

**INNOVATION UNDER THREAT?
SOME ECONOMIC AND LEGAL CONSIDERATIONS
ON THE PATENT WARS AND TROLLS**

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“If I have seen further, it is by standing upon the shoulders of giants”

Isaac Newton

Innovations are rarely produced in complete isolation. In many complex industries (such as biotechnologies, information technologies, telecommunications, electronics and software), innovations are typically the result of a cumulative process. For the sake of the analysis, it is useful to distinguish between two types of cumulateness. On the one hand, innovations often build on previous inventions; a famous quote attributed to Isaac Newton¹ nicely illustrates this idea: “If I have seen further it is by standing on the shoulders of giants.” We use the term *sequential innovations* to refer to the fact that a particular innovation leads to second-generation innovations. For instance, the invention of the laser lead to surgical applications, spectroscopy, CDs and DVDs, etc. On the other hand, it is often the case that separate inventions have to be combined to create value. One talks then of *complementary innovations*: a second-generation product requires the input of a number of different first-generation innovations. Think of firms in the electronics industry (e.g., trying to produce new peripherals to be coupled with personal computers or video game consoles) or in the biotech industry (e.g., combining genes to bioengineer a new crop seed). In practice, sequential and complementary innovations go hand in hand as most products derive from first-generation innovations and combine various first-

¹ Letter to Robert Hooke, 15 February 1676 (see the presentation of this quote on <http://www.bbc.co.uk/worldservice/learningenglish/movingwords/shortlist/newton.shtml>).

generation innovations (the coming to age of the audio CDs was not only relying on the laser technology, but on other primary technologies such as digital encoding techniques leading to the MP3 and other musical file formats).

Cumulative innovations raise a number of problems that the patent system, without further institutional provisions, is ill equipped to cope with. In this article, we focus on the main problem raised by sequential innovations, namely that a patent on the first-generation innovation might confer the patentee a hold-up right over subsequent innovations. In particular, we will see how the opportunistic conduct of some firms might exacerbate this problem.²

Before that, we discuss the case of the smartphone industry, where the problems of cumulative innovations are particularly acute and reinforced by the strong role of standards.³

I. – The Smartphone Patent Wars

The “Smartphone Patent Wars” refers to the hundreds of patent infringement cases initiated all over the world by the big players on the smartphone market over the last years.⁴ In April 2012, Lucy Koh, a U.S. District Court Judge, tried to force a truce between two of the main contenders, namely Apple and Samsung. The two firms had indeed spent long months suing and counter-suing each other, in particular in the U.S. and in Europe, for alleged patent infringements. The peacemaking process that Lucy Koh initiated did not succeed at that time – but the evolving market conditions and the rather mitigated outcome of many lawsuits prompted Apple and Samsung to sign a partial truce. In August 2014, the two companies thus decided to drop all cases outside the U.S. Apple probably does not yet accept to abandon what it could get at home where more is at stake: around \$3 billion in damages⁵ and a

² The main problem for complementary innovations, referred to as the ‘tragedy of the anticommons’, is that the allocation of IP rights to separate right-holders results in higher total prices (a phenomenon also known as ‘royalty-stacking’). In this case, solutions may come from cross-licensing and patent pools (see C. SHAPIRO, “Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting”, *NBER/Innovation Policy and the Economy*, 1, 2001, pp. 119-150).

³ In addition to (mobile) telecommunications, the standard dependent sectors include the consumer electronics, automotive and smart grids industries (see ECSIP, *Patents and Standards. A modern framework for IPR-based standardization*, Final Report to the European Commission, 2014, available online).

⁴ For a detailed account of the smartphone patent wars, see the FOSS patents blog: <http://www.fosspatents.com/>.

⁵ In a first *Apple v. Samsung* litigation, a San Jose Court, in 2012, granted Apple a bit more than \$1 billion damages. After the retrial of 2013, this amount was reduced to \$929 million. The Samsung appeal is pending. Apple initiated another \$2 billion trial in 2014. It is expected that the proceedings (appeal and second trial) will last till at least mid-2017. Although the bulk of the decisions were in Apple’s favor, Apple has not yet collected any amount in the U.S. and did not succeed in banning Samsung’s products. See G. DUNCAN, “Why Apple and Samsung Throwing Down? A Timeline of the Biggest Fight in Tech”, 4 April 2014, available at <http://www.digitaltrends.com/mobile/apple-vs-samsung-patent-war-timeline/#!bPwuy3>.

possible ban covering the whole U.S. territory.⁶ Similarly Apple and Google decided in 2014 to drop all lawsuits between them, including patent litigation involving Google's Motorola.

