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*P*atent assertion entities & privateers: Economic harms to innovation and competition

BY ROBERT G. HARRIS*

This article assesses aggressive rent-seeking activities by patent assertion entities (PAEs), especially in patent-thick industries. Patent thickets are “target-rich” environments, providing ample opportunities for rent-seeking and abuse of patents by PAEs. Fundamental differences in the strategic interests of practicing entities (PEs) and PAEs increase the opportunities for, and economic harm caused by, PAEs engaging in patent hold-up. PAEs exploit deficiencies in patent policy and enforcement, including the use of injunctions, excessive damages awards, and costly settlements stemming from actual or threatened litigation, the high cost of which increases “hold-up value.” The article also examines the threat to competition and innovation caused by “privateering”: the transfer of patents from PEs to PAEs. While there

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may be limits on the use of antitrust to moderate all of the harms caused by PAEs, cases involving privateering are ripe for investigation, prosecution, and remedy by enforcement agencies and private antitrust actions.

KEY WORDS: *patent licensing, technological change: government policy, innovation and invention: processes and incentives, intellectual property rights, anticompetitive*

I. OVERVIEW

This article addresses the problems of aggressive rent seeking by patent assertion entities (PAEs). These problems are widespread and growing rapidly: “Over a decade the amount of [nonpracticing entity]¹ litigation has grown from less than 5% of all U.S. patent litigation to over 60%.”² Moreover, PAEs are increasingly targeting the most innovative sector of our economy, startups. Robin Feldman’s recent survey of venture capitalists and startups found that seventy percent of the venture capitalists have portfolio companies that have received patent demands, with roughly one in three startup companies reporting such demands. She also found that the “vast majority of patent demands against the startup companies come from entities that license or litigate patents as their core activity.”³

This article is especially concerned with actions of PAEs when patent thickets and patent-thick products and systems are present. Patent thickets are “target-rich” environments that are particularly attractive to PAEs, because they provide ample opportunities for rent-seeking and

¹ Though different authors use different terms and define those terms differently, this article uses the term PAEs throughout—except when quoting from other sources—to include nonpracticing entities and patent monetization entities.

² James Bessen & Michael J. Meurer, *The Direct Costs From NPE Disputes*, 99 CORNELL L. REV. 29 (forthcoming 2014), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2091210.

³ Robin Feldman, *Patent Demands & Startup Companies: The View from the Venture Capitalist 2* (U. Cal. Hastings Research Paper No. 75Dec. 18, 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2346338.

abuse of patents.⁴ Section II will explain why aggressive patent assertion is particularly harmful in patent-thick products and systems, such as computers, smartphones, and software. It will also explain why technological developments will almost certainly increase the number and “density” of patent thickets, thereby providing even more target-rich environments for PAEs, as well as the magnitude of economic rents that can be earned by aggressive patent assertion activities.

While there are admittedly instances of patent abuse by practicing entities (PEs), this article focuses on problems caused or exacerbated by PAEs in patent thickets and by the transfer of patents from PEs to PAEs. Section III addresses the fundamental differences in the strategic positions and interests of PEs and PAEs, and explains why those differences affect the conduct of PAEs and increase the opportunities for, and economic harm caused by, their rent-seeking conduct and efforts to engage in patent hold-up. This section also lays the foundation for section VI, a discussion of the anticompetitive harm that can be caused when PEs transfer patents to PAEs. I focus on instances where PAEs have incentives, as the results of such asset transfers, to assert the transferred patents against competitors of the PEs that originally had owned the patents. This has been termed patent privateering.⁵

Given these strategic differences between PEs and PAEs and the rapid growth in target-rich patent thickets, it is not surprising that there have been significant increases in the number of PAEs, the number of patents owned by PAEs, and the number of patent assertions and lawsuits by PAEs. While PAEs cause harm by exploiting flaws in the patent system,⁶ they compound that harm through the process of

⁴ For this reason, the term patent minefield may be a more descriptive term than patent thicket.

⁵ Thomas L. Ewing, *Indirect Exploitation of Intellectual Property Rights by Corporations and Investors*, 4 HASTINGS SCI. & TECH. L.J. 1 (2011).

⁶ Jorge Lemus & Emil Temnyalov, *Patent Assertion and the Rate of Innovation* 51 (Oct. 31, 2013), available at <http://ssrn.com/abstract=2308136> (“[T]hink of trolls as opportunists that exploit and thereby illuminate flaws in the patent system . . . Patent reform can then be focused more appropriately on the systemic issues that give rise to patent trolls—on granting patents only to those who develop nonobvious inventions and providing remedies for infringement that are commensurate with the scope of the invention.”).

patent portfolio disaggregation, which multiplies the effects of excessive damage awards and asymmetric litigation costs. Section IV reviews recent empirical studies regarding the patent assertion activities of PAEs, which, by any measure, are growing dramatically. Given the substantial increase in PAE litigation, it is essential that one consider the date range of any empirical study of PAEs or comparison of various patent entities. Because PAE activity has increased so markedly in recent years, any study that uses data from more than a few years ago is now obsolete. What the Federal Trade Commission could reasonably characterize as the “*evolving* [intellectual property] marketplace”⁷ just three years ago has since undergone a *revolution* in the ownership and assertion of patents by PAEs.

Section V discusses the types of economic harm caused by PAEs and explains how PAEs exploit deficiencies in patent policy and enforcement, including the granting of injunctions (or exclusion orders), excessive patent infringement damage awards, and costly settlements stemming from excessive actual or threatened litigation. Because of the extremely high transaction costs of defending patent litigation, the settlement value is often determined by the “hold-up value” of avoiding those costs. These are expected costs of *not* settling, given that a court and jury may accept excessive damages demands proposed by the PAE. Under these circumstances, the technology user would agree to a settlement in excess of the economic value of the patents involved.⁸ Section V also reviews recent empirical research that attempts to distinguish the patent enforcement conduct and outcomes of PEs from those of PAEs and measure the effects of PAEs’ patent assertion activities. These estimates substantially under-

⁷ FED. TRADE COMM’N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION (Mar. 2011), *available at* <http://www.ftc.gov/sites/default/files/documents/reports/evolving-ip-marketplace-aligning-patent-notice-and-remedies-competition-report-federal-trade/110307patentreport.pdf> (emphasis added).

⁸ Patent hold up is hardly new. See Gerard N. Magliocca, *BlackBerries and Barnyards: Patent Trolls and the Perils of Innovation*, 82 NOTRE DAME L. REV. 1809 (2007) (describing “patent sharks” from the nineteenth century, who bought “dormant agricultural patents” and asserted them against practicing farmers).

state the harm caused by PAEs, because much of the empirical literature does not measure prelitigation costs such as settlements achieved under the threat—but not the actual filing—of litigation. Nor does most of the research attempt to measure lost management and engineering resources caused by PAE aggression, or the increased risk aversion away from innovating in technologies that might be rife with PAE activities—technological categories that presumably grow as PAE activity increases. Moreover, given the dramatic increase and continued growth of PAEs and their assertion activities, any estimate of past harm surely understates future harm.

Finally, section VI addresses the rapidly growing threat to competition and innovation caused by the transfer of patents from PEs to PAEs. This conduct has been referred to in the literature as privateering. While there may be limits on the use of antitrust or competition policy tools to moderate all of the harms caused by PAEs, cases involving privateering are ripe for investigation, prosecution, and remedy by competition policy enforcement agencies and private antitrust actions. Section VI delineates some of the most critical concerns raised by such transfers and explains why antitrust authorities should either prevent such transfers or, at a minimum, place conditions on the conduct of the PAE to whom the patents are transferred and monitor the activities of privateering PAEs to ensure compliance with those conditions.

II. PATENT THICKETS: “TARGET-RICH” ENVIRONMENTS FOR PAES

A. *Patent thickets & patent-thick products*

The patent density of products covers an extraordinary range, from products that read on a single patent (so “the patent is the product,” as in “a better mousetrap”) to products that embody thousands of patents. When a very large number of patents read on a product, those patents constitute a patent thicket; I will refer to the products inhabiting patent thickets as patent-thick products. Smartphones, for example, are estimated to embody as many as 250,000 patents,⁹ a

⁹ Colleen V. Chien, *Reforming Software Patents*, 50 HOUS. L. REV. 325, 336 (2012).

substantial share of which have been declared by the patent owners to be standards-essential.¹⁰

As a general proposition, computer hardware (broadly defined) represents a substantial share of damages awards to PAEs.¹¹ Consistent with this, Love found that “[o]f all infringement claims filed by trolls in the last three years of the asserted patent’s term, 88% allege infringement of patents related to computers or electronics. 65% allege infringement of software patents.”¹² In a study by Bessen, Meurer, and Ford, “[a]lmost two thirds of the [defendant] firms are technology firms, including software and communications firms, and these firms, on average, spend a lot on R&D and have very substantial intangible assets.”¹³ Fischer and Henkel found that “[t]he probability that a traded patent is acquired by a troll rather than a

¹⁰ See Phil Goldberg, *Stumping Patent Trolls on the Bridge to Innovation* 3 (Progressive Policy Institute Policy Brief 2013), available at http://www.progressivepolicy.org/wp-content/uploads/2013/09/10.2013-Goldberg_Stumping-Patent-Trolls-On-The-Bridge-To-Innovation.pdf (“[P]rograms, devices, and machines often incorporate many patented technologies, many [of which] use overlapping technologies to operate on common platforms, such as Wi-Fi networks, or to conform with industry standards. This convergence of a massive influx of patents, complex products incorporating many technologies, and widespread adoption of standardized protocols and platforms has created seemingly endless opportunities for patent holders to allege that others’ products are infringing on their patents.”).

¹¹ Richard J. Gilbert, *The Rising Tide of Patent Damages* (III Lisbon Conference on Competition Law and Economics 3 2010), available at http://works.bepress.com/cgi/viewcontent.cgi?article=1032&context=richard_gilbert.

¹² See Brian J. Love, *An Empirical Study of Patent Litigation Timing: Could a Patent Term Reduction Decimate Trolls Without Harming Innovators?*, 161 U. PA. L. REV. 1309, 1312 (2013) (“Notably, NPEs’ domination of late-term litigation is almost completely attributable to firms that do nothing more than hold patents. NPEs that many do not consider trolls—universities and individual inventors, in particular—do not drive the results.”).

