allison, Lemley & Walker, supra note 43 at 695.
Troll litigation also tends to tie up particularly innovative companies. Consider the list of the top 10 firms facing litigation by non-producing entities (Appendix C) or the recent Digitude claim mentioned above, both of which read like a who’s who of leading innovators: Apple, Microsoft, Google, Sony and others. To be fair, such companies produce new, complex products that one might expect to be litigation magnets. Still, troll litigation is not only diverting the resources of companies; it is diverting society's most valuable resources, those of firms that are research and development leaders.71

The Digitude example also illustrates the tendency of trolls to name a lengthy list of defendants in litigation. By naming many defendants, trolls exacerbate the negative impact on innovation arising from the litigation. This trend has been the target of recent reforms in U.S. patent law.72 The *Leahy-Smith America Invents Act*, discussed further below, has restricted patent trolls' ability to join multiple defendants in order to reduce patent troll suits.73

These distinctions between troll litigation and producing entity litigation suggest that (i) trolls are focused on suspect litigation, aimed at extracting opportunistic royalties and settlements from their patents and (ii) troll litigation, in contrast to more traditional patent litigation, has a disproportionate potential to deter innovation.

The roots of the patent troll issue and the impact on innovation are discussed below, including the asymmetry of litigation risk, the hold-up problem and the value shift to exclusionary rights of patents.

(a) Asymmetry of Litigation Risk

As patent litigation has evolved, many producing entities, particularly those in high-tech industries, have adopted a strategy of amassing large patent portfolios. This is typically to protect themselves from offensive attack. It also ensures the entity can assert its portfolio to defensively shelter competitive advantages created through research and development.74 By accumulating a stockpile of patents, producing companies gain the freedom to operate within the scope of those patents and hope to neutralize potential patent lawsuits from other operating entities.75

In the shadow of potential litigation and injunctions, their large stockpiles of patents enable companies to reach cross-licensing agreements in which the firms trade rights to their respective patents. This strategy between producing entities is reminiscent of the Cold War, where the

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72 As Bessen, Ford & Meurer, *supra* note 15 at 15 explain, where a patent may be interpreted broadly against multiple large defendants it makes the threat of a lawsuit more credible, because the payoff if the lawsuit is successful may be large, even if the probability of winning is low.
73 See further discussion of the *Leahy-Smith America Invents Act* reforms in "Legislative Responses", below.
74 Chien, *supra* note 22 at 304-310 traces this development.
75 *Ibid.* at 308.
accumulation of a credible arsenal of weapons by opposing parties lessened the chances of attack. Parties stick to "patent peace" where they either agree to cross-license or ignore each other. Although all parties realize that, if fired, not all weapons will explode – in that not all patents will survive judicial challenge – the threat of mutually assured damage from successful claims is such that uneasy peace may be the chosen strategy. For these firms litigation becomes a last resort, rather than the first resort it is for trolls. To the extent that opportunistic litigation is avoided, economic welfare is enhanced as firms focus instead on innovation.

Given their patent stockpiles, producing entities embroiled in patent litigation tend to face symmetrical risk, in the form of the significant potential business cost of an injunction that blocks the sale of the infringing product. The problem today is that the emergence of patent trolls has shifted the paradigm of patent litigation, making it a "one-sided game". Unlike traditional companies, patent trolls have no underlying business at stake. The litigation does not divert resources from their ongoing business; licensing and litigation is the business. This creates an asymmetry of litigation risk because unlike traditional firms, patent trolls do not commercialize technology and need not be concerned that counter-claims will threaten their operations or product revenue.

Similarly, there is nothing holding a troll back from pursuing a reputation for vicious litigiousness, a reputation that a producing entity might want to avoid. Trolls have no need to worry that, through litigation, they could alienate a potential future supplier, buyer or joint venture partner in their industry. On the contrary, a troll benefits greatly from the reputation of being a fierce litigator. Such a reputation makes the mere threat of litigation sufficient for targeted licensees to fold and pay licensing fees. By signalling to the market that it will not hesitate to pursue litigation, a troll minimizes the need to actually bring suits and maximizes the value it can extract from its patent portfolio.

The critical importance of litigation risk asymmetry is illustrated by producing entities that have begun to pursue a troll-like asymmetry through the transfer of patent portfolios to other parties. The benefits of such patent transfers are both financial and strategic. In 2011, Microsoft, Nokia and MOSAID entered into an agreement wherein MOSAID acquired and licensed back approximately 2,000 Nokia patents, many related to standard technology for wireless compliant handsets. In exchange for the transfer, MOSAID will pursue licensing (and litigation) with third

76 Ibid. at 317.
77 Despite this common logic, there is still a significant amount of litigation between producing entities. One can only imagine increased litigation activity if the parties lacked their respective patent arsenals.
78 Chien, supra note 22 at 310; Love supra note 52 at 39.
79 Ibid.
80 Jason Williams, Mark V. Campagna & Olivia E. Marbut, Strategies For Combating Patent Trolls (Spring 2010), 17 J. Intell. Prop. L. 367 at 368 [Williams et al.], explaining the lopsided risk in patent troll litigation and litigation strategies to counteract patent trolls; Mayergotz, supra note 45 at 242.
81 Williams et al. Ibid. at 368.
parties, paying two-thirds of the collected royalties to Microsoft and Nokia. Since MOSAID is a non-practicing entity, the effect of this transfer arrangement is to eliminate the threat of counterclaims that would exist if Nokia or Microsoft pursued licensing arrangements themselves. MOSAID has since launched a suit against Apple in the U.S. alleging infringement of eight of the acquired wireless patents, which are used in iPads and iPhones. The added benefit of this strategy is that the similar technology used by competitors in an industry means the entity enforcing the portfolio will most likely be pursuing licensing and litigation against the transferor's competitors.

Another recent example is the aggressive campaign by Microsoft, Apple and other mobile device firms against the competing Google Android open-source software ecosystem. Over the past few years, Android has grown rapidly in popularity as an operating system on mobile devices in the U.S., threatening incumbents. However, Google has a much smaller patent portfolio than its competitors, and Microsoft and Apple have responded to this asymmetry by collaborating to acquire patent portfolios with perceived strategic value against mobile devices and open source operating systems like Android. Since 2010, Apple and Microsoft have collectively filed more than 20 different actions, including both U.S. district court civil actions and U.S. International Trade Commission ("ITC") proceedings, strategically targeting a number of Android-based OEMs with claims that Android devices infringe their respective patents. Barnes & Noble is claiming that Microsoft has, among other actions in connection with its licensing programs, asserted that Microsoft patents cover every implementation of Android and then threatened to sue OEMs that sell any Android device – regardless of whether those devices in fact infringe any Microsoft patents – unless they take a license from Microsoft. Such conduct seems to indicate that the techniques of trolls are now leeching into the producing entity space.


83 The suit was filed in the U.S. District Court for the Eastern District of Texas by Core Wireless Licensing, the entity owned by MOSAID which holds the acquired Nokia patents. Loek Essers, "Mosaid Subsidiary Sues Apple Over Wireless Patents", PC World, March 6, 2012, online: PC World <http://www.pcworld.com/businesscenter/article/251396/mosaid_subsidiary_sues_apple_over_wireless_patents.html>.

84 IP Wire, supra note 48 (explaining that Android has an "Achilles Heel" in the form of Google's "thin wireless intellectual property portfolio").