The legal quagmire that plagues the smartphone industry results from a combination of forces.

First, smartphones are the archetypal example of a cumulative innovation as they exhibit the two types of cumulateness. There is complementarity because smartphones result from the collision between computers and mobile phones, which are already cumulative in their own right. There is also sequentiality because smartphones have to incorporate a number of existing standards (e.g., Wi-Fi access, email transfers or video display).

Second, the problems raised by complementarity and sequentiality of innovations are magnified by the sheer density and size of the 'patent thicket'⁷ that engulfs the smartphone industry: according to estimates,⁸ a smartphone is open to a quarter of a million patent claims. Factoring in the diversity of players (as companies flock from industries as diverse as equipment manufacturing and software development) and the crucial need for interoperability (just try to imagine how painful your life would be if several incompatible email services were coexisting), it is easy to understand why even though private solutions to the previous problems do exist, these solutions are very hard to achieve in the smartphone arena. For instance, even if the main players may agree that forming a patent pool⁹ is in their common interest because it would increase total industry profits, they are most likely to disagree about how to divide the increased profits among them; they are also likely to free-ride on the other players' efforts to reduce royalties, thereby making the patent pool as unstable as any cartel can be.

From a social point of view, these unceasing patent disputes are not only a waste of resources but, more fundamentally, they may stifle innovation in the industry. As Shapiro nicely puts it, "In these industries, the danger that a manufacturer will step on a land mine is all too real. The result will be that some companies avoid the minefield altogether, that is, refrain from introducing

⁶ See D. WAKABAYASHI, "Apple, Samsung Call Patent Truce Outside the U.S.", *Wall Street J.*, 5 August 2014, available at <http://online.wsj.com/articles/apple-samsung-call-patent-truce-outside-u-s-1407291456>.

⁷ A patent thicket is defined as "an overlapping set of patent rights requiring that those seeking to commercialize new technology obtain licenses from multiple patentees". See C. SHAPIRO, "Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting", *op. cit.*, p. 119.

⁸ See R.A. CASS, "Patent Litigants, Patent Quality, and Software: Lessons from the Smartphone Wars", *Minnesota Journal of Law, Science & Technology*, 16, 2015, forthcoming.

⁹ Forming a patent pool consists in licensing an entire group of patents in a single package to anyone willing to pay the associated royalties.



certain products for fear of hold-up. Other companies will lose their corporate legs, that is, will be forced to pay royalties on patents that they could easily have invented around at an earlier stage, had they merely been aware that such a patent either existed or was pending.¹⁰ Of course, ultimately the expected value of these royalties must be reflected in the price of final goods”.¹¹

II. – Sequentiality and the adequate scope of the innovator’s IP right

Patents have a double purpose: protect R&D investments and facilitate the diffusion of knowledge (other researchers will benefit from the publication of the patent; future research might also be indirectly improved as solved and still open questions can be better identified). Obviously, the latter purpose becomes even more important in the presence of sequential innovations. This forces us to address two important questions: (i) Should the initial innovator have a right on subsequent innovations? (ii) Insofar as subsequent innovations are not necessarily substitute to the initial innovation (they use it or reproduce it), should they be considered as infringing?

Intuitively, in order to provide each innovator with the proper incentives, the economist among us would like to answer ‘yes’ to the first question and ‘no’ to the second. The lawyer probably prefers to respond, as usual, ‘it depends’. The scope of the right on a subsequent innovation is the real issue for an IP lawyer: in certain instances of derivation from the initial innovation, the first innovator deserves some right or return on subsequent innovation, in other cases, no. The question is then whether the scope of the right on the follow-on innovation adequately respects the need to remunerate the first innovator while preserving the incentive for the second innovator to further innovate.