¹³ James E. Bessen, Michael J. Meurer & Jennifer Laurissa Ford, *The Private and Social Costs of Patent Trolls* 12 (Boston U. School of Law, Law & Econ. Research Paper No. 11-45, Sept. 19, 2011), available at <http://ssrn.com/abstract=1930272> (finding also that PAE litigation is “focused on software and related technologies, . . . targets firms that have already developed technology, and . . . involve[s] multiple large companies as defendants”).

practicing entity increases . . . in the scope of the patent, and . . . in the patent density of its technology field”¹⁴ Robin Feldman has found through her survey research that “modern patent trolling has had perhaps the largest impact on technology-heavy industries such as software, smartphones, and computers.”¹⁵

A product with many patents generally means that there are many patentees. This can severely exacerbate the problem of Cournot complements by increasing the rewards to opportunistic rent seeking through patent assertion. As Lemley and Shapiro point out:

The Cournot-complements effect arises when multiple input owners each charge more than marginal cost for their input, thereby raising the price of the downstream product and reducing sales of that product As a result, if multiple input owners each control an essential input and separately set their input prices, output is depressed even below the level that would be set by a vertically integrated monopolist [T]he royalty stacking problem is likely to be worse the greater the number of independent owners of patents that read on a product.¹⁶

Turner has modeled firms’ decisions of whether to develop new technology as endogenously determined by the rate of invention and patenting in the economy overall. His results show that “an increase in input complementarity lowers equilibrium invention, and typically raises the rate of patenting, by both increasing dispute costs paid and by increasing the payoff to would-be patentees. This predicts that troll behavior should be most harmful in industries where input complementarities are greatest.”¹⁷

¹⁴ Timo Fischer & Joachim Henkel, *Patent Trolls on Markets for Technology – An Empirical Analysis of Trolls’ Patent Acquisitions 2* (Center for Economic Policy Research Apr. 2011), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1523102.

¹⁵ Feldman, *supra* note 3, at 7.

¹⁶ Mark A. Lemley and Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991 2013 (2007).

¹⁷ John L. Turner, *Patent Thickets, Trolls and Unproductive Entrepreneurship* 6 (May 1, 2011), available at <http://ssrn.com/abstract=1916798>. I am not suggesting that patenting is per se bad when there are many complements, but that the patent enforcement system does not take adequate account of the externalities of Cournot complements.

It is a near certainty that the number of Cournot complements and the potential for hold-up in patent thickets will continue to grow for several reasons. The continuing excessive granting of poor quality patents in information and communication technologies will increase opportunities for abuse of those patents. Devices themselves are becoming even more highly integrated, so that the number of components, features, and functionalities embodied in the devices causes them to “read” on a rapidly growing number of patents. Because interoperability requires industry standards, the number of complements will grow as the number of standards practiced by integrated devices increase (such as by adding Near-Field Communications, Wi-Fi or Bluetooth capabilities to a smartphone). And, in many cases, devices embody more than one generation of a standard (such as 3G and LTE) to ensure interoperability and backward compatibility. I will refer to the owners of these ever-growing numbers of complementary patents as “co-patentees.”¹⁸ A central tenet of this article is that the rights and interests of co-patentees should play a much greater role in the design and enforcement of patent laws. Nevertheless, when many patents, owned by multiple patentees, are practiced by a product, the potential and incentive for patent aggression increases.

Moreover, the very nature of today’s patent-thick products means there are so many technical complements that it would be impossible for any single company to develop them all—or even a substantial share of them. Therefore, each patentee is interdependent with all of the co-patentees, because the economic value of the technology of any one patentee depends on the existence, nature, and quality of the technologies—and so the innovations—contributed by other patent holders. Such a patent thicket constitutes an “innovation commons,” in the sense that none of the contributing firms could conduct all of the innovation necessary to create integrated, interconnected, multifunctional products. Thus, abuses by some patentees can create an “anticommons,”¹⁹ in the sense

¹⁸ These arguments can be generalized beyond co-patentees to include other contributors of innovations that have not been patented, or are not even patentable, but nonetheless contribute to the economic value of the patent-thick product.

¹⁹ Hardin’s “commons” metaphor “highlights the cost of overuse when governments allow too many people to use a scarce resource, [but] it overlooks the possibility of underuse when governments give too many people

that attacks on one or more alleged infringers of a few patents among many in patent-thick products also constitute attacks on the innovation commons. Ironically, the more reasonably most co-patentees act, (such as by cross-licensing at zero royalties or by seeking reasonable royalties), the greater the potential economic rents to those who commit patent abuse. This is because the lower aggregate royalty burden associated with the technologies of the other patent holders will offer the PAE or privateer the opportunity to collect higher royalties without causing the marginal cost, and so the price, of the product to rise to a point where downstream demand is significantly reduced or eliminated.

Due to the massive numbers of patents involved in patent-thick products, individual patents have correspondingly smaller economic value as a share of the total patent-thick product's value,²⁰ not only because of the sheer number of patents involved but, also, because each patent covers a technology that is useful only in combination with other patented technologies or innovations.²¹ Unfortunately, however, the current patent prosecution system has a strong tendency to over-reward those individual patent holders who most aggressively prosecute their patents, thereby harming co-patentees, consumers, downstream producers, co-patentees, and incentives for innovation. Excessive returns to some patent holders increase marginal costs of product manufacturers, raising prices to consumers or reducing funds to invest in further innovation or both.

Moreover, the more patents that read on a product, the more difficulty there is for PEs to identify those patents or patentees, the more low-quality patents there are likely to be, and the greater the opportu-

rights to exclude others," thereby causing "the tragedy of the anti-commons." Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation?*, 280 *SCIENCE* 698, May 1998 (discussing Garrett Hardin, *The Tragedy of the Commons*, *SCIENCE*, Dec. 1968, at 1243–48).

²⁰ Indeed, in many—if not most of these cases—an individual patent has *no value* except when used in combination with many other patents.

²¹ Gilbert explains that most PAEs receiving large payments in the computer hardware business either never produced a commercial product, or were in the process of exiting the industry. Further, most patents asserted by PAEs address only a small feature that does not define the whole product. Gilbert, *supra* note 11, at 3, 8–10.

nity for patent hold-up. Thus, it is no surprise that a substantial share of PAE assertions target patent-thick products.²² Whereas PEs have strong economic interests in promoting and protecting the commons, PAEs have an interest in maximizing their profits, even if their actions collectively harm the commons.

B. Patent thickets and the patent system

A patent is a government grant of the power to exclude others from using an invention, which creates a property right that can be licensed or sold (by selling title to the patents themselves).²³ The Patent Clause of the Constitution was intended by the framers as a limit on the ability of Congress to grant patents: Patents were permitted only insofar as there was a quid pro quo in the form of a public benefit in promoting innovation.²⁴ Rules that permit overcompensation to patent holders at the cost of inhibiting innovation are contrary to these intended constitutional limits. If one believes that the economic returns to patents are necessary to provide incentives for investment in innovation, then the damages rewarded—or settlements realized by—patent assertions should be aligned with the economic value of the patents.²⁵

²² As Boston University legal researchers James Bessen, Jennifer Ford, and Michael J. Meurer have found, PAE litigation is heavily concentrated in the information technology sector, with approximately seventy-five percent of PAE-asserted patents covering computer and communications-related inventions, and sixty-two percent covering software-related patents. Bessen, Meurer & Ford, *supra* note 12.

²³ Standard setting organizations typically require members to commit to licensing their patents on fair, reasonable and nondiscriminatory (FRAND) terms to prevent patentees from “holding up” those who adopt the standard in making or selling the standard-based products.

²⁴ See James A.D. White, *Misuse or Fair Use: That Is the Software Copyright Question*, 12 BERKELEY TECH. L.J. 251 (1997) (“The economic philosophy behind the clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare.”).

²⁵ The smaller the number of actual or potential patents that might read on a product, the more reasonable it is to assume that a potential infringer could avoid infringement or seek licenses. In contrast, it is practically impossible to avoid infringement in when a patent thicket exists.

Even in patent thickets involving many patentees, patent enforcement is still typically a two-party affair: The right of one patentee (the plaintiff) to exclude versus the alleged infringement of that right by the (defendant's) "infringing product." The key issues are (1) whether the patents-in-suit are valid and (2) whether the product infringes those patents. If the allegedly infringing product involves a single patent (or small number of patents), this two-party "game" makes some sense. When a "product is the patent" is involved in patent litigation, there are no (or very few) co-patentees involved and therefore no consideration of the significant externalities of the assertion or litigation on other patent holders. Given the high degree of technical complementarity across patents in patent-thick products,²⁶ this two-party approach—the patentee versus the alleged infringer—fails to adequately account for the contributions of the many co-patentees, without whose technical complementarities the patents-in-suit would have little if any value.²⁷

It is very telling that there is case law that uses the term "unpatented" when referring to all patents other than the patents-in-suit, reflecting the assumption that the rights and interests of those who hold such patents play little or no role in making key arguments or decisions (whether to grant an injunction, damages, or ongoing royalties).²⁸ In fact, in the case of a patent-thick product, other patent-

²⁶ When products read on many thousands of patents, it must be true that a very large share of those patents are technical complements to other patents and therefore have little or no economic value standing alone.

²⁷ Only the patents-in-suit seem to matter in most patent litigation. In very thick patent thickets, even counting—much less identifying—those myriad co-patentees is practically impossible. Moreover, in litigation, the alleged infringer may not have an incentive to produce evidence of co-patents for fear of litigation from those co-patentees (especially if the defendant has not acquired rights to use those other patents).

²⁸ Brian J. Love, *Patentee Overcompensation and the Entire Market Value Rule*, 60 STAN. L. REV. 263, 268 n.15 (2007) ("The term 'unpatented' is meant to convey that the [other] components are not covered by the patent at issue in the case—not that they are literally unpatented. This convention is also followed in the case law. See *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1551 (Fed. Cir. 1995) (explicitly defining 'unpatented' as 'not covered by the patent in suit').").

ees may well contribute a substantial share—perhaps nearly all—of the economic value of the product, so proper incentives to innovate must ensure that all—or at least a substantial share—of the patentees are rewarded adequately for their innovations, whether through receiving royalties or forgoing royalties through cross-licensing among patentees. Richard Gilbert has emphasized that “[p]ayments for patent infringement to non-practicing entities raise troubling issues when the patents cover a small element of a product or process and when network effects, economies of scale and switching costs are more important than patents as sources of product value”²⁹ He notes that “failing to recognize that an infringed patent is but one of many sources of product value” is an “egregious error” in patent enforcement, which is particularly important for complex technologies such as computer software, semiconductors and information technology.³⁰

Thus, having proper incentives for innovation necessarily means that no one or few patentees can receive excessive rewards, because this harms co-patentees and so effectively reduces the incentives for innovation. Many leading scholars believe that the patent system systematically over-rewards patentees and that the problem of overcompensation is growing of late.³¹ As explained by Lemley and Melamed,

In principle, patent damages could take account of the multiplicity of technologies in a product and allocate value among them accordingly, but that rarely happens [T]he intense focus in the trial on the patents-in-suit almost guarantees that their importance will be exaggerated . . . and, thus, that the damages award will be based on an inflated sense of the value of the patents-in-suit.³²

²⁹ Gilbert, *supra* note 11, at 7.