The Hold-up Problem

The proliferation of multi-component, multi-patent products in a system where patents are presumed valid until determined otherwise by a court has compounded the patent troll problem by enabling patent "hold-up". Once a firm has integrated a patented technology into its product, knowingly or not, the simple threat that a patent holder may obtain an injunction barring sales of the product enables a patent troll to extract royalties greater than the economic value contributed to the patented invention. The firm is forced to pay to avoid potential infringement liability or the costs of switching to a non-infringing technology. Exploitation of the economic "hold-up" opportunity is at the core of the patent troll litigation strategy.

The mere threat of an injunction being issued against a product that contains an infringing component is significant and powerful, simply because the injunction could completely prevent the sale of the product or use of a key feature. The classic example is NTP's infringement litigation against RIM, which had the potential to render the popular BlackBerry device essentially useless by preventing RIM from using its wireless e-mail system in the U.S. The litigation concluded when BlackBerry settled with NTP for $612.5 million. In a recent case involving producing entities rather than trolls, Apple sought and, in some cases, obtained injunctions to block the sale of Samsung's Galaxy devices in the U.S., Australia, and several European counties. This prompted a myriad of counter-suits by Samsung claiming that Apple infringed on its patents and failed to pay royalties.

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87 Su, supra note 4 at 5, 26.
88 Lemley & Shapiro, supra note 30.
90 Generally, Apple is asserting that TouchWiz and the Galaxy S infringe upon its iOS home screen and iPhone 3G design patents (among others). Apple was initially denied an injunction in the U.S., however a preliminary ruling in Germany blocked sales and advertising of the product across Europe, with the exception of the Netherlands. German courts have since permitted the sale of a redesigned product. For a summary of the litigation see Chloe Albanesius, "German Court Rejects Apple Bid to Ban Samsung Galaxy Tab 10.1N", PC Mag (February 9, 2012), online: PC Mag <http://www.pcmag.com/article2/0,2817,2400037,00.asp>. Similarly, the Australian Federal Court granted Apple injunctions that delayed the launch of the Galaxy Tab 10.1 in Australian stores from October until early December, 2011 at which point the Federal Court reversed its decision. Apple added even more
The threat of an injunction blocking product sales seems disproportionate when the patent covers one small part of a complex and profitable product, the design, marketing and manufacturing of which have been invested in heavily by the defendant.\(^92\) Patent infringement on one small and relatively unimportant component could drive the removal of the entire (predominantly non-infringing) product from the market. Information technology products tend to have a high number of patents that cover or "read" on a single product. The more patents in the "patent thicket" on a given product, the less the contribution of any patent to the overall market value of the product.\(^93\) Yet this is not typically taken into account when injunctions are granted.\(^94\)

For high-tech products, which tend to have short lifecycles, an injunction that blocks sales for even a limited period can prove fatal. Manufacturers are compelled to sell as much as they can of a new technology product as soon as possible, before it is rendered obsolete by the next development. Lengthy litigation could outlast the useful commercial life of the product at issue and this litigation risk creates a strong incentive for the product manufacturer to settle patent infringement claims. The possibility of an injunction hangs heavy over royalty or litigation negotiations, with limited regard to the apparent validity of the patent. As a result, the patent holder can use the injunction threat to extract much higher royalty rates than are merited by the contribution of the infringed component to the overall product.\(^95\)

The hold-up problem is further exacerbated in multi-patent products subject to "royalty stacking", where a single product could potentially infringe many patents and, as a result, bears multiple royalty burdens. The various claims for royalties must be added together to determine the overall royalty burden for a given product to be sold without ensuing patent litigation.\(^96\)
owner of each patent input will demand a royalty from the manufacturer of the end product, without regard to the effect the total royalty burden for the product will have on the manufacturer and the overall product price. Each patent holder has an incentive to hold-up the seller for a disproportionate share of the economic value of the patented component to maximize their own royalties. Royalty stacking can be so burdensome that it may make it unprofitable for the firm bearing the royalty burden to bring a product to market. The more patent owners whose royalties are "stacked", the more the potential for hold-up grows.

Integrated devices—those where the function of a product is tied to its ability to interoperate with other devices—are even more vulnerable to hold-up tactics. Products such as mobile phones derive their value from their ability to interoperate with other phones that are designed and built to a common standard. The necessity of standards compliance makes the hold-up potential extremely high where a patent holder could potentially block the use of a patent that is essential to the standard. Most new devices are "backwards compatible" meaning that in addition to including the most current standard, they maintain compatibility with older standards. The result is that with each new generation of technology the number of standards involved in each product and the number of patents incorporated in each standard both grow. This increases the potential that one or a few of the essential patent holders could extract disproportionate royalties from the others. The economics of this scenario have led standard setting organizations to require participants to commit to license standards essential patents on fair, reasonable and non-discriminatory ("FRAND") terms.

The potential for over-compensation of patent holders through damage awards compounds the hold-up problem and creates incentives for patent trolling. The more patents that read on a product, the smaller the contribution of each patent to the overall market value of the end product, yet damage awards are not generally adjusted to reflect this. Instead, courts tend to award damages in patent infringement suits based on an "entire market value rule", which enables recovery of damages based on the entire product, instead of solely the value of the infringing component, as long as the value of the product is legally attributable to the patented

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98 See the in-depth explanation of royalty stacking in Lemley & Shapiro, supra note 30 at 2010.

99 Ibid. at 2016. Where a product is brought to market burdened by the inflated royalty stack, it also creates an artificially high price floor in reference to which inferior, less innovative products can be priced.

100 Some authors argue royalty stacking is not a concern in practice, see Sidak, supra note 97 at 714.

101 Dr. Robert G. Harris, Standards-Essential Patents & FRAND in Mobile Communications (draft) at 3-4.

102 See below, 5(a)(ii) Standard-Setting Organizations, for a further discussion of standard-setting organizations.


104 Harris, Patent Thickets, supra note 12 at 6; Lemley & Shapiro, supra note 30 at 2034.
invention. At the inception of the patent system, when one patent tended to read on one product, the entire market value rule made sense, but for a multi-patent product this approach to damages may well over-compensate patentees relative to their contribution to the overall device and encourage negative trolling behaviour.

The practical implication of hold-up, driven by the threat of injunctions or excessive damage awards, is that patent trolls can distort competition and deter innovation through their impact on decision making by producing firms.

In deciding whether to develop technology, a producing firm looks at the anticipated return on investment. With the emergence of trolls, the risk of inadvertently infringing on a patent and facing subsequent disproportionate royalties or litigation has increased, and this potential cost must be taken into account in determining whether to proceed with an investment. The cost of troll litigation can thus skew decision making by lowering the apparent return on investment and reducing the likelihood of investment in research, development and commercialization of innovative products.

Once a firm has proceeded with the development and commercialization of new technology, it is in a poor negotiating position if a patent troll appears to collect ex-post licensing fees. As the FTC Report explains, such ex-post licensing of technology, although an important means for the assertion of patent rights, is more likely to distort competition and deter innovation. Rather than rewarding firms that bring new products and service to market, as the patent system should in order to promote innovation, ex-post licencing may impose risks and costs on those firms.