As earlier innovators provide benefits to later innovators, they should be compensated for their contributions by being granted some right on subsequent innovations. But that right should not go too far: if all subsequent innovations were considered as infringing, later innovators would have no incentive to invest if they might be barred from marketing the follow-on innovation. Or they might have only a reduced incentive if part of the revenues they can anticipate would go to the innovator further up in the chain. The larger the rights granted

¹⁰ In the U.S., the traditional ‘first-to-invent’ rule (transformed in a ‘first inventor-to-file’ system by the 2011 America Invents Act) and the possibilities to delay the publication of the patent application lead to ‘submarine’ patents that only come to light at a late stage. Moreover, when published, the patents documents can be difficult to understand and to navigate so that patents can remain “invisible” even to well-trained eyes, until the patent owner sends a cease and desist letter referring to the scope of the allegedly infringed patent.

¹¹ C. SHAPIRO, “Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting”, *op. cit.*, p. 126.

to the initial innovator, the lower the incentives for subsequent innovators, and vice versa. The problem is to determine how profit should be divided between the successive innovators, especially when there is a long chain of innovators relying on each other. This is a delicate problem and, unfortunately, the scope of the various intellectual property rights with regard to subsequent innovation is not as clear as it should. When does the subsequent innovation encroach on the patent claims of the initial patent? Claims interpretation is a complex process and might depend on controversial legal theories such as the doctrine of equivalents. The same uncertainty applies for copyright. What is the scope of the reproduction and adaptation rights held by the owner of a copyright on software? Is there an infringement when only a few lines of code are reproduced? Does the reuse of non-literal elements, such as the structure or sequence of the computer program, constitute a breach of the reproduction or adaptation rights? This remains a matter for the judges to determine. The boundaries of copyright protection are not clear-cut, as showed by the on-going *Oracle v. Google*¹² litigation in the U.S. regarding the recycling by Google's Android system of some lines of codes from the Java interface and the use of its software design.¹³

III. – A simple model of hold-up¹⁴

To formalize the previous discussion, consider two innovations (noted 1 and 2) that can be produced by separate innovators. Suppose that the innovations are sequential; in particular, innovation 2 needs the results of innovations 1 to be produced. As a result, if innovation 1 is not produced, innovation 2 will not be produced either. For the sake of the example, suppose that the value of innovation 1 is equal to 10 and its R&D costs are equal to 12; as for innovation 2, its value and costs are respectively given by 8 and 5. We see that the total value of the two innovations ($10+8=18$) is larger than their total R&D costs ($12+5=17$); it would therefore be worth producing them. However, innovation 1 is not profitable on its own. This means that granting a patent for each innovation would not induce the production of innovation 1 (therefore

¹² For the U.S. District Court, the elements of the Java Application Programming Interface (API) incorporated in the Android operating system are not copyrightable (*Oracle America, Inc. v. Google, Inc.*, U.S. District Court for the Northern District of California, 31 May 2012). The Court of appeals of the Federal Circuit reversed the decision on the copyrightability issue, holding that the "structure, sequence and organization" of an API was copyrightable, but remanded the issue of the fair use exception to the District Court. The Federal Circuit also ruled for Oracle regarding the small amount of literal copying, holding that it was not *de minimis* (*Oracle America, Inc. v. Google, Inc.*, Court of appeals Federal Circuit, 9 May 2014).

¹³ Java was initially developed by Sun Microsystems, which was later acquired by Oracle.

¹⁴ We follow here F. LÉVÉQUE and Y. MÉNIÈRE, *The Economics of Patents and Copyright*. The Berkeley Electronic Press, 2004. Their model is itself adapted from J. GREEN and S. SCOTCHMER, "On the Division of Profit in Sequential Innovation", *Rand Journal of Economics*, 26, 1995, pp. 131-146.

making the production of innovation impossible). To give sufficient incentives to innovator 1, one must therefore grant a broader (or ‘deeper’) patent; in other words, innovator 1 should be granted rights on innovation 2 as well. Yet, this would inevitably undermine innovator 2’s incentives. Indeed, once innovator 2 has sunk the R&D cost, innovator 1 will be in a position to appropriate the full value of this innovation. That is, innovator 2 would be ‘held-up’ and would end up making a loss of 5. Anticipating this turn of events, innovator 2 would refrain from incurring the R&D costs: innovation 2 would not be produced and innovation would not be produced either (as it is not profitable *per se*).

A solution to this problem would be that innovator 1 grants an *ex ante* license on her innovation to innovator 2, where *ex ante* refers to the idea that the license is granted before innovator 2 sinks any R&D costs (*i.e.*, at the time where innovator 2 keeps his options open).¹⁵ However, the presence of asymmetric information about the potential value of innovation 2 often makes such licensing deals impractical.