³⁰ *Id.* at 9.

³¹ See Carl Shapiro, *Patent Reform: Aligning Reward and Contribution* (NBER Working Paper No. 13141, May 2007), available at <http://www.nber.org/papers/w13141> (“The current U.S. patent system allows patent holders to capture private rewards that *exceed* their social contributions, [which] raise the deadweight loss [of] the patent system and discourage innovation by others.”).

³² Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117, 2144 (2013).

The rationale for over-rewarding patentees is based on the notion that the greater the rewards to patentees, the greater the incentives for innovation, and, therefore, the more innovation will occur. While that may be true up to a point, beyond that point—and in many cases, damage awards far exceed it—policies and practices that generate excessive rewards to some patentees harm the many other co-patentees (without whose complementary technologies there would be no products of the kind in question), because they fail to fully account for and proportionally reward the contributions of co-patents—because rents that would optimally accrue to the co-patentees instead are appropriated by one or a few patent holders. When the patent enforcement system fails to consider the negative externalities—that is, the harms—that are imposed on co-patentees by the assertion efforts of a few patent holders, that failure does not increase incentives for innovation—it reduces them.³³ Excessive returns to PAEs or other patent holders thereby discourage and hamper innovation.

C. *Patent thickets and royalty stacking*

Royalty stacking arises when a product potentially reads on a large number of patents held by many patentees,³⁴ especially when a substantial number of those patents are standard essential.³⁵ Problems

³³ The harm is compounded by the fact that, the more co-patents in a product, the greater the likelihood that many of those patents are merely incremental, that is, they do not represent substantial advances in technology.

³⁴ As a physical analogy, compare the case of a railroad, R , building a railway from A to B facing scenario (1) in which there is only a single landowner L and can therefore buy the right of way from L and scenario (2) in which R has to negotiate with a large number of landowners ($L1, L2, \dots Ln$) along the potential route. In the first case, L has an interest in accepting a “fair” share of the economic value created by the right of way and the operating railroad; in the second case, each landowner Ln has an economic incentive to hold up R for a disproportionate share of the economic value produced by complementary inputs. In rights of way involving real property, this problem is solved by public rights of eminent domain, which, unfortunately, do not apply to royalty stacks, even though they can cause the same kind of dead-weight loss of consumer welfare.

³⁵ Note that undeclared, but effectively standards-essential patents can be even more problematic. Suppose that a standard setting organization (SSO) requires contributors of patented technologies to its standard to accept

of hold-up involving royalty stacking are exacerbated when there are a large number of patentees, thereby increasing the severity of the Cournot complements problem.³⁶ Moreover, royalty *meta-stacking* arises when a product has many components and functionalities that read on *multiple* standards and many non-standards-based patents, such as a smartphone that utilizes at least thirty different standards (by some counts a multiple of that), for wireless communications, video display, and Internet access. Even before the increased royalty stacks embodied in today's smartphones, Thelander estimated that, in the early 2000's, mobile phone royalties may have run as high as 22.5% for WCDMA technology, plus 15%–20% for GSM technology if the phone is dual band.³⁷

Unfortunately, the potential economic rents from patent hold ups are elevated by liberal patent-granting policies and high litigation costs. As noted by Burk & Lemley,³⁸ the U.S. Patent and Trademark

FRAND royalties if the SSO designates these patents to be standard essential. Imagine further that the holder of a patented technology fails to disclose its ownership status but allows (or even encourages) the SSO to treat the technology as essential to practicing the standard. Because it did not contribute its technology to the standard, it would not, under these assumptions, be subject to the FRAND obligation even if its technology were ultimately adopted as a standard-essential patent. And because it failed to disclose the proprietary nature of its technology, the SSO may adopt the technology under the assumption that it is in the public domain (and so associated with no royalty obligations). Under these circumstances the patent holder could disclose its rights after its technology has been adopted by the SSO, and after makers of standards-compliant products have sunk considerable sums into investments that are specific to this technology, causing these PEs to be locked in to that technology. This would allow the patent holder to demand, and receive, royalty rates considerably in excess of FRAND rates. The opportunity to gain in this way could lead the patentee to opportunistically fail to disclose its patent holdings *ex ante*.

³⁶ For a definition of Cournot complements, *see supra* section II.A.

³⁷ These estimates include only the royalties to companies who have identified essential patents; they exclude expected payments to important patent-holders such as AT&T. Michael W. Thelander, *The IPR Shell Game*, SIGNALS AHEAD, June 6, 2005, at 6–7, available at <http://www.signalsresearch.com/Links/Signals%20Ahead%200606.pdf>.

³⁸ DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* (2009).

Office (USPTO) has a systematic bias toward granting patents, leading to “higher” stacks that often include invalid and weak patents and overly broad claims.³⁹ This pro-patent bias is most pronounced for software patents, many of which could not have passed “novelty” or “prior art” tests had the USPTO conducted thorough searches. Because software patents were relatively new in the 1990s, the USPTO focus on searching prior patents—and the lack of standard terms in describing software—led to far too many software patents being granted. Recent jurisprudence has compounded the problem of excessive granting of software patents by overly broad claim construction,⁴⁰ enabling earlier-generation software patents to be used against current generation software. Even though these artificially inflated patent stacks generate little or no additional economic value, they nevertheless increase the opportunities and incentives for hold up.

The larger the stack, the smaller the contribution of any patent (or patents-in-suit) to the market value of a product, yet damages awards seldom reflect that basic economic principle.⁴¹ Although most patent litigation does not go to trial, overly broad claims and excessive damage awards, along with the threat of injunction, greatly increase the hold-up

³⁹ While patents that, if challenged, would be found invalid make no contribution to innovation, they nonetheless can have substantial hold-up values due to high litigation costs and the financial risks of uncertain litigation outcomes.

⁴⁰ See Kevin E. Collins, *Patent Law's Functionality Malfunction and Its Implications for the Problem of Software Patent Overbreadth*, 90 WASH. U. L. REV. 1399 (2013) (“Software patents are routinely overbroad. Compared to patents on other fields of endeavor, software patents routinely grant inventors claims that reach further beyond the technology that an inventor has actually invented and disclosed . . .”). See also ROBIN FELDMAN, *RETHINKING PATENT LAW* 104–35 (2012); and Mark Lemley, *Software Patents and the Return of Functional Claiming* 2–4 (Stanford Public Law Working Paper No. 2117302, Oct. 2012), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2117302.

⁴¹ See Lemley & Shapiro, *supra* note 16, at 2036 (“Fact finders do . . . grant somewhat lower royalty rates for component inventions[,] . . . approximately 10.0% compared with . . . 14.7% for integrated product claims, [which] is equivalent to a conclusion that there are on average less than 1.5 components in multi-component inventions. Obviously this does not reflect commercial reality . . .”).

value of invalid or weak patents. When settlement agreements or damages verdicts include running royalties on a per unit basis ($X\%$ or $\$Y$ per unit), the marginal costs of production of firms that make the products that are found to be infringing are increased, amounting to a tax on those units. Tax incidence theory tells us that some fraction of those costs will be shifted to consumers. Unless and until patent royalties—or patent damages and settlements—take full account of the relatively small contribution of any given patent (or small subset of patents) to the economic value of a patent-thick product, there will be excessive returns to those patentees who most aggressively prosecute their patents, exploiting royalty stacking by committing patent hold up.⁴²

For these reasons, Love argues that “[i]n its current form, the entire market value rule⁴³ . . . exacerbates the effects of ‘royalty stacking’ [when] a complex product . . . may be covered by a number of patents owned by an equally large number of patentees. As a result, the producer . . . may be required to pay for multiple licenses. To the extent that patent damages rules allow for the overcompensation of patentees, the infringer faces the prospect of paying overlapping royalties. Royalty stacking in the entire market value rule context can be particularly egregious.”⁴⁴

Furthermore, the potential for an injunction against the whole product enables patentees to hold up defendants by threatening to enjoin products that are predominantly noninfringing. Under the threat of excessive damages awards, patentees can earn economic rents by “merely” threatening to sue, and then offering to settle for less than the target’s litigation costs, even though that settlement value may substantially exceed the economic value of patents.⁴⁵

⁴² In some cases, overcompensation to the patents-in-suit may not cause overcompensation to the patentee, such as when the patentee holds a sizeable portfolio of related patents that were, for whatever reason, excluded from the litigation.

⁴³ See Love, *supra* note 28, at 265 (“The entire market value rule allows for recovery of patent infringement damages on the value of the entire product, rather than on the value of the infringing component alone . . .”).

⁴⁴ *Id.* at 280.

⁴⁵ Note also that challenging asserted patents through a litigated outcome can generate positive externalities. If patents are found invalid after being asserted against any one defendant, those patents have a much

III. FUNDAMENTAL DIFFERENCES IN STRATEGIC POSITIONS AND ECONOMIC INTERESTS OF PES & PAES

A. *Strategic position and interests of practicing entities*

PEs can earn returns on their innovation investments by selling products that practice their patents. Moreover, given the dynamic feedback loop between invention and innovation, PEs have an interest in using the knowledge gained at one stage of the development cycle to innovate at subsequent stages. For example, R&D in the product, combined with knowledge gained in making the product, creates opportunities and incentives for downstream innovation, increasing the manufacturability, reducing the costs, and improving the quality of the product.

While any given PE has an interest in earning returns to its R&D and resulting patent portfolio, it must balance that interest against its often greater interest in growing the market for its products, even if that means taking a smaller slice of a larger pie. This is especially true for products that face the potential for royalty stacking, involving many co-patentees, in which many small royalties add up to a significant total royalty burden. Therefore, PEs have an interest in moderating their royalty claims against the types of products they sell, for two reasons. First, if the co-patentees can obtain cross-commitments from other co-patentees of a class of products, such as cross licenses, the total royalty cost can be reduced, leading to lower prices to customers and an expanded market for those products. Second, when PEs can earn profits on the products they sell, they will rationally trade off higher royalties for larger unit sales. PAEs face no such tradeoff, and therefore each has an incentive to charge higher royalties, which when stacked across many co-patentees, would cause market prices for downstream products to rise, and so the quantity demanded for downstream products to fall, to the detriment of downstream producers and their customers.

lower value in targeting others. Absent collective arrangements (such as joint defense agreements or litigation cost-sharing assistance from industry associations), a rational defendant will not incorporate those externalities into its decision to settle or litigate. Such defendants would therefore have socially suboptimal incentives to litigate, and so excessive incentives to settle.

In addition, royalty and licensing demands of PEs are also moderated by reputation effects. PEs often have to conduct business with those to whom they license or cross-license their patents. Typically, PEs are engaged in “repeated games” with co-patentees and licensees, as suppliers, marketing partners, or by collaborating in SSOs and are therefore less likely to exploit opportunities for hold up in any one period.