Beyond the immediate effect on the firm targeted by licensing efforts or litigation, trolling activity also has broader impacts on third parties. First, such litigation signals to the market that patent trolls are aggressive rent seekers, which may chill innovation amongst other companies, as they change their behaviour to avoid becoming a troll target. Second, it has the potential to scare other producers into executing royalty agreements for questionable patent assertions as a cost and risk-minimization technique. The associated costs are built into the device and passed on to consumers, resulting in a "lock in" effect. Finally, the disproportionate settlements extracted by trolls in effect become a floor for later arguments about reasonable royalties. Trolls can point to the hold-up-influenced settlement – which may not reflect anything close to the true value of the patent – as a seemingly reasonable precedent on which to base the calculation of reasonable royalties.

105 Love 2008, supra note 103 at 264.
106 Ibid. at 274.
107 FTC Report 2011, supra note 5 at 53.
108 Daniel P. McCurdy, Patent Trolls Erode the Foundation of the U.S. Patent System, Sci. Progress, Fall & Winter 2008/2009 at 82; Harris, Patent Thickets, supra note 12 at 7 argues the situation is even more dire, because a "negative feedback loop" is created. Patent abuse leads to rewards in excess of the value of the patented technology, increasing the value of the patent assets to patent "abusers" like trolls. This prompts excessive patenting that in turn detracts from the creation of true value-generating innovation.
Co-patentees also suffer when rewards greater than the economic contribution of the patentee are paid on patent-heavy products. In the ecosystems of patents that cover today's high-tech products there is an interdependence between patent holders. No single entity has the capacity to conduct all of the research to develop all of the patented technologies in increasingly complex high-technology products.\(^{109}\) Each individual patent has little or no value alone, but becomes valuable when used in conjunction in the complex product. This interdependence means an attack on one patent used in the overall product is effectively an attack on all of the "co-patentees" who have components in the same device targeted by the litigation. Yet injunction and royalty decisions do not account for the interests of the co-patentees. The parties that contributed to the economic value of the product do not receive a share of the reward from litigation, they only bear the downside risk of losing licensing royalties if the product is enjoined from being sold. These externalities imposed by trolls on other patent holders reduce incentives for innovation in an ecosystem of interdependent patents.

\hspace{1cm}(c) \hspace{1cm} \textbf{The Exclusionary Value and the Technology Value of Patents}

In most countries, when patent systems were introduced, it was envisioned that the reward to inventors for their risk taking "would flow principally from the exploitation of their inventions and the introduction of new and improved products and services to the marketplace."\(^{110}\) In other words, the inventor would also be an innovator in the market. This illustrates the distinction between the first step of a patented invention, and the further steps needed to commercialize the invention into a useful innovation for society—steps that an inventor is not necessarily able to take.\(^{111}\) The gap between invention and innovation led to the development of the secondary market where patents can be purchased and, in theory, the invention turned into a socially valuable innovation.

The institutional problem is that the initial grant of a patent rewards only invention, and the assumed nexus between invention and innovation does not necessarily exist in the secondary patent market. Patent trolls value the right to exclude that is conferred by a patent, because it enables the patent troll to extract licensing revenues and offers the prospect of supra-competitive returns as a result of the patent-enabled monopoly. In contrast, the value of the patent to researching and producing entities lies primarily in the patent's underlying technology. As Henry C. Su explains, for patent trolls the value of the right to exclude, which arises from the patent's hold-up potential, has taken precedence over the economic value of the underlying invention.\(^{112}\) The market created by patent trolls shifts the focus from the economic value of developing the

\(^{109}\) Harris, Patent Thickets, \textit{ibid}. at 2.

\(^{110}\) Su, \textit{supra} note 4 at 12; U.S. Const. art 1, §8, cl.8.

\(^{111}\) Su \textit{ibid}. at 2; FTC Report 2011, \textit{supra} note 5 at 227.

\(^{112}\) Su, \textit{ibid}. at 12.
When the purchaser of a patent in the secondary market is interested only in the right to exclude, not the economic value of the underlying invention, competition law and patent law no longer share the common goal of promoting innovation. The "[w]idespread perception that where there is a patent there must be innovation" is no longer true. Patent law merely promotes invention with no corresponding innovation outcome and abusive conduct emerges, working against competition law objectives.

Where the patent system is not being used to promote innovation, there is a stronger argument for enhanced antitrust scrutiny. It is important that patent laws not be used to shelter conduct from antitrust scrutiny particularly where, as with trolling activities, the invention and innovation nexus has disappeared. To the extent that remedies premised on the exclusionary rights provided by patent law regimes fail to account for the disappearing nexus underpinning patent law's social bargain, competition law and enforcement institutions need to step in.

5. Addressing the Gap

Trolls operate in the space between two legal regimes, where they can leverage patent law and yet escape from antitrust scrutiny. As discussed above, the exploitation of this gap has high economic costs and serious implication for innovation. This section surveys the main efforts to address the gap between the patent and competition systems, looking at responses of the market, the judiciary, legislators and regulatory agencies. Much of the change is very recent making it too early to assess the effects, but what is clear is the absence of any single "magic bullet" solution.

(a) Market Responses

Defensive patent aggregation, standard-setting organizations and patent pooling can all have the effect of reducing the cost or likelihood of patent hold-up. By doing so, these mechanisms can help fend off trolls or other entities that seek to leverage the hold-up value of a patent. The challenge is to ensure that these market responses are not, in themselves, anti-competitive.
(i) Defensive Patent Aggregation

In the face of rising patent troll litigation, technology companies have developed their own offensive strategies to keep patents from the clutches of patent trolls. Market participants have begun to buy up patents, either directly or through "defensive patent aggregators", who purchase and protect patents on another party's behalf. As discussed above, acquiring a patent stockpile prevents the patents from falling into the hands of trolls and also makes the patents available for cross-licensing to settle or deter infringement claims.

Defensive patent aggregators can also play a role in rebalancing the litigation risk asymmetry between producing entities. The aggregator is akin to a litigation defence fund. Whereas a company would normally have the limited resources of its own patent portfolio from which to draw on when launching a counterclaim to an infringement suit, a patent aggregator can provide a broader source of potential patents for a counterclaim to deter litigation. The patent rights can be acquired, a countersuit launched, and the patent "returned" to the patent aggregator when the litigation concludes. The patent aggregator lends just the right weapon, or at least creates the counter-threat of doing so, in order to fend off the attack.

However, there are emerging opinions that the cure of mass aggregation is as bad as the disease, taxing current production similarly to patent trolls and providing opportunities for anti-competitive behaviour. In theory (and in most practice), patent aggregators are still distinguishable from trolls because they use their patent stockpiles only as a defensive shield to litigation and not as a sword to reap potentially unmerited rewards.

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115 For example, the companies RPX or Allied Security Trust. On behalf of clients, RPX identifies and purchases patents that could be used against its clients. RPX claims not to offensively apply the patents that it aggregates for clients. See the RPX website at <http://www.rpxcorp.com/>. Allied Security Trust ("AST") identifies and purchases high-tech patents that are of interest to its members. Its mission is to minimize "business disruption" from patent trolls targeting its members. Companies pay a fee to join AST, and members then fund the acquisition of patents they are interested in and are granted licenses by AST for the funded patents that are acquired (or members can obtain licenses for other patents held by AST). See the Allied Security Trust website at <http://www.alliedsecuritytrust.com/Services/LicensingModel.aspx>.