PEs “share” their intellectual property by cross-licensing their respective patents to their competitors or contributing them to standards with FRAND commitments to create a mass market for devices, networks, and systems (by generating scale economies and large network effects to promote adoption). PEs often cross-license with other PEs at low royalties or on a royalty-free basis. Such cross-licenses mitigate or eliminate the royalty stacking problem and thereby avoid inflating the marginal costs and prices of their products. Such “no-or-low” royalty cross-licensing or pooling of PEs’ patents greatly expands the total size of the market for downstream products, as firms realize scale economies in production and product prices are not burdened with high royalties. Reducing market prices increases total sales, providing opportunities for further reductions in manufacturing costs and investments in R&D for continued innovation. As the total market grows, PEs have incentives to develop new variants of their products or to introduce new ones, increasing the ability of PEs to meet specific needs or demands of particular groups of consumers.

Cross-licenses among PEs are an effective way to deal with the excessive number of patents, uncertain coverage of the patents, and even the validity of patents. Any large patent portfolio typically includes strong and weak patents, valid and invalid patents, and infringed and noninfringed patents. In substantial cross-licenses, the law of averages works out, in that each party’s probabilistic portfolio includes patents that are invalid or weak, but also some that are valid and strong. PEs can build on their cross-licensed patents to earn higher profits by making further innovations to differentiate products, improve product quality, or improve production processes, without incentives to engage in costly and distracting litigation—including litigation associated with weak or potentially invalid patents—that can slow technological progress and harm consumers.

In short, the strategic interests of PEs generate strong incentives for innovation and for cooperation among co-innovators. In a world of patent-thick products and systems, such cooperation is critical to successful innovation.

B. Strategic position and interests of PAES

In contrast, PAEs earn no revenues or profits from making or selling products—only from charging royalties to those who do. The primary or even sole interest of many PAEs is rent seeking, often achieved through patent hold ups. Because PAEs do not practice their own or others' patents, there is no basis for gains from trade from cross-licensing on any basis—much less at no-or-low royalties. PAEs only seek monetary awards, which raise the costs and prices of affected products. By definition, PAEs need have no fear of defense or retaliation in the form of counterclaims alleging infringement of their target's patents, so there is no way to prevent them from committing hold ups: *détente* is not workable.⁴⁶

Under threat of litigation, PAEs can cause alleged infringers to settle, even though the patents or their claims are not disclosed, are not valid, or are not infringed, simply because the cost of litigating even unmeritorious claims⁴⁷ can substantially exceed the PAE's settlement demands. Moreover, the transaction costs of litigation are highly asymmetric between PEs and PAEs. First, the PE has committed employees and resources to develop and produce its products, while the PAE has no product-specific investments at risk. Second, PAEs often are specialized litigation machines that are more efficient and proficient users of the legal process than are many PEs (who specialize in making products, not lawsuits). That asymmetry increases the incentive for PAE targets to settle for an amount that is greater than the economic value of the patent(s) but less than the cost of litigating.

⁴⁶ Arguably, PAEs should, in some instances, be at risk of counterclaims of patent abuse or antitrust violations.

⁴⁷ Sara Jeruss, Robin Cooper Feldman & Joshua Walker, *The America Invents Act 500: Effects of Patent Monetization Entities on U.S. Litigation*, 11 DUKE L. & TECH. REV. 357, 370 (2012) ("The data also show that cases filed by patent monetizers were unlikely to advance very far in the trial process and often settled prior to a summary judgment decision.").

The gains from such hold-up settlements can then be used by the PAE to “encourage” others to settle at levels that far exceed the actual economic value of the patents being asserted.

The threat of injunction further increases hold-up value and settlements; the more patents in the thicket, the greater the economic rents compared to the returns to innovation. Any payment to a PAE above the actual economic value of its patents constitutes a tax on consumers, a tax on innovation, or both. Even though the sum of the royalties (plus damages) sought by PAEs may exceed the “carrying capacity” of a particular class of products, causing great harm to innovators and consumers, no individual PAE has an interest or incentive in moderating its claims. Therefore, PAEs are effectively exploiting the commons of patent-thick products that have been created by collective innovations made largely by PEs.

Because PAEs do not produce products, there is no potential for cross-licenses between PEs and PAEs, exacerbating the problems related to invalid or weak patents. Unless PAE targets are willing to bear the substantial costs of litigating, the hold-up value of invalid or weak patents can be substantial. Furthermore, while there are significant positive reputational effects moderating the conduct of PEs, they do not restrain PAE behavior, because (1) PAEs’ single-minded objective is maximizing the hold-up value of their patents; and (2) PAEs do not conduct other business with their target companies. Indeed, there may be significant hold-up value to generating a negative reputation: Being known as the “baddest and most aggressive” PAE can increase the likelihood of early settlements reducing a PAE’s litigation costs and decreasing the chance that its patents will be found invalid, not infringed, or of little economic value in litigation.

IV. ASSERTION ACTIVITIES OF PAES

A. *PAES exploit deficiencies in the patent system*

PAEs and their defenders often argue that they perform a valuable role in promoting innovation by creating a secondary market for patents and rewarding inventors. PAEs claim that they “identify undervalued patents and invest time and effort marketing those

patents to other firms . . . a simple case of arbitrage.”⁴⁸ If most patents were actually valid and claims clearly disclosed real advances in innovation, perhaps such arbitrage would promote the public interest. If that is not the case, the argument that PAEs promote innovation by facilitating invention misses the mark.

The exploitation of deficiencies in the patent system is being further compounded by the dramatic growth in secondary markets for patents. Secondary markets often increase the realization of the economic value of traded assets—and to some degree patent markets (in which PAEs take the role of resellers) may do that. However, Matt Levy makes a strong case for the proposition that it is the *malfunctioning*—not the functioning—of patent markets that drives patents’ values in secondary markets. His conclusion is based on the fundamental flaws in the U.S. patent system:

If patents were clear and easy to understand, then only those patents that were being used commercially would have monetary value. That’s a tiny fraction of issued patents. But most patents aren’t clear. They’re extremely difficult to interpret, and it costs thousands of dollars just to get a lawyer’s opinion on what a patent covers. The only way to have a definite answer with respect to what a patent means is to spend millions of dollars on litigation.⁴⁹

Thus, in many cases, secondary markets facilitate rent seeking based on the hold-up value of traded patents, not their economic value—as would be measured by their incremental contribution to innovation. According to Love, “NPEs are especially litigious, overwhelmingly assert high-tech patents, and lose at a relatively high rate when their infringement claims are adjudicated on the merits.”⁵⁰ For those reasons, Chien argues that “conventional notions of patent value

⁴⁸ Miranda Jones, Case Note, *Permanent Injunction, A Remedy by Any Other Name Is Patently Not the Same: How eBay v. MercExchange Affects the Patent Right of Non-Practicing Entities*, 14 GEO. MASON L. REV. 1035 (2006).

⁴⁹ Matt Levy, *Dear Intellectual Ventures, Part I: Your Patents Are Worth a Lot Because No One Knows What They Mean*, PATENT PROGRESS, May 21, 2013, available at <http://www.patentprogress.org/2013/05/21/dear-intellectual-ventures-part-i-your-patents-are-worth-a-lot-because-no-one-knows-what-they-mean/>.

⁵⁰ Love, *supra* note 28, at 1313.

need to be revised. The same patent has a much greater ‘exclusion value’—which I define as the value likely to be extracted from the patent—when held by a patent-assertion entity rather than a company vulnerable to countersuit.”⁵¹ Thus, Feldman and Ewing argue that

the same market imperfections that fuel the trolling phenomenon are likely to prevent the market for patent monetization from offering the positive effects contemplated and to create harm instead The patent system is plagued by a vast supply of patents, many of which may be quite weak In addition, regardless of whether the patent is weak or strong, the range of each patent cannot be determined without a large investment of time and effort”⁵²

Thus, PAEs do not merely exploit flaws in the patent system, they compound the harm caused by those flaws. As noted, two of the most important driving forces of increased patent assertion are the large and asymmetric costs of patent litigation and excessive damage awards due to the apportionment failure. The secondary market for patents and dramatic increase in the number of PAEs has contributed mightily to an increase in the number of assertion entities. As patent portfolios are disaggregated—for whatever reason—there is a disproportional increase in the number of potential hold ups and excessive damage awards. For that reason, I concur with Lemley and Melamed that “many of the problems associated with trolls are in fact problems that stem from the disaggregation of complementary patents . . . into too many different hands.”⁵³

Moreover, Fischer and Henkel emphasize that several aspects of the current patent enforcement system are biased in favor of PAEs, including: (1) “The patent system and its implementation induce infringement by allowing patents on trivial or not novel inventions,”

⁵¹ The author also argues that “if stockpiles of unused patents patent continue to fall into the hands of patent-assertion entities, defensive patenting may ironically have the net effect of increasing, rather than decreasing, litigation risk.” Colleen V. Chien, *Of Trolls, Davids, Goliaths, and Kings: Narratives and Evidence in the Litigation of High-Tech Patents*, 87 N.C. L. REV. 1571, 1578 (2009).

⁵² Robin Feldman & Tom Ewing, *The Giants Among Us*, 2012 STAN. TECH. & L. REV. 52 (2012).

⁵³ Lemley & Melamed, *supra* note 32, at 2121.

which leads to patent infringements on inventions that engineers do not even think of checking for patent clearance; (2) “Patents may not be clearly delineated, in which case it is difficult to decide if a patent reads on a product or not,” which leads to infringement even when the infringer is unaware of the patent; and (3) “The more burdensome patent clearance, the more likely it is that some relevant patent slips an innovator’s attention. This problem is particularly prevalent in complex product technologies.”⁵⁴

If granting too many patents weren’t bad enough, these problems are compounded by a standard of legal review that presumes the validity of patents—notwithstanding the abundant evidence that many are not. PAEs have strong incentives and many opportunities to exploit that bias in the enforcement of patents. As Lichtman and Lemley conclude:

[T]he presumption of validity backfires. Rather than protecting accurate initial decisions from inefficient later meddling, the presumption precludes what would often be a worthwhile second look. As a result, courts today regularly enforce overbroad and undeserved patents, and strategic applicants continue to apply for undeserved patents knowing that there is a good chance the [USPTO] will err.”⁵⁵

B. *The role of PAES in patent enforcement*

A number of recent empirical studies of patent assertion and enforcement activities have concluded that the role of PAEs has been growing rapidly and that PAEs now represent a substantial share of all patent assertions. Allison, Lemley and Walker found that “[n]on-practicing entities are clearly an important phenomenon in the modern patent system. While they account for only about 16% of the once-litigated patents, they represent over 80% of the suits filed involving the most-litigated patents, and own more than 50% of the most-litigated patents themselves.”⁵⁶ Their study compared the 106

⁵⁴ Fischer & Henkel, *supra* note 14, at 4.

⁵⁵ Douglas Lichtman & Mark Lemley, *Rethinking Patent Law’s Presumption of Validity*, 60 STAN. L. REV. 45 (2007).

⁵⁶ John R. Allison, Mark A. Lemley & Joshua H. Walker, *Extreme Value or Trolls on Top? The Characteristics of the Most Litigated Patents*, 158 U. PA. L. REV. 31 (2009).

most frequently litigated patents to a control group of once-litigated patents: “The results are startling. The most-litigated patents are far more likely to be software and telecommunications patents, not mechanical or other types of patents. They are significantly different from once-litigated patents in ways that signal their value up front. And they are disproportionately owned by non-practicing entities (i.e., ‘trolls’).”⁵⁷ Recent “[e]mpirical evidence suggests that the most-litigated patents, which are responsible for more than 10% of all patent assertions, are overwhelmingly software patents and that cases involving [those] patents are (1) overwhelmingly filed by patent trolls and (2) overwhelmingly unsuccessful when litigated to judgment.”⁵⁸

Cheng, Lan and Liu emphasize that the effect of nonpracticing entities on patent market dynamics depends critically on the specific features of those entities.⁵⁹ They argue that nonpracticing entities with R&D capabilities can “integrate knowledge from both the innovation market and the product market,”⁶⁰ can more easily monetize their intellectual property through licensing, and are thus more likely to interact with PEs through cooperative licensing and assignment, rather than litigation. Conversely, the authors argue that nonpracticing entities without R&D capabilities are much more likely to engage in “legal wars” with PEs. Thus, it is important to distinguish PAEs from other nonpracticing entities in assessing the costs and benefits of patent holding and assertion.

In a study comparing patent suits over an eight-year period, Professor Chien found that “[c]ounting suits based on the number of defendants and including [declaratory judgment] cases, the [nonprac-

⁵⁷ *Id.* at 3 (using data on patent suits filed between 2000 and 2007 from the Stanford IP Clearinghouse).

⁵⁸ Lemley & Melamed, *supra* note 32, at 2123 (footnotes omitted).

⁵⁹ Yu-Chao Cheng, Yuhong Lan & Shang-Jyh Liu, *Patent Market Dynamics In View of the Business Models of Non-Practicing Entities* (ETM/IEL Working Paper 31 Apr. 2012).

⁶⁰ *Id.* at 1. For this to be true, the size of the R&D expenditures by the nonpracticing entity would have to be significant relative to the size of portfolio held by the PAE. Otherwise, it is unlikely that the PAE’s interest in R&D and further innovation would override its interest in rent seeking through assertion of the patents.

ticing entity] share rises to 28% of all high-tech patent suits. This average reflects an increase in [nonpracticing entity] suits as a proportion of all suits over an eight-year period, from 22% in 2000–2001 to 36% in 2006 to March 2008, counting defendants, or from 10% to 20%, counting cases.”⁶¹ A subsequent paper by Professor Chien found that “although large companies tend to dominate patent headlines, most unique defendants to troll suits are small. Companies with less than \$100M annual revenue represent at least 66% of unique defendants and the majority of them make much less than that: at least 55% of unique defendants in PAE suits make under \$10M per year.”⁶²

An initial study (based on a sample of patent litigations) by Jeruss, Feldman and Walker found that “lawsuits filed by monetizers increased from 22% of the cases, filed in the first year of the study, to almost 40% of the cases filed in the latest year.”⁶³ This research has subsequently been expanded to include 100% of patent litigations over a four-year period, on the basis of which the authors conclude:

Patent infringement litigation by patent monetization entities has risen dramatically over a remarkably short period of time. One of the most striking results is the following: *in 2012, litigation by patent monetization entities now represents a majority of the patent litigation filed in the United States.* Specifically, patent monetization entities filed 58.7% of the patent lawsuits in 2012. This is a sharp rise from 2007, when patent monetization entities filed only 24.6% of patent infringement litigations Of the 10 parties who filed the greatest number of patent litigations in the years we studied, all were patent monetization entities.”⁶⁴

These findings are consistent with a recent study by Patent Freedom, which in its most recent report on nonpracticing entities found

⁶¹ Chien, *supra* note 51, at 1571.

⁶² Colleen Chien, *Startups and Patent Trolls* (Santa Clara Univ. Legal Studies Research Paper 09-12 2-3 2012).

⁶³ Jeruss, Feldman & Walker, *supra* note 47, at 363. Note that the authors make careful distinctions among “monetizing entities, individuals and trusts,” which have different motives, exhibit different characteristics and follow different practices in licensing or asserting their respective patent portfolios.

⁶⁴ *Id.* at 365. The authors coded all of the patent litigations filed in four years, 2007–08, and 2011–12, analyzing 13,000 cases and the 30,000 patents asserted in those cases.

that “[p]atent lawsuits involving nonpracticing entities have increased dramatically over the last decade. In 2011, another record setting year, there were more than 5,200 occasions when a company found itself in litigation with a nonpracticing entities, a number that has increased by an average of over 36% per year since 2004.”⁶⁵

C. Technological changes will increase patent density and economic rents from patent hold up

All signs point toward the continued integration of devices, with expanded features and functionality. The more components incorporated in a device, and the more features and functions of a device, the more patents it will implicate. These developments portend a growing number of patentees who can assert patents against the makers, sellers, or users of such a device, increasing the likelihood of opportunistic rent-seeking patent hold ups.

These trends will be compounded by the continued and increasing development of standards to facilitate or enable interconnection and interoperability, which will increase the number of standards embodied in these integrated devices. The problems associated with royalty stacking and metastacking will increase accordingly.

The continued rapid growth of wireless communication capabilities will ensure that more devices will be interconnected to other devices. Examples of such interconnection include that of smartphones to the mobile network; office PCs to servers, other PCs, and multifunction printer-copier-scanners; and mobile devices to payment systems. In addition to the royalty stacks embodied in each of the interconnected devices, there are many patents on the methods of connecting those devices and methods of using those connected systems.

A growing proportion of the capabilities of computing and communications devices is generated by software (for example, transforming a mobile phone into a smartphone requires an operating system; much of the functionality of a smartphone is generated by native apps or installed apps enabled by that operating system). As

⁶⁵ *All About NPEs: Litigation Over Time*, PATENT FREEDOM (Feb. 7, 2014), available at <https://www.patentfreedom.com/about-npes/litigations/> (last visited May 14, 2014).

noted above, software patents are especially problematic because of the failure of the USPTO to reject claims that represent prior art or are overly broad, but these problems only increase the gap between the economic value of a patent and its hold-up value.

In addition, many traditional products are being transformed by the addition of computing and communication capabilities, including autos, kitchen appliances, TVs, temperature control systems, and lighting systems. These products will, or already do, incorporate operating systems and applications software and will be connected to the Internet for diagnosis, monitoring, and control. These richer patent-thick targets portend more patent aggression against innovators, makers, sellers, and users of these products and systems.

D. Without reforms, PAE assertion, litigation, and economic harm will continue to grow dramatically

Finally, it is imperative that regulators and legislators realize that economic forces will, absent significant patent reforms and active antitrust enforcement, cause the incidence of PAE patent aggression to grow and the economic harm caused by PAEs to proliferate and accelerate. There are several technological forces that will cause the number of patent-thick products and systems to continue to grow, including: the integration of more features, functions, and components in devices; decreasing product life cycles requiring devices to operate on two or more generations of standards; the greater interconnection of more devices into patent-thick systems; the spread of “intelligence” to traditional products; and the growing importance of software applications and software patents. Moreover, institutional innovations by PAEs, feedback loops in the secondary market for patents, and the markets for corporate control are increasing the opportunities and the potential for earning economic rents by transferring and exploiting the hold-up value of patents. Thus, it is readily apparent that the dramatic spike in PAEs and their assertion activities is not a passing phase. To the contrary, in classical marketing terms, we have seen only the “takeoff” stage of the PAE product life cycle. If unabated by policy reforms and remedial action, PAEs—and the transfer of patents to PAEs—will cause even greater harm in the future.

The larger the share of patents in a portfolio that are implicated in one or more patent stacks, and the taller those stacks, the greater the opportunities for, and the economic rents that can be extracted from, hold-up by whomever controls those patents. The greater the hold-up value of a portfolio relative to its current use, the greater the pressure on the current owner to “put it in play” and maximize the returns through patent aggression or transfer it to a patent aggressor, typically a PAE, which is not “encumbered” by reputational concerns or contributing to the innovation commons.

The market for control of patents has an inherent positive feedback loop: The most aggressive bad practices of patent holders affect (and, at the limit, determine) the value of any given patent portfolio (or portion thereof). Thus, the rapidly developing secondary market for patents will accelerate the rate of change in control, with patents increasingly held by PAEs that are willing to exploit their hold-up value. The market for control will elevate the price of patent assets to reflect their most aggressive rent-seeking use, far above their socially optimal returns (which are defined by that level of reward needed to generate innovation). Changes in control can further increase economic rents if the transaction is used to abrogate commitments or obligations of the prior owner (such as licenses, cross-licenses, or FRAND commitments).⁶⁶

The developing market for patents incentivizes “good actors” to sell their patents or licensing rights to “bad actors.” Institutional “innovation” by PAEs that are successful in generating economic rents will be quickly copied, even though they harm innovation and consumer welfare. There has been a substantial expansion in financing available for PAEs, from private equity and venture capital firms, which are accustomed to high risk–high reward investments. Moreover, as large PEs fail, market pressure to sell or license their patent portfolios (their only or most valuable asset) will rise, for distribution to creditors and equity owners or to finance reorganization.⁶⁷ And, in many cases, the most valuable asset of failed or failing innovative

⁶⁶ Even if the attempt ultimately fails, it adds to the cost and risk of litigation by potential licensees, biasing them toward unfavorable settlements.

⁶⁷ Once the sale of a PE’s patent portfolio to a PAE occurs, there is a separation of the research and development which created the innovations and inventions underlying the patents, the use of those innovations to produce

startups is their patent portfolio, which, increasingly venture capital investors will put on the market to realize some return on their investments. Once in the hands of a PAE, rather than an entity with a long-term interest in making and selling products, returns on patents are driven by short-term financial considerations rather than long-term innovation and success in the marketplace.

V. TYPES OF ECONOMIC HARM CAUSED BY PAES

A. *PAEs seek injunctions that harm co-patentees & innovation*

The potential for an injunction against the whole product can and does permit patentees to hold up defendants by threatening to enjoin a product even if the product is predominantly noninfringing. Although the U.S. courts⁶⁸ and the International Trade Commission are supposed to take account of “the public interest” in deciding whether to enjoin a product that has been found to infringe, those decisions typically give little or no weight to the potential harm to co-patentees and the public interest in not allowing some patentees to extract the economic value that should be attributed to co-patentees.