116 Ewing & Feldman, supra note 15 at 22 explain that although producing companies still incur costs to respond to the troll problem, using mass aggregators to buy patents may be cheaper than buying off trolls and it is less of a distraction and aggravation for company executives than troll litigation.

117 Ibid. at 21. The authors also give several examples of producing entities using this defensive strategy against each other.

118 Ibid. at 23 onward.
Standard-setting organizations can also be a valuable pro-competitive mechanism to reduce patent hold-up potential. Through a standard-setting process, firms that are members of an industry standard setting organization reach a consensus on the standard technology to be adopted. In many cases, the standard-setting organization then imposes an obligation on members to license the patents included in the standard technology on FRAND terms. Requiring standard licensing of essential technology reduces the possibility of hold-up in licensing negotiations for that technology, because it takes the possibility of an injunction off the table and leaves only the question of the exact licensing terms. The standardization of technology enables the efficient use of the technology by firms and the diffusion to consumers, while the licensing requirements help avoid unnecessary litigation.

However, standard-setting organizations come with their own potential antitrust risks. These include the potential for anti-competitive collaboration arising from the joint activity by competitors, as well as risk in the form of patent "ambush". Once a standard is implemented, there will be widespread investment in and adoption of that technology in the industry, while alternative technologies fall by the wayside. As authors Lemley and Shapiro explain, it can be extremely expensive, or even impossible, to design around a standard with alternative technology, even though a different standard technology could have been adopted initially. This gives an entity tremendous hold-up power if it keeps back a patent that reads on part of the standard, then ambushes industry participants by demanding royalties disproportionate to the value of the patent reading on the standard. Such an abuse of the standard-setting process can harm innovation and result in higher costs to consumers.

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119 There are other commonly cited benefits and reasons for standard setting activities that are not addressed here, such as permitting interconnectedness to the benefit of consumers (for example, a 3G telephone network).


121 Lemley & Shapiro, supra note 30 at 2016.

122 Michael A. Carrier, Innovation for the 21st Century: Harnessing the Power of Intellectual Property and Antitrust Law, (Oxford: Oxford University Press, 2009) at Chapter 14. See for example the Rambus investigation by the European Commission, Press Release "Commission accepts commitments from Rambus lowering memory chip royalty rates" (December 9, 2009). The U.S. FTC also filed a complaint against Rambus alleging the concealment of pending and issued patents in a deliberate manipulation of a standard setting process. After the standard was adopted, Rambus brought infringement suits against industry members that had incorporated the standard. In the Matter of Rambus Inc., FTC Dkt. No. 9302 (February 17, 2004 administrative law judge decision). On appeal, the FTC held that Rambus had unlawfully monopolized the computer memory technologies in question. In the Matter of Rambus Inc., FTC Dkt. No. 9302 (July 31, 2006) (order reversing and vacating the initial decision and order, scheduling supplemental briefing on issues of remedy and denying complainant counsel's motion for sanctions).
The issue is certainly a live one for antitrust authorities. The EC Guidelines on horizontal cooperation agreements, adopted last year, recognize that commitments to license standard essential patents on FRAND terms are necessary to enable patent access and competition.\footnote{123} In January 2012, the European Commission opened a formal investigation into whether Samsung had used some of its standard essential patent rights to distort competition in European mobile device markets, in breach of the company's FRAND licensing commitments and EU antitrust rules.\footnote{124} Standard essential patents were also a key issue in the recent acquisition of Motorola Mobility by Google, discussed in "Regulatory Agency Responses", below.

(iii) Patent Pools

Patent pooling can also mitigate the potential for hold-up. Patent pools are collective licensing arrangements where two or more owners of different patents agree to cross-license their patents to each other or a third party sublicenses the pooled patents to others.\footnote{125} Patent pooling can provide participants with the freedom to innovate based on patents in the pool at lower royalty rates than if the technology were licensed separately. Where a producing entity negotiates the rights it requires for a product with many rights holders sequentially, the final rights holder to reach an agreement is in a strong negotiating position and may hold-up the producing entity.\footnote{126} Licensing the patent pool rights in one fell swoop eliminates the strategic advantage of being the last rights seller to reach an agreement.

\footnote{123} "FRAND commitments can prevent IPR holders from making the implementation of a standard difficult by refusing to license or by requesting unfair or unreasonable fees (in other words excessive fees) after the industry has been locked-in to the standard or by charging discriminatory royalty fees." European Commission, Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, [2011] OJ, C 11/01 at 60; European Commission, Press Release, "Mergers: Commission approves acquisition of Motorola Mobility by Google" (February 13, 2012), online: Europa <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/12/129> [EC Google/Motorola Clearance Decision] noting "[t]he absence of such licences would hinder competitors or indeed the entire industry to the detriment of consumers and innovation."


\footnote{125} Scott Sher, Jonathan Lutinski, and Bradley Tennis, The Role of Antitrust in Evaluating the Competitive Impact of Patent Pooling Arrangements (forthcoming) at 18 [Sher].

However, as with standard-setting organizations, the pool by its nature involves a collaboration between competitors, raising its own competition concerns over potential price–fixing, joint abuse of dominance and tying. The U.S. IP Guidelines recognize patent pools and cross-licensing can be pro-competitive because they promote the dissemination of technology, but also that pools may raise competition concerns.\textsuperscript{127} The FTC considers a patent pool likely to be anti-competitive where the pool creates market power and potentially competing patents are part of the same pool. A distinction is drawn between pools composed of patents essential to the product or standard related to the pool, which have been permitted in the U.S., and pools that consist of competing patents, where but for the pool there would be competition between the respective firms on the basis of their patents.\textsuperscript{128} The latter type of pool has been prohibited because the establishment of the pool allegedly reduces competition.\textsuperscript{129}

(b) Judicial Responses

A recent U.S. case, \textit{eBay, Inc, v. MercExchange, L.L.C.}, shifted the law in favour of entities that practice their patents, illustrating the role of the judiciary in chipping away at the leverage of patent trolls.\textsuperscript{130} Unfortunately, U.S. courts have also narrowed the availability of another potentially useful tool – the patent misuse defence – in the recent case of \textit{Princo Corp. v. International Trade Commission}.\textsuperscript{131}

(i) \textit{eBay} Restricts the Availability of Injunctions

As discussed above, the threat of an injunction that prevents the sale of allegedly infringing products is a major source of trolls' hold-up power. \textit{eBay}, a 2006 U.S. Supreme Court decision, reversed two decades of law on infringement remedies by replacing the automatic issuance of a permanent injunction where patent infringement is found with a more flexible equitable test for the granting of an injunction.\textsuperscript{132} In \textit{eBay}, the concurring justices recognized that "an industry has

\begin{itemize}
  \item \textsuperscript{127} Supra note 2.
  \item \textsuperscript{128} DOJ and FTC, Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition (April, 2007) at 74, online: FTC <www.usdoj.gov/atr/public/hearings/ip/222655.pdf>.
  \item \textsuperscript{129} In Re \textit{Summit Technology, Inc.}, FTC Docket No. 9286, Complaint, online: FTC <http://www.ftc.gov/os/1998/03/summit.cmp.htm>.
  \item \textsuperscript{130} \textit{eBay}, supra note 95.
  \item \textsuperscript{131} 16 F.3d 1318 (Fed. Cir. 2010), [\textit{Princo II}].
  \item \textsuperscript{132} The party seeking an injunction must now demonstrate "(1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction." Edward H. Rice & Marina N. Saito, After Ebay: Can The ITC Offer Better Remedies Than District Courts? (Winter 2008), 19:2 Intellectual Property Litigation, online: Loeb & Loeb LLP <http://www.loeb.com/afterebaycantheitcofferbetterremediesthandistrictcourts/>. The FTC Report 2011, supra note 5 has since recommended that courts also incorporate into their injunction issuance analysis concerns over the leverage an injunction may give a patentee to obtain royalties that are greater than the economic value of an invention.
\end{itemize}
developed in which firms use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees". They concluded that the issuance of an injunction may not serve the public interest where the injunction is being used as a "bargaining tool to charge exorbitant fees….when the patented invention is but a small component of the product."\footnote{eBay, supra note 95, concurring opinion at 396-397.} The decision empowered courts to deny injunctions to patent trolls and the subsequent drop in injunctions being issued by U.S. district courts has been dramatic.\footnote{Chien & Lemley, supra note 134 at 13.}

The ITC, however, continues to grant the remedy of exclusion orders on the same basis as before eBay. Such orders are similar in effect to injunctive relief issued by U.S. district courts and prohibit the importation of infringing goods into the U.S. The ITC considered the eBay decision and concluded that it did not apply in the face of legislation specific to ITC proceedings.\footnote{The ITC considered the applicability of the eBay decision to Tariff Act of 1930, s. 337 actions in Certain Baseband Processor Chips and Chipsets, Transmitter and Receiver (Radio) Chips, Power Control Chips and Products Containing Same, including Cellular Telephone Handsets, Inv. 337-TA-543. The Commission rejected arguments that the test for injunctive relief set forth in eBay must be followed in s. 337 actions, finding that the Tariff Act of 1930 was a legislative modification of the traditional equitable test for injunctive relief. Robert J. Walters and Yefat Levy, White Paper - An Introduction To Remedies And Enforcement Proceedings In Section 337 Investigations At The International Trade Commission at 2-3, online: Intellectual Property Owners Association <http://www.ipo.org/AM/Template.cfm?Section=Business_Issues&Template=/CM/ContentDisplay.cfm&ContentID=17037>.} The ITC has since gained a reputation as being a more advantageous forum for patent holders with a lower standard for obtaining injunctive relief.\footnote{Ibid., citing a study by RPX Corp.} Post-eBay, trolls have flocked to the ITC to bring litigation in efforts to leverage the hold-up potential of exclusion orders. The number of ITC investigations involving non-producing entities increased from two in 2006 (pre-eBay) to 16 in the first three-quarters of 2011, highlighting the central role of injunction hold-up in the business model of patent trolls.\footnote{Andrei Iancu & Jay Chung, Real Reasons the Eastern District of Texas Draws Patent Cases - Beyond Lore and Anecdote, 14 SMU Sci. & Tech. L. Rev. 29, quoting Sam Williams, A Haven for Patent Pirates, Technology Review, (February 3, 2006). Iancu & Chung argue East Texas juries are not unusually...} Such forum shopping by trolls (and others seeking to enforce patents) is nothing new. The popularity of the Eastern District of Texas as a venue for patent infringement litigation rose rapidly over the last decade based on its reputation for being patent plaintiff-friendly.

\footnote{For example, see z4 Techs., Inc. v. Microsoft Corp., 434 F. Supp. 2d 437 (E.D. Tex. 2006) where a monetary award was found sufficient; Lemley & Shapiro, supra note 30 at 2036.}
The Patent Misuse Defence

Another means for courts to stem troll litigation is by broadening the doctrine of patent misuse, a defence to patent infringement. The doctrine of patent misuse, in short, prevents a patent owner from "extend[ing] the monopoly of his patent to derive a benefit not attributable to the use of the patent's teachings". The main inquiry is whether the patentee has "impermissibly broadened the scope of the patent grant with anti-competitive effect" by imposing conditions that derive their force from the patent.

In practice, U.S. Federal Courts have applied the doctrine narrowly and rarely find claims of patent misuse valid. The Federal Circuit's recent *Princo II* decision set a high standard to demonstrate patent misuse in patent pooling arrangements.

The decision narrowed the availability of the patent misuse defence in a number of ways. The Court imposed a requirement of "patent leverage": for a patent misuse defence to succeed, the patents asserted must significantly contribute to the misconduct at issue. The Court also required that the defendant show a reasonable probability that the non-essential patented technology (which had been pooled and licensed with essential technology) would have competed as an alternative technology in the market, absent the alleged misuse. Finally, the Court distinguished prior cases, which applied the patent misuse doctrine to prevent a patentee from "impermissibly broaden[ing] the 'physical or temporal scope' of the patent grant with anti-competitive effect". The Court explained that the defence of patent misuse is not available "to a presumptive infringer simply because a patentee engages in some kind of wrongful commercial conduct, even conduct that may have anticompetitive effects". Two dissenting judges disagreed with this narrow interpretation of patent misuse, arguing that past Supreme Court cases and legislation support a "vigorous misuse defense".

By permitting conduct that is admittedly anti-competitive but that is not controlled by patent law, the Court heightened the importance of antitrust action in situations of anti-competitive patent plaintiff-friendly and look at alternative explanations for the high number of patent cases brought in this jurisdiction.

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140 *C.R. Bard v. M3 Sys.*, 157 F.3d 1340, 1372 (Fed. Cir. 1998).
141 *Princo II, supra*, note 131.
142 Ibid. at 1331-33.
143 Ibid. at 1328 (quoting *Windsurfing Int'l, Inc. v. AMF, Inc.*, 782 F.2d 995, 1001 (Fed. Cir. 1986)).
144 Ibid. at 1329.
145 Ibid. at 1342 (dissenting).
However, there has been a notable lack of antitrust enforcement by agencies to address this gap between patent and competition law.\textsuperscript{147}

Since \textit{Princo II}, Barnes & Noble has asserted the patent misuse defence in ongoing patent infringement litigation brought by Microsoft. Barnes & Noble, which uses the Android operating system in its e-Reader, argues Microsoft misused its patents to minimize competition from devices that use the competing Android operating system.\textsuperscript{148} Microsoft has allegedly impermissibly "leveraged" or expanded the scope of its patents in-suit, as part of its Android licensing program, to demand and extract licensing fees for products that do not infringe the patents-in-suit, or any other Microsoft patents. Barnes & Noble is claiming that, for example, Microsoft's conduct includes (i) asserting that its patents cover every implementation of Android regardless of whether those devices in fact infringe any Microsoft patents—unless they take a license from Microsoft and (ii) showing "sample" patents to the original equipment manufacturers and asserting that Microsoft will sue on other, unidentified patents if the manufacturers work around the "sample" patents.\textsuperscript{149}

Barnes & Noble has also sent a letter to the U.S. Department of Justice ("DOJ") requesting an investigation into Microsoft's alleged anti-competitive behaviour surrounding its actions to suppress Android operating system competition and asking that the DOJ petition the ITC to

\textsuperscript{146} Sher, supra note 125 at 18.

\textsuperscript{147} Ibid., predicting a renewed interest in DOJ enforcement against pooling arrangements, since patent pools have evolved dramatically in scope, breadth and function from the pools involved in past reviews by the DOJ at 20-23; Mark A. Lemley, The Economic Irrationality of the Patent Misuse Doctrine (1990), 78: 6 California Law Review 78 at 1599 arguing antitrust laws can serve the same purposes as the patent misuse defence was designed to serve.