When an injunction is granted to one patentee of a patent-thick product, co-patentees can be harmed due to: (1) loss of licensing royalties that would have been earned from sale of the now-enjoined product; (2) the loss of sales of components used in the enjoined product (which typically include co-patents); and (3) the general harm of increased risk and uncertainty in the industry affected by the injunction (which is substantially greater if industry standards are involved).

Failure to incorporate these public interest effects on co-patentees increases the likelihood—and therefore the “threat value”—of injunc-

goods or services, and the use of the patents for assertion activities. Thus, the positive feedback loop of “learning by doing”—an important stimulus to innovation—is broken.

⁶⁸ In *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006), the Supreme Court unanimously determined that an injunction should not automatically issue based on a finding of patent infringement. Instead, a federal court must still weigh the four factors traditionally used to determine if an injunction should issue.

tions; both courts and the International Trade Commission should be encouraged (perhaps even required) to take account of the harm injunctions cause to co-patentees and the reduced incentives for innovation. Moreover, the “mere” threat of injunction can easily enable a patentee to extract settlement payments far exceeding the amount that the patentee could expect to earn in damages based on reasonable royalties (that is, the hold-up value), which harms co-inventors and consumers and reduces the incentives for innovation in the industry.

B. PAEs seek unreasonable royalties that harm co-patentees & innovation

In addition to the threat of injunction, typical damages awards based on “reasonable royalties” often far exceed the relative contribution of the few patents-in-suit to the total value of the product. The “thicker” the thicket, the smaller the contribution of any patent to the entire market value of the product, yet damage awards do not reflect that fundamental economic principle.⁶⁹ Although the worst excesses have been somewhat moderated by recent court decisions,⁷⁰ the continued use of the entire market value rule systematically generates excessive royalties and over-compensation to patentees. As Brian Love describes:

When the [entire market value] doctrine is applied but the patent at issue accounts for less than this entire value, patentees are awarded for value they did not create . . . This overcompensation results in socially undesirable consequences such as reduced incentives for investment in beneficial technology, increased risk of royalty stacking, and increased incentive for patent trolling . . . [yet] the Federal Circuit nonetheless routinely affirms damages awards granted under the doctrine despite clear evidence that unpatented components have independent value or that reasonable alternatives exist for the patented invention.⁷¹

⁶⁹ See *supra* note 41.

⁷⁰ “Over the last year, and as recently as this March, a pattern of cases [citing, *inter alia*, *Cornell v HP*, *Lucent v. Gateway/Microsoft*] has developed addressing the issue of damages apportionment in patent infringement litigation. The results seem to signal a stricter evidentiary standard for damages generally and the application of the Entire Market Value Rule in particular.” LAW360, New York (Apr. 12, 2010), <http://www.law360.com/articles/156938/signaling-a-stricter-damages-standard-in-fed-circ->.

⁷¹ Love, *supra* note 28, at 272.

Unfortunately, these upward biases in reasonable royalties in cases involving patent-thick products have been further compounded by courts, which deliberately increase damage awards to patentees as a “deterrent against infringing.”⁷² Landers argues that “reasonable royalty awards have delivered inexplicably harsh results in a system in which the infringer may be liable for an amount disproportionate to the harm caused.”⁷³ She cites instances in which the awarded royalty rates exceed the infringing product’s selling price. These practices demonstrate that the patent system does not carefully balance the rights of patent holders against those of other patent holders or subsequent improvers. Rather, “the patent system has granted the biggest wins to nonpracticing entities, who inexplicably obtain jury awards that average three times those of patentees who practice their inventions.”⁷⁴

Love concurs that “[w]hen courts award infringement damages that are greater than the intrinsic value of the litigated patents, they send the message to patent owners that aggressive enforcement of their patent rights will be more profitable than using those inventions to bring products to market.”⁷⁵ Patent valuation methods that emphasize quantity over quality (such as numeric proportionality methods) exacerbate the problem of excessive rewards to patentees, which is further compounded by the proliferation of poor quality patents.

C. *Unreasonable settlements with PAEs harm co-patentees & innovation*

The threat of injunction and the likelihood of excessive rewards can generate settlements that exceed the economic contribution of the patentee to patent-thick products, which amounts to a tax on the innovations of co-patentees. The high cost of defending patent litigation further compounds the problem, because defendants find it economically rational to settle for amounts that far exceed the true

⁷² Brian J. Love, *Misuse of Reasonable Royalties as a Patent Infringement Deterrent*, 75 MO. L. REV. 909 (2009).

⁷³ Amy L. Landers, *Patent Claim Apportionment, Patentee Injury and Sequential Invention*, 19 GEO. MASON L. REV. 471 (2012).

⁷⁴ *Id.* at 4.

⁷⁵ Love, *supra* note 28, at 280–81.

economic value of the patents-in-suit, rather than face extraordinary litigation costs and the uncertainty of an excessive damage award.⁷⁶ One study has found that “[t]he average defense costs are \$1.6 million through discovery and \$2.8 million through trial in which \$1 million to \$25 million is at stake.”⁷⁷ And Goldberg notes: “Beyond its expense, discovery can be invasive for defendants, requiring companies to disclose their trade secrets and other confidential technical and financial information, as well as distracting personnel from their business pursuits.”⁷⁸ Thus, small and medium-sized companies may face a Hobson’s choice because they cannot afford the defense costs.⁷⁹ Studies have shown that fifty-five percent of the companies PAEs target have \$10 million or less in revenue,⁸⁰ and eighty-two percent have revenues of less than \$100 million.⁸¹ Unfortunately, the litigation cost function is highly asymmetric between PAEs and their targets: Whereas the high costs of litigation often causes targets to settle, PAEs have adopted

⁷⁶ The systemic flaws in patent damage awards enable and incentivize PAEs to commit patent hold up even when their portfolios include many invalid or weak patents: Ninety-two percent of PAE’s lose on merit judgments. John R. Allison, Mark A. Lemley & Joshua Walker, *Patent Quality and Settlements among Repeat Patent Litigants*, 99 GEO. L.J. 677, 694 (2011).

⁷⁷ AM. INTELLECTUAL PROP. LAW ASS’N, REPORT OF THE ECONOMIC SURVEY (2012), available at <http://www.aipla.org/learningcenter/library/books/econsurvey/2011/Pages/default.aspx>.

⁷⁸ Goldberg, *supra* note 10, at 4.

⁷⁹ See Colleen V. Chien & Edward Reines, *Why Technology Customers Are Being Sued En Masse for Patent Infringement & What Can Be Done* 5 (Santa Clara Univ. Sch. of Law Working Paper No. 20-13, Aug. 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2318666 (“The burden for these suits falls disproportionately on small companies, and too often results in nuisance settlements based on the high cost of defending a patent case, not the merits of the claim.”).

⁸⁰ Nick Grossman, *The Patent Quality Improvement Act*, UNION-SQUARE VENTURES, May 9, 2013, <http://www.usv.com/2013/05/the-patent-quality-improvement-act.php>.

⁸¹ Ingrid Lunden, *Senator Charles Schumer Targets Patent Trolls, Wants USPTO to Review Infringement Suits Before They Head to Court*, TECHCRUNCH, May 1, 2013, <http://techcrunch.com/2013/05/01/senator-charles-schumer-plans-bill-for-uspto-to-review-patent-troll-suits-before-they-head-to-court/>.

assertion practices that greatly reduce their total expected litigation costs (especially if alleged infringers sue rather than fight). A case against the customers of Cisco Systems provided a glimpse into a PAE litigation model. In that case, the PAE sent out more than 8000 demand letters to potential defendants. Many targets agreed to prelitigation settlements, and the PAE filed only twenty-six cases.⁸²

PAEs often benefit from forcing alleged infringers to settle without actually filing litigation, or at least without a trial on the merits, because the quality of their patents is not subjected to scrutiny. Put simply, an untested patent is worth far more than a patent found to be invalid or not infringed. Statistics explain why PAEs typically want to avoid litigation. Once a case is filed, PAEs receive an award only twenty-three percent of the time. When cases go to trial that number goes down to a mere eight percent, compared with a forty percent win rate in traditional patent cases.⁸³

Unfortunately, challenges to issued patents are public goods, so they will be undersupplied “because the benefits of patent challenges, but not patent licenses, spill over to others; accused infringers’ reluctance to fight back reduces social welfare and increases opportunities for holdup by artificially extending the life of weak and abused patents.”⁸⁴ Settlements generate additional negative externalities and harm co-patentees because publicizing the settlements can be used to intimidate and hold up similar alleged infringers (and are also often cited in arguing for excessive royalties in litigation).

These distortions have been and will continue to be further compounded as excess returns to patents increase the market value of patents and the incentives for spinning off patent assets; this cycle increases the likelihood that the “market for control” will pressure owners to spin off assets to the worst possible buyers (unless a “good buyer” is willing to pay slightly more than a “bad buyer” would pay). Evidence indicates that PAE assertions dramatically increase near the end of their patents’ terms. Love examined data on patent enforce-

⁸² Cisco Sys. Inc. v. Innovatio IP Ventures LLC, Case No. 1:11cv09309 (N.D. Ill. filed Dec. 28, 2011).

⁸³ Allison, Lemley & Walker, *supra* note 76, at 694.

⁸⁴ Love, *supra* note 72, at 943 n.131.

ment undertaken prior to expiration for a random sample of recently expired patents to determine the relative timing of suits filed by PAEs compared to PEs. On average, patents owned by PAEs changed hands twice over a twelve-year span before they were first asserted, so the

final few years of the patent term overwhelmingly benefit patent trolls asserting grossly outdated patents The degree to which [nonpracticing entities] dominate the final few years of the patent term is especially shocking. Though asserting just over twenty percent of all studied patents, [nonpracticing entities] account for more than two-thirds of suits and over eighty percent of patent claims litigated in the final three years of the patent term.⁸⁵

Love thus concludes that the costs of PAE litigation outweigh its benefits and casts serious doubt on the claims by PAEs and their advocates “that paper patentees help create a market for innovation and contribute to the dissemination of useful technology.”⁸⁶ Rather, the evidence shows, PAEs typically wait to “assert their rights until the underlying technology is stale and unlikely to be of much use to accused infringers, who very likely independently developed the technology years earlier”⁸⁷

Given these patterns of patent assertion—attacking downstream customers, startups, small and medium-sized businesses, and exploiting patents very late in their term—it is not surprising that estimates of the economic harm caused by PAEs are quite large.

D. Estimates of economic harm caused by PAEs

For a number of reasons, it is difficult to measure the aggregate harm that has been caused by PAEs on innovation and economic performance. Estimating future harm is even more difficult; unfortunately, given the dramatic increases in PAE assertions and litigations, and the technological trajectory that ensures increasingly target-rich

⁸⁵ Love, *supra* note 12, at 1309. See also *id.* at 1312 (“Notably, [nonpracticing entities’] domination of late-term litigation is almost completely attributable to firms that do nothing more than hold patents. [Nonpracticing entities] that many do not consider trolls—universities and individual inventors, in particular—do not drive the results.”).