\textsuperscript{148} See the case \textit{In the Matter of Certain Handheld Electronic Computing Devices}, 337-769, U.S. International Trade Commission (Washington). Barnes & Noble has not been successful to date in its arguments. It claims Microsoft ",...has asserted patents that extend only to arbitrary, outmoded, or non-essential design features, but uses these patents to demand that every manufacturer of an Android-based mobile device take a license from Microsoft and pay exorbitant licensing fees or face protracted and expensive patent infringement litigation. The asserted patents do not have a lawful scope sufficient to control the Android™ Operating System as Microsoft is attempting to do, and Microsoft's misuse of these patents directly harms both competition for and consumers of all eReaders, smartphones, tablet computers and other mobile electronic devices." At para 2 of Affirmative Defence and Counterclaim, Barnes & Noble Response, online: Groklaw.com <http://www.groklaw.net/pdf2/MSvB&Nanswer.pdf>. On January 31, 2012, a U.S. International Trade Commission administrative judge granted Microsoft's motion to dismiss the patent misuse defence, although Barnes & Noble has since sought review of this decision. See: Susan Decker, "Barnes & Noble's Patent-Misuse Claim Against Microsoft Rejected", February 6, 2012, Bloomberg Businessweek, online: <http://www.businessweek.com/news/2012-02-06/barnes-noble-s-patent-misuse-claim-against-microsoft-rejected.html>. Barnes & Noble has also sent several letters to the U.S. Department of Justice complaining about Microsoft's patent (mis)use and requesting an investigation. The letters are available online at Groklaw: <http://www.groklaw.net/articlebasic.php?story=201111122291296>.

\textsuperscript{149} \textit{Princo II}, supra note 131.
dismiss Microsoft's action against Barnes & Noble.\footnote{150} The letter characterizes Microsoft's infringement litigation against Barnes & Noble as "akin to the conduct of what has come to be known as a "Patent Troll".\footnote{151} Regardless of whether the courts or antitrust authorities step in, the conduct alleged in patent misuse defences is strategic "gap zone" conduct that requires action to mitigate associated negative economic and innovation consequences.

(c) Legislative Responses: The \textit{Leahy-Smith America Invents Act}

In Canada, the economic significance of this type of behaviour has yet to be recognized, at least publicly, by legislators and policy makers. Legislative proposals for patent reform have long been percolating in the U.S., which has seen patent reform bills introduced in Congress every year since 2008.\footnote{152} Finally, in September 2011, the U.S. saw the passage of the \textit{Leahy-Smith America Invents Act} ("AIA"), the first major patent reform in over 50 years.\footnote{153} The AIA introduces wide-ranging and fundamental changes, moving from a first-to-invent to a first-to-file basis for patent grants, changing the post-grant review and inter-parties review processes, expanding the prior commercial use defense and narrowing the availability of tax strategy patents.\footnote{154} Most relevant to the issue of patent trolls, the AIA introduces new procedures for challenging patents and new rules for joinder in patent litigation.\footnote{155}

Two new review proceedings will be available under the AIA, each offering producing entities a new tool to challenge and invalidate patents held by trolls.\footnote{156} The AIA will introduce a form of post-grant review proceedings that enable anyone other than the patent owner to challenge the validity of a newly granted or reissued patent, on broad statutory grounds within nine months of

\footnote{150} Letter, from Eugene V. DeFelice, Vice President, General Counsel & Secretary of Barnes & Noble to the Honorable Christine Varney, Assistant Attorney General, Antitrust Division, USDOJ (March 28, 2011), online: Groklaw <http://www.groklaw.net/pdf3/675082-463533.pdf>. Barnes & Noble indicates that "Microsoft has shown in the past year that it will use any patents it owns to bully smaller companies out of the market with threats of litigation and forced licenses...".

\footnote{151} Ibid. at 3.


\footnote{154} "Congress Makes Substantial Changes to Patent Law with the America Invents Act," Cleary Gottlieb, September 21, 2011 at 1 [Cleary].

\footnote{155} Ibid. at 6.

\footnote{156} The review proceedings, conducted by the new Patent Trial and Appeal Board, will also impact the availability of court proceedings. The post-grant review petitioner cannot later assert in a proceeding before the Patent and Trademark Office or in a court action that the patent is invalid on any of the same grounds raised in the review (or that reasonably could have been raised during the review). As well, the petitioner must choose a forum. Once a civil action challenging the validity of the same patent has been initiated, review proceedings are no longer available, \textit{Ibid.} at 4.
the patent grant. The re-examination proceedings under prior law only allowed challenges on the grounds of a patent's novelty or non-obviousness. In order to have their petition granted, a challenger will be required to provide information showing it is "more likely than not" that a claim of the challenged patent is unpatentable or the claim must give rise to a "novel or unsettled legal question that is important to other patents or patent applications." The AIA will also introduce a specific procedure for challenging business method patents on any statutory ground, at any time, by a party that is sued for infringement of the business method patent. Business method patents, which are mainly software patents, have an intangible, fuzzy-edged nature making them a perfect target for trolls. The prior patent regime allowed for challenges of patents, including business method patents, only within a certain limited time period. Importantly, the AIA will now enable parties to seek a stay of the pending business method patent infringement action once a challenge to the validity of the business method patent is launched. The business method patent review procedure is likely to prove less expensive for patent troll targets than full-scale litigation.

The AIA blocks the joinder of unrelated parties as defendants in the same patent infringement action. It provides that defendants may only be joined to the same action if (i) the right to relief is asserted with respect to or arising out of the same transaction or occurrence relating to the same product or process and (ii) there are questions of fact common to all defendants (or counterclaim defendants) in the action. Naming a lengthy list of unrelated defendants is a favourite tactic of patent trolls. The AIA changes make joinder of multiple defendants less likely, driving up the cost of litigation for patent trolls and, it is hoped, driving down their litigiousness.

Much of the AIA, including the challenge process for business method patents, has yet to come into effect, making it too early to measure its impact. Despite being in its early stages, the legislation seems in theory to be a positive step in the battle against trolls.

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157 AIA, supra note 153 at §324 (a) and (b).
158 Bessen & Meurer, supra note 41 at 25. Recent cases such as Bilski v. Kappos (2010), 130 S. Ct. 3218 have considered whether business methods should be patentable at all.
159 Cleary, supra note 154.
160 Ibid. at 6.
161 135 U.S.C. § 299(a) (2011); See also Holly Forsberg, Diminishing The Attractiveness Of Trolling: The Impacts Of Recent Judicial Activity On Non-Practicing Entities (Fall 2011), 12:4 PGH. J. Tech. L. & Pol'y at 3.
163 Many of the changes under the AIA will take effect in September 2012. See Cleary, supra note 154 at 6. The prohibition on naming multiple defendants was effective immediately, but initial data is unclear on whether there has been a deterrent impact on patent trolls. The data indicates a steep increase in suits involving patent trolls in 2011 (see Appendix A), which may suggest trolls are simply filing multiple suits
(d) Regulatory Agency Responses

The basic regulatory approach to the interface between intellectual property policy and competition policy is rooted in the belief that the two regimes are complementary. Competition authority guidelines acknowledge that intellectual property law and rights play a role in promoting innovation.\textsuperscript{165} There is international consensus that the mere exercise of intellectual property rights should not be equated with the possession of market power.\textsuperscript{166} As the Canadian IP Guidelines explain, the Canadian Competition Bureau will rarely challenge conduct involving "the exercise of the owner's right to unilaterally exclude others from using the IP".\textsuperscript{167}

(i) Guidance from Antitrust Agencies

Yet in generally limiting regulatory agency intervention to instances that go beyond the exercise of exclusionary rights, competition authorities must be careful not to relinquish their responsibility to address the market issues resulting from anti-competitive conduct that is sheltered inappropriately under the umbrella of patent law.