⁸⁶ *Id.* at 1312.

⁸⁷ *Id.* at 1317.

patent thickets, those harms will surely grow if patent and other public policies do not change.

By examining stock price behavior around the filing of the patent suits, Bessen, Meurer and Ford estimated that “[nonpracticing entity] lawsuits are associated with half a trillion dollars of lost wealth to defendants from 1990 through 2010” and that “[d]uring the last four years the lost wealth has averaged over \$80 billion per year.” Further, they found that “very little of this loss of wealth represents a transfer to inventors. This suggests that the loss of incentives to the defendant firms is not matched by an increase in incentives to other inventors.”⁸⁸ In a subsequent study, Bessen and Meurer found that

[t]he direct costs of [nonpracticing entity] patent assertions are substantial, totaling about \$29 billion accrued in 2011. This figure does not include indirect costs to the defendant’s business such as diversion of resources, delays in new products, and loss of market share. Even so, the direct costs are large relative to total business spending on R&D, which totaled \$247 billion in 2009 Much of this burden falls on small and medium-sized companies who make up 90% of the companies sued The median revenue of companies sued by [nonpracticing entities] is \$10.8 million.”⁸⁹

Tucker’s case study of the effects of patent litigation of medical imaging technology supports the proposition that PAE litigation causes harm to innovation. She notes that “the manner in which [PAEs] enforce their property rights—lengthy litigation proceedings—may itself harm technology diffusion.”⁹⁰ She emphasizes the asymmetry in the costs of litigation for PAEs and firms that actually produce products and services. Whereas PAEs are in the “litigation business,” PEs are not. So, whereas litigation does not interfere with the business of PAEs—that is, litigation—the expense and diverted attention of managers and engineers can negatively affect continuing innovation by the targets of PAEs.⁹¹

⁸⁸ Bessen, Meurer & Ford, *supra* note 13, at 2.

⁸⁹ Bessen & Meurer, *supra* note 2, at 42.

⁹⁰ Catherine Tucker, *Patent Trolls and Technology Diffusion* 4–5 (TILEC Discussion Paper No. 2012-030, 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2136955.

⁹¹ *Id.*

The costs of PAE assertion and litigation are especially harmful to startups—unfortunately an increasingly favored target of PAEs. In her survey of startups and venture capitalists, Robin Feldman found that “74% of the venture capitalists and 58% of the startup companies report that patent demands had a significant impact on a company.”⁹² She also found that “100% of venture capitalists indicate that if a company had an existing patent demand against it, it could potentially be a major deterrent in deciding whether to invest.”⁹³ Thus, even as PAEs increasingly turn to venture capitalists to fund their patent acquisition and assertion activities, they are causing harm to startups that are attempting to turn innovations into products and services and bring them to market.

Finally, in contrast to the harm caused by PAEs through excessive litigation and other assertion activities, broad industry cross-licensing arrangements historically created “patent peace,” which enabled and incentivized the commercialization of invention through the innovation process. Thus, while Lemley and Melamed are correct that there are opportunity costs of cross-licenses,⁹⁴ those costs are accompanied by a significantly increased tendency to steer resources toward further innovation and away from expenditures on litigation and defensive moves, which detract from innovation.

VI. HARM TO COMPETITION AND INNOVATION BY PRIVATEERING

A. *Privateering and hybrid PAEs*

As discussed in the prior sections, litigation and assertion activities of PAEs are increasing dramatically. Unless patent and related policy reforms are implemented, there is every reason to believe that this escalating trend will continue, as will the economic harm to inno-

⁹² Feldman, *supra* note 3, at 2.

⁹³ *Id.* at 3.

⁹⁴ Lemley & Melamed, *supra* note 32, at 2131 (“A cross-license among industry participants . . . puts an implicit value on the patents owned by each side. That value might not be fully understood, or it might be underestimated, but it is real nevertheless.”).

vation. Of particular concern—especially with respect to the use of antitrust enforcement by public agencies or private actors—is the transfer of patents by a PE to PAEs with conditions or incentives that cause the PAEs to target the competitors of the PE in downstream markets. Many transfers of patents from PEs to PAEs do not create those incentives. Such transfers may contribute to the general rise in patent litigation and may impose social welfare costs, but they are not the focus of this section. Instead, I will focus on issues that arise when a PE transfers patents to a PAE with the intended or likely effect of those patents being used against the competitors of the PE. Scott Morton and Shapiro have referred to such PAEs as hybrid PAEs, reflecting the fact that their interests and incentives are affected by the competitive interests of the PE from which their patents were transferred.⁹⁵

Transfers from competitive practicing entities (CPEs) to hybrid PAEs are one form of “privateering,” as explained by Thomas Ewing:

The privateer, a specialized form of non-practicing entity . . . , asserts the [intellectual property rights] against target companies selected by the sponsor. The sponsor’s benefits do not typically arise directly from the third party’s case against a target but arise consequentially from the changed competitive environment brought about by the third party’s assertion [of intellectual property rights] [Intellectual property] privateering . . . can be defined as: the assertion of [intellectual property rights] by an entity (the privateer), typically in the form of [a non-practicing entity], against a target company for the direct benefit of the privateer and the consequential benefit of a sponsor, where the consequential benefits are significantly greater than the direct benefits.⁹⁶

Of course, in some cases, transfers of patents by PEs to PAEs do not involve the targeting of the PE’s competitors. A recent study by Michael Risch found that most troll-owned patents come from practicing entities spinning off part of their portfolio.⁹⁷ And many PAEs are former PEs that were once in the business of producing products,

⁹⁵ Fiona Scott Morton & Carl Shapiro, *Strategic Patent Acquisitions 2* (July 2, 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2288911.

⁹⁶ Ewing, *supra* note 5, at 35.

⁹⁷ Michael Risch, *Patent Troll Myths*, 42 SETON HALL L. REV. 457, 461 (2012).

but no longer do so. Instead, they focus their efforts on monetizing their own patents, so that no patent transfer is involved.⁹⁸

However PAEs come to hold their patents, PAEs are first and foremost monetizers, that is, they attempt to maximize revenues from licensing, litigation settlements, and damages awards (whether lump sum or running royalties). Only in particular circumstances—which I address in this section—do such monetizers have incentives to target a particular class of competitors in an industry. In many cases, PAEs attempt to monetize from as many assertion targets as possible and do not discriminate among those targets on the basis of their competitive positions in the industry. Indeed, some of the worst abuses by PAEs occur because they are indiscriminate in their assertion activities—bringing infringement claims or litigation threats against very large numbers, with little or no effort to determine whether, in fact, the targets of such threats actually practice the patents asserted, much less infringe those patents.

Thus, there is a fundamental difference between the economic incentives of conventional PAEs and hybrid PAEs, due to the competitive (or anticompetitive) benefits of patent assertion against the CPEs' rivals. As explained by Lemley and Melamed,

[a] revenue maximizing patent holder . . . will not seek royalties above the level that maximizes its revenues. Some practicing entities [or hybrid PAEs], however, are willing to seek running royalties above that level. [They] are acting not to maximize revenues from their patents, but to maximize profits from their product business They will seek to do so as long as the additional profits from product sales they can generate exceed the competitors' royalty revenues that they sacrifice to pursue the scheme. In effect, [they] are willing, for strategic reasons, to charge supra-monopoly prices⁹⁹

Thus, not surprisingly, it is increasingly common for PEs to transfer some or all of their patents to PAEs, for both strategic competitive reasons and for immediate financial gain. For example, in 2011, Microsoft and Nokia formed a strategic partnership, one element of which was the transfer 2000 patents from Nokia's patent portfolio to

⁹⁸ Once former PEs become "pure" PAEs, they often buy additional patents to assert.

⁹⁹ Lemley & Melamed, *supra* note 32, at 2145 (footnotes omitted).

MOSAID, a PAE. Many of the transferred patents are standards-essential patents for mobile communications. The parties agreed that

[i]n exchange for the transfer, MOSAID will pursue licensing (and litigation) with third 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.¹⁰⁰

In their analysis of Microsoft-Nokia's use of MOSAID as a privateer to attack their downstream competitors (Apple and Android original equipment manufacturers), Popofsky and Laufert stress that

[i]f Nokia alone had asserted the transferred patents against Android implementers (and other enforcement targets), Nokia could face patent counter-suits . . . Outsourcing enforcement of part of its [standards-essential patent] portfolio to MOSAID while retaining an interest in the resulting royalty stream enabled Nokia to sidestep this constraint on enforcement and share in the royalties MOSAID anticipates it will extract.¹⁰¹

MOSAID fits the "fact pattern" suggested by Professors Scott Morton and Shapiro, in which "two downstream firms combine their patents in a joint venture with a PAE who is incentivized to raise their rivals' costs."¹⁰² In assessing such cases, Scott Morton and Shapiro emphasize the importance of assessing "whether the combination of the two portfolios increases the joint venture's ability to credibly impose outside threats on potential licensees,"¹⁰³ which would allow the privateering PAE to charge supracompetitive royalties.

¹⁰⁰ George Addy & Erika Douglas, *Mind the Gap: Economic Costs of Innovation Perils in the Space between Patent & Competition Law* 15–16 (Davies Ward Working Paper, July 1, 2012), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2208654.

¹⁰¹ Mark S. Popofsky & Michael D. Laufert, *Patent Assertion Entities and Antitrust: Operating Company Patent Transfers*, ANTITRUST SOURCE, Apr. 2013, http://www.americanbar.org/content/dam/aba/publishing/antitrust_source/apr13_full_source.authcheckdam.pdf.

¹⁰² Scott Morton & Shapiro, *supra* note 95, at 19.

¹⁰³ Scott Morton and Shapiro define hybrid PAEs as "those having contractual relationships with downstream firms." They note that "when [a] joint venture acquires the patents, the downstream firm retains a license for itself, and perhaps for other parties it favors, such as its platform partners. The joint venture is then incentivized to assert the patents against the rivals to the downstream firm." *Id.*

B. Rationale for CPE privateering by hybrid PAEs

There are a number of reasons why a CPE would choose to use privateering against its rivals, rather than assert its patents directly: to exploit litigation risk asymmetries and reduce the likelihood of countersuits; to reduce the reputational harms of direct assertion; to avoid contractual commitments (or reduce the costs of honoring those commitments); and to reduce its antitrust exposure. I address each of these rationales in turn.

As explained in section V above, there is a fundamental difference between the risks and costs of litigation faced by a PE and a PAE because the former produces products and the latter does not. Thus, if a CPE asserted its patents against its rivals directly, it would risk countersuits brought by those rivals. That is not to say that such direct assertion and counter-assertion by rivals does not occur, but that privateering adds another means of attacking rivals.¹⁰⁴ Moreover, hybrid PAEs can exploit asymmetries in litigation costs (such as the costs of discovery) by imposing or threatening to impose those costs to pressure target PEs to settle. In principle, although the target of a hybrid PAE could reciprocate by bringing or threatening litigation against the CPE-sponsor of the hybrid PAE, the lack of transparency in many CPE-hybrid relationships makes that problematic.

CPEs may also outsource some of their patent assertions against rivals to avoid or reduce the reputational harms associated with such aggressive tactics by a PE,¹⁰⁵ and to exploit the reputational benefits of aggressive assertion by PAEs. As noted earlier, PEs frequently are engaged in “repeated games” with their rivals, involving standard-setting or other forms of industry collaboration. If a CPE gains a reputation for aggressive patent assertion, other industry players may be less likely to cooperate with that CPE in the future. For example, if a CPE aggressively prosecutes its standards-essential patents from a prior round of standard-setting against its rivals, those rivals may be less likely to support the proposals of that CPE in current or future

¹⁰⁴ The smartphone patent war between Apple and Samsung is an example.

¹⁰⁵ Although, as the number of entities engaged in aggressive patent assertion grows, there may be a corresponding decline in the negative reputational effects associated with such conduct.

rounds of standard setting. By transferring standards-essential patents to hybrid PAEs, a CPE might not be held to be accountable for the assertion activities by its sponsored hybrid PAE.¹⁰⁶

Conversely, CPEs may transfer patents to hybrid PAEs to exploit the potential advantages of the negative reputation of the PAE.¹⁰⁷ Since one important objective of the transfer is to have the hybrid PAE target the CPE's rivals, the greater the reputation of the PAE for aggressive tactics, the greater the risk and costs of not agreeing to settle by licensing the patents. In terms of the simple economics of hold up: The greater the risks and costs of litigation to the defendants, the greater the likelihood and expected value of a settlement. It may be economically rational for a hybrid (and other PAEs) to cultivate a negative reputation, to increase its ability to monetize its patents.

A third rationale for CPE privateering is that it may provide a means of avoiding various contractual commitments or reducing the cost of those commitments. Two important instances of such commitments are FRAND licensing and "no royalty stacking." Although it would be good economic policy to have such commitments "travel" with standards-essential patents when they are transferred, that is not necessarily the case (at least, not in all jurisdictions). Therefore, a hybrid PAE may attempt to abrogate such commitments through, for example, novel legal strategies or venue shopping.¹⁰⁸ Even if they ultimately fail to avoid such commitments, such efforts can raise the

¹⁰⁶ This would depend on how well the CPE has camouflaged its privateering activities.

¹⁰⁷ In addition, the "negative reputation" of the hybrid PAE could mask the anticompetitive agreement between the PE and its privateering hybrid PAE. For example, suppose that Microsoft and Nokia had struck a deal with Intellectual Ventures (IV) rather than with MOSAID. IV has a reputation of being very aggressive as it is. Why would anyone assume IV was being biased against Microsoft's and Nokia's rivals just because it was suing them? On top of this, it would have the resources to also sue noncompetitors, furthering "masking" its targeted attacks on the CPE's rivals.

¹⁰⁸ Nokia made repeated efforts to wireless standards bodies to obtain commitments for FRAND licensing and against royalty stacking. MOSAID has claimed those commitments do not apply to the patents transferred by Nokia to MOSAID. Popofsky & Laufert, *supra* note 101, at 10.

uncertainty and litigation risks faced by targeted rivals of the sponsoring CPE.

Another form of avoiding commitments is especially troubling, namely commitments made by a CPE to antitrust enforcement agencies during the process of reviewing the transfer of a patent portfolio to a PAE. The agency might well rely on such commitments in reaching a determination that the transaction will not violate antitrust laws. Yet, absent binding commitments—such as those that might be incorporated in a consent decree—it may well be possible for the hybrid PAE to ignore those commitments in the course of pursuing its patent assertions against the CPE’s rivals. Though there may be some risk of detection (perhaps upon complaints to the agency by those rivals), the lack of monitoring and reporting requirements by agencies would, at minimum, lower the risk and raise the costs of detection of broken commitments.

Finally, a CPE may attempt to use privateering to reduce its antitrust exposure, either to public enforcement actions or in private litigation.¹⁰⁹ If the CPE were to attack its competitors directly, there is a risk that enforcement agencies could take action against it (which is not to say that enforcement agencies should not bring actions against CPEs that use privateers of their own making to attack competitors). Alternatively, the target of such direct CPE assertion could assert antitrust counterclaims. This risk could restrain the anticompetitive use of patent assertion by the CPE directly, but might be less likely to restrain the conduct of a hybrid PAE. Presumably, such privateering agreements do not command or require the targeting of rivals or specified actions against the CPE’s rivals by the hybrid PAE. Rather, I would expect such agreements to create a set of incentives that would have the effect of targeting rivals of the CPEs. For example, prior to transferring the patents to a PAE, the CPE would ensure that it, and its

¹⁰⁹ Ewing, *supra* note 5, at 59 (“Privateering, per se, does not appear to give rise to civil or equitable liability under current law. This does not mean that a privateering target cannot bring a counterclaim against a sponsor once the sponsor’s presence is revealed; it means instead that the target will need to identify and prove some specific tort that the sponsor has committed by privateering, and the available claims will vary depending on the circumstances of particular cases.”).

strategic partners, retain licenses to those patents. Thus, in order to monetize the transferred patents, the hybrid PAE could be expected to target those who do not hold licenses—namely, the rivals of the CPE.¹¹⁰

C. *Rewards to and competitive harms from CPE privateering and hybrid PAEs*

Though not all assertion activities by hybrid PAEs necessarily cause competitive harm, there is a troubling alignment of the rewards to both the CPE and hybrid PAE on the one hand, and competitive harm to the CPE's rivals on the other. I now discuss some of the important potential rewards to CPE-sponsored privateering and the manner in which it harms competition.

The overarching interest that CPEs have in privateering is raising rivals' costs,¹¹¹ which can be accomplished in any number of ways. This can occur, for example, through settlements or damages awards (especially if they involve running royalties, which raise rivals' marginal costs, thereby causing them, as profit-maximizing firms, to charge higher prices and thereby compete less aggressively with the CPE); by imposing excessive litigation costs (including diverting the attention of management and technical staff from productive activities); or by raising doubts among rivals' customers, who may be concerned about potential liability from using an infringing product.

The use of privateering may substantially increase the potential rewards for and anticompetitive harm of royalty stacking. As explained in section II.C, royalty stacking is problematic in patent-thick products and industries. Moreover, the more disaggregated the ownership of patents, the more problematic is royalty stacking.¹¹²

¹¹⁰ For example, in the MOSAID case discussed above, "Microsoft and Nokia retain certain licenses to the transferred patents, [so] Android licensees comprise MOSAID's most obvious enforcement targets (along with Apple)." Popofsky & Laufert, *supra* note 101, at 10.

¹¹¹ For the seminal treatment of the concept of raising rivals' costs, see Steven C. Salop & David T. Scheffman, *Raising Rivals' Costs*, 73 AM. ECON. REV. 267 (1983).

¹¹² See Lemley & Melamed, *supra* note 32, at 2179 ("disaggregation of patents, including privateering . . . can exacerbate the royalty stacking problem and can be used to raise rivals costs") (footnote omitted).

As patent thickets grow ever more dense due to the technological forces described in section II.D, so too will the opportunities for raising rivals' costs through ever taller royalty stacks, by CPEs' spinning off portions of their patent portfolios to multiple hybrid PAEs.

While up to some point, a bigger patent portfolio is better, portfolios can become so large that, at the margin, they generate diminishing returns. When a portfolio is that large, the economic value of patents at the margin will be less than the average value, and the whole of the portfolio is worth less than the sum of its parts. Suppose a CPE had a portfolio of 20,000 patents, which it used to reach significant cross-licensing agreements with other holders of large patent portfolios. As a practicing entity, its portfolio continues to grow, though, in some cases beyond the level needed to negotiate favorable cross-licensing agreements with other PEs. In that case, the total value of a CPE's portfolio can be increased by splitting the patents up. By transferring a portion of the patents to one or more hybrid PAEs, in exchange for a share of revenues from litigation and licensing, the CPE can increase the value of the total portfolio, while also raising its rivals' costs.

Thus, it is with good reason that Scott Morton and Shapiro—two former Chief Economists of the U.S. Department of Justice—conclude their analysis on this cautionary note:

We consider the hybrid PAE model to be the most troubling. We have in mind a hybrid PAE that is using outsize threats to obtain payments in excess of reasonable royalties, while working with a practicing entity who has its own incentive to raise its rivals' costs. The costs imposed by PAEs on downstream firms are particularly harmful to consumers when they discourage or distort innovation, e.g., by keeping off the market products that would otherwise have been introduced or by causing a whole industry to pick an inferior technology.¹¹³

Given the economic harm to competition that can be caused by CPE-sponsored privateering, there are important roles for antitrust authorities: blocking potentially anticompetitive patent transfers, and bringing enforcement actions against anticompetitive conduct by

¹¹³ Scott Morton & Shapiro, *supra* note 95, at 22.

CPE-sponsored PAEs.¹¹⁴ I concur with Lemley and Melamed that there should be three types of antitrust limits:

First, agreements to sell . . . patents that seem likely to . . . exacerbate a double marginalization problem could be challenged under both . . . the Sherman Act and . . . the Clayton Act, especially if one or more of the entities involved is likely to have strategic incentives to impose costs on rivals Second, . . . antitrust agencies can condition approval of mergers or other consent decree settlements on an agreement not to engage in privateering. Finally, the law might be revised to require disclosure of privateering agreements so [they] can be detected and hopefully deterred.¹¹⁵

Unless enforcement agencies take steps such as these, the economic harm to competition and innovation caused by PAEs and privateering will continue to grow. Public enforcement actions are necessary because private antitrust enforcement actions are unlikely to be sufficient, and private patent enforcement is part of the problem, not the solution: “[W]hatever the health of patent law’s current private-enforcement regime, I seem justified in worrying that the system is currently on a course toward worsening rather than improving performance.”¹¹⁶ Although antitrust agencies cannot solve many of the flaws in the patent system, they can and should use their competition advocacy and enforcement capabilities to target the use of patents for anticompetitive purposes.

¹¹⁴ For a detailed analysis of the role of antitrust enforcement in policing anticompetitive conduct by hybrid PAEs and their CPE sponsors, see Popofsky & Laufert, *supra* note 101, at 6.

¹¹⁵ Lemley & Melamed, *supra* note 32, at 2179–80 (footnotes omitted).

¹¹⁶ John M. Golden, *Patent Privateers: Private Enforcement’s Historical Survivors*, 26 HARV. J.L. & TECH. 599, 599 (2013).