For example, despite the existence of a specific provision in Canadian competition law focused on the abuse of intellectual property rights and the declaration in the Canadian IP Guidelines that resort will be had to that provision in appropriate cases, enforcement under this provision has been virtually non-existent. Section 32 of the Canadian \textit{Competition Act} provides for special remedies where an intellectual property right has been used to prevent or lessen competition unduly.\textsuperscript{168} In the case of a "mere exercise" of intellectual property rights, the Canadian IP Guidelines state that the Commissioner will consider referring the matter to the Attorney General of Canada, who may commence proceedings under section 32. For these purposes, the Commissioner defines the "mere exercise" of an intellectual property right as the exercise of the

where they would have joined the defendants to a single suit in the past (or, worse, that patent troll suits are continuing to rapidly multiply in number).

\textsuperscript{164} Some argue that the changes to the basis of patent grants made by the AIA will harm small inventors and could reduce patent quality, with negative impacts on innovation; Amy Schatz and Don Clark, "Patent Overhaul Nears", Wall Street Journal, (September 7, 2011), online: WSJ <http://online.wsj.com/article/SB10001424053111904537404576554633952918662.html> referring to a comparative study by University of Pennsylvania law professors David S. Abrams and R. Polk Wagner on the Canadian patent system that suggests moving to a first-to-invent standard for granting patent protections could reduce patent quality and result in fewer patents issued to individuals.

\textsuperscript{165} See for example: Canadian Competition Bureau, Intellectual Property Enforcement Guidelines, Enforcement Guidelines (September 2000) at 1 [Canadian IP Guidelines] ("Adequate protection of intellectual property (IP) plays an important role in stimulating new technology development, artistic expression and knowledge dissemination, all of which are vital to the knowledge-based economy").

\textsuperscript{166} OECD, \textit{Competition Policy and IPRs}, DAFFK/CLP(98)18 (16 Sept. 1998) at 8. In the past, for example, the mere possession of patent rights gave rise to a presumption of market power in U.S. federal law. This was overturned in \textit{Illinois Tool Works, Inc. v. Independent Ink, Inc.} 547 U.S. 28 (2006).

\textsuperscript{167} Canadian IP Guidelines, \textit{supra} note 165 at ss. 4.2 and 4.2.1.

\textsuperscript{168} RSC 1985, c C-34.
owner's right to unilaterally exclude others from using the intellectual property right or to decide whether to use or not use the intellectual property right itself.

At one point, amendments to Canadian competition legislation repealed the equivalent provision to the current section 32, based on the perception that the existing remedies under the Patent Act were sufficient. In 1946, the Competition Act provision was reinstated after a report of the Commissioner found that the Patent Act inadequately addressed anti-competitive abuses of patents. Despite the provision's long-standing existence, re-introduction into the Competition Act, and recognition in the Canadian IP Guidelines, no contested case has ever been brought to trial under section 32. 169

Another example where the premise of agency guidance seems inapplicable to trolls is the Canadian IP Guidelines' statement on licensing. Licensing is considered "pro-competitive, because it facilitates the broader use of a valuable IP right by additional parties" in the vast majority of cases. 170 But the logic that licensing facilitates broader use of patent rights does not apply in many cases involving patent trolls. The targets of troll licensing efforts are selected because the technology at issue is already in use, so the licensing activity does not result in any broader use of the patent right. The imposition of a license, even if it is within the scope of the intellectual property right, is more likely to reduce competition—either by raising costs to the party using the allegedly infringing technology or by causing the product to be pulled from the market because it is no longer economic. Licensing activities should not be presumed to be pro-competitive when they are a far stretch from the activity of introducing new technology. 171

Slowly, it would appear that some antitrust agencies are beginning to appreciate the economic and market costs associated with the enforcement gap at the interface of patent and competition law and to modify guidance accordingly. The European Commission is in the process of a public consultation on the revision of the rules for the assessment of licensing agreements for the transfer of technology under E.U. competition law. It recently issued a report, which will be an input into the revision process, examining the interface of intellectual property rights and competition policy and reviewing existing literature and cases on anti-competitive conduct involving intellectual property. 172 Another agency approach has been to issue specific antitrust guidelines on the treatment of patents. Korea issued patent-specific guidelines in 2011 that

169 The provision was first included in 1910, in the precursor legislation to the current Competition Act.
170 Canadian IP Guidelines, supra note 165 at s. 4.1.
171 Ewing & Feldman, supra note 53 at 37 suggest antitrust agencies may need to reconsider the general principle that licensing is pro-competitive when it has become "separated so far from the activity of introducing new technologies".
172 Assessment of Potential Anticompetitive Conduct in the Field of Intellectual Property Rights and Assessment of the Interplay between Competition Policy and IPR Protection COMP/2010/16 November 2011 Pierre Regibeau (CRA, Imperial College and CEPR) and Katharine Rockett (University of Essex and CEPR).
delineate when patent licensing will be considered anti-competitive. This approach goes further than the general intellectual property guidelines that already exist in many jurisdictions, and may be helpful to clarify the approach of antitrust agencies.

(ii) Enforcement by Antitrust Agencies

On the enforcement side, the DOJ considered two recent transactions involving the acquisition of patents. CPTN, a holding company owned by Microsoft, Oracle, Apple and EMC, sought to acquire patents and patent applications from Novell. In April 2011, the DOJ announced that it would require changes to the acquisition agreements to address antitrust concerns over the impact of the deal on the ability of open-source software developers to continue to innovate. The DOJ required, among other things, that the acquisition of all of the Novell patents be subject to certain widely used open-source licences and that CPTN could not later limit which patents were available under that license. The DOJ called the changes "necessary to protect competition and innovation in the open-source software community" and referred to striking a balance between patent and antitrust law. More recently, the DOJ referred to the CPTN acquisition as unlikely to harm competition because the change in ownership would not enable Apple to avoid commitments made by Novell to offer perpetual, royalty-free licenses for the Linux software at issue.

In the recent Google acquisition of Motorola, both the European Commission and the DOJ took a careful look at the implications of the transaction on access of competitors to standards essential patents and determined that the acquisition would not significantly change existing market dynamics. As part of its investigation of the transaction, the DOJ also considered the acquisitions of certain patents by Apple, Microsoft and RIM. The common concern was that the acquiring parties might have the incentive or ability to exploit ambiguities in commitments to license standard essential patents on FRAND terms, in order to hold-up rivals and reduce competition. Commitments by Apple and Microsoft to license standard essential patents on FRAND terms as well as their commitments not to seek injunctions in disputes involving standard essential patents lessened, but did not eliminate, the DOJ's concerns over "potential inappropriate use of SEPs [standard essential patents] to disrupt competition". The DOJ concluded that with respect to RIM and Microsoft's acquisition of Nortel patents, the companies' "low market shares in mobile platforms would likely make a strategy to harm rivals either

173 Stefano Berra, Korea Introduces Antitrust Guidelines for Patent Use, January 19, 2012. The guidelines also focus on protecting small and medium-sized businesses. The guidelines were not available in English at the time of writing.

174 Press Release, Department of Justice, CPTN Holdings LLC and Novell Inc. Change Deal in Order to Address Department of Justice's Open Source Concerns (April 20, 2011).

175 Press Release, Department of Justice, Statement of the Department of Justice's Antitrust Division on Its Decision to Close Its Investigations of Google Inc.'s Acquisition of Motorola Mobility Holdings Inc. and the Acquisitions of Certain Patents by Apple Inc., Microsoft Corp. and Research in Motion Ltd. (February 13, 2012) [DOJ Google/Motorola Clearance Decision].

176 Ibid.; EC Google/Motorola Clearance Decision, supra note 123.
through injunctions or supra-competitive royalties based on the acquired Nortel SEPs unprofitable.\footnote{Ibid.} The conclusion may not have been the same in a situation involving higher market shares and, at any rate, the DOJ indicated it would continue to monitor the use of such patents in the wireless device industry.\footnote{Ibid.}

Although these cases did not involve trolls, the issues trace back to the same concerns over patent hold-up and illustrate the increasing need for antitrust agencies to reconcile their analysis of antitrust with the frontiers of patent law. The recent surge in troll activity implicates the exercise of legitimate intellectual property rights and seriously impacts the innovation goals of competition law. The importance of antitrust agency scrutiny and action is two-fold: it can immediately stop specific instances of patent abuse and, perhaps more importantly, it acts as a warning signal that such activities are being monitored. To date, patent trolling has been a low-risk activity from an antitrust enforcement perspective. More competition agency scrutiny will signal to patent trolls that their activity could be subject to enforcement action, achieving a wider deterrent effect.

(iii) Patent Regulation Reform

The other half of the regulatory equation involves changes to the patent examination, issuance and review processes. As discussed above, clear patent notice paves the way for competition; it lets firms know what technology is or is not patented to enable better-informed, lower-risk research and development decisions. Changes to the patent system to improve the quality of patents issued would reduce the fodder available to trolls. In this regard, the FTC Report includes recommendations to:

- make patent claims more definite and improve the utility of descriptions in patents, for example by requiring claim terms to be defined;
- enhance the content of the patent prosecution history to make it a better source for interpreting the scope of patent claims,\footnote{The prosecution history is the information exchanged between applicants and patent examiners, which can be useful in ascertaining the meaning of claims. FTC Report 2011 \textit{supra}, note 5 at 112.} and
- improve the ability of third parties to foresee evolving patent claims.\footnote{\textit{Ibid.} at 116-125. Third parties involved in the FTC hearings explained the problems they faced from unpublished patents and unanticipated claim amendments, which can make it much more difficult to determine the final, issued form a patent claim will take and whether the third party's product will infringe on unpublished or amended patents. See for example the discussion of patent continuation and division, above. The FTC Report recommends, for example, that all patents be published 18 months after filing (this is not required for U.S. patent applications filed domestically but not internationally) and changes to the ability to broaden claims after the filing date.}
Even if fast and effective reforms were implemented, the U.S. patent regime, in part due to systemic problems in patent issuance, has a legacy problem arising from the issuance of massive numbers of patents in recent history. 181 Since patents have a 20-year term, this glut of already-issued patents will persist to provide plenty of fuel for trolls. The massive patent inventory suggests that changes to the patent regulatory system alone may be insufficient to solve the patent troll problem in the short term.

6. Conclusion

Patent trolls highlight the gap between the competition and patent regimes, and point to the need for changes to one or, more likely, both of these systems. Although trolls bear the criticism as a convenient example, they have merely exploited weaknesses in patent and antitrust law and enforcement. They are not to blame for the systemic flaws that enabled their exploitation. As Shapiro describes, the real problem is that there are certain "fact patterns under which the current U.S. patent system allows patent holders to capture private rewards that exceed their social contributions" and the result of such rewards is deadweight loss from the patent system and discouragement of innovation. 182 While not the cause of the gap, the anti-competitive conduct of trolls does cry out for enforcement action by competition authorities.

In situations where the patent system is not promoting innovation and instead is being used to engage in strategic hold-up behaviour, parties should not be able to "hide" behind patent law as protection from antitrust scrutiny. As a past Canadian Commissioner of Competition explained, "[c]ontinual innovation is both one of the hallmarks of competition, and an important source of competition in the marketplace. To the extent that a strong and effective intellectual property framework contributes to this innovation, it supports competition." 183 The application of patent law may no longer contribute to innovation or support competition when the purchaser of a patent is interested only in the right to exclude, not the economic value of the underlying invention. Such situations call for a realignment of patent and antitrust law, through judicial, legislative and regulatory means.

However, revisions to competition or patent legislation or guidelines cannot remedy the gap between patent and competition law unless regulatory authorities take the initiative in enforcement. At least since the modernization of Canada's competition law in 1986, a succession of Competition Bureau officials have asserted that as framework law the *Competition Act*


183 Sheridan Scott, Commissioner of Competition, Competition Bureau, Competition Law and Intellectual Property Law: Getting the balance "just right", University of Victoria Faculty of Law International Intellectual Property Law Symposium (July 15, 2006) [emphasis added].
governs business conduct everywhere except where other laws have stepped in with more specific regimes. Despite these assertions, Canadian competition authorities appear extremely reluctant to take enforcement action where patents are involved, limiting their activity to the issuance of guidelines. Like speed limits, guidelines without enforcement are ignored. As for the interplay between patent and competition authorities, until very recently and still in some jurisdictions, there seems to be a game of hot potato between the two where each leaves the responsibility for correcting anti-competitive conduct to the other. Both authorities cannot simply assume it is the other's problem and use this as the basis for a hands-off approach. Granted the issues are complex, but they are also pressing, and it is time to mind the gap.
Appendix A

Patent Lawsuits Involving NPEs Over Time

Appendix B

Operating Company Parties in NPE Lawsuits by Sector

Appendix C

Ranking of Operating Companies by Number of NPE Lawsuits

<table>
<thead>
<tr>
<th>No.</th>
<th>Company Name</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hewlett Packard</td>
<td>15</td>
<td>25</td>
<td>25</td>
<td>33</td>
<td>30</td>
<td>128</td>
</tr>
<tr>
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<td>25</td>
<td>35</td>
<td>38</td>
<td>126</td>
</tr>
<tr>
<td>3</td>
<td>Samsung</td>
<td>20</td>
<td>12</td>
<td>8</td>
<td>23</td>
<td>38</td>
<td>101</td>
</tr>
<tr>
<td>4</td>
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<td>17</td>
<td>21</td>
<td>28</td>
<td>100</td>
</tr>
<tr>
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<td>6</td>
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<td>20</td>
<td>34</td>
<td>96</td>
</tr>
<tr>
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<td>20</td>
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<td>96</td>
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<tr>
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In preparing these data, PatentFreedom has removed administrative duplicates (e.g., consolidations, change in venue, etc.), so that these numbers reflect the actual count of distinct NPE lawsuits, year-by-year. Further information on the methodology is available here: https://www.patentfreedom.com/methodology/.