IV. – Patent assertion entities and non-practicing entities

Over the last decade, new types of IP intermediaries have developed a business model around a form of hold-up. The term ‘patent assertion entities’ (PAEs) is used to describe companies that acquire patent portfolios not to exploit them but to aggressively negotiate licenses, potentially under the threat of an action for patent infringement.¹⁶ Such companies are sometimes identified as ‘patent licensing and enforcement companies’. They also go by the more disparaging name of ‘patent trolls’. Trolls are small evil creatures from Norse mythology, which often live under bridges and pester travellers for safe passage; similarly PAEs are accused of taking firms by surprise once they have made irreversible investments. PAEs can use the threat of a (temporary or permanent) injunction to extort hefty fees in licensing negotiations, or huge settlements from companies they have accused of infringing. A famous example is the \$612.5 million out-of-court settlement that Research in Motion accepted to pay to NTP in 2006 to avoid the risk of its popular BlackBerry service being shut down. Component-driven industries, like information technology, are particularly prone to such hold-ups.

¹⁵ See *ibid.*

¹⁶ A 2013 White House Study lists among the abusive tactics of PAEs: “threatening to sue thousands of companies at once, without specific evidence of infringement against any of them; creating shell companies that make it difficult for defendants to know who is suing them; and asserting that their patents cover inventions not imagined at the time they were granted”. Executive Office of the President, *Patent Assertion and U.S. Innovation* (June 2013), available at http://www.whitehouse.gov/sites/default/files/docs/patent_report.pdf.

Trolls are also sometimes designated as ‘non-practicing entities’ (NPEs). An NPE is a company that owns patents but does not design or manufacture a product or process. NPEs thus include universities, research organisations, technology transfer offices, etc. Obviously, not all NPEs do aggressively assert their patents and PAEs are thus a subset of NPEs.

The definition of a PAE remains controversial. Although President Obama expressed its concerns over PAEs,¹⁷ a 2013 White House Study¹⁸ concluded that some entities that do not produce or manufacture a product are nevertheless contributing to innovation. For instance, those entities can play the role of an intermediary by connecting inventors with manufacturers and revealing the hidden value of some technologies. By closely monitoring the technology developments so as to anticipate the next generation of products and by matching patent holders and patent buyers, those entities can act as efficient ‘patent brokers’. Therefore adopting a law to curb the abusive practices of PAEs without affecting the positive role of the NPEs is not an easy exercise. The difficulty to define the right target of anti-troll legislation explains, among others, why a U.S. bill known as the SHIELD Act (Saving High Tech Innovators from Egregious Legal Disputes Act) and other draft laws were not adopted over the last years.¹⁹

V. – Patent privateers

Large innovating companies also seem to have an ambivalent attitude to PAEs: officially, they complain about PAEs’ alleged extortionist behaviour; yet, they sometimes hire PAEs for undercover operations of patent assertion. Such PAEs are nicknamed ‘patent privateers’. Like their forefathers,²⁰ patent privateers are armed by a powerful sponsor, with the aim of assaulting their sponsor’s rivals.

¹⁷ In a *Google Hangout* interview of February 2013, President Obama discussed the issue of non-practicing entities that “don’t actually produce anything themselves” but that are “just trying to essentially leverage and hijack somebody else’s idea” to “see if they can extort some money out of them” (see <https://www.techdirt.com/articles/20130214/14351821988/president-obama-admits-that-patent-trolls-just-try-to-extort-money-reform-needed.shtml>).

¹⁸ Executive Office of the President, *Patent Assertion and U.S. Innovation*, *op. cit.* (This study was prepared by the President’s Council of Economic Advisers, the National Economic Council, and the Office of Science & Technology Policy).

¹⁹ Although the U.S. House of Representative passed an anti-troll bill with overwhelming bipartisan support in December 2013, it now appears unlikely that the U.S. Congress will adopt such law in the coming years, but pressure is mounting in certain States, such as Virginia, Georgia or Ohio (see D. PORTER, “A new Ohio weapon against patent trolls?”, *Technology Law Source*, 28 July 2014 available at <http://www.technologylawsource.com/2014/07/articles/intellectual-property-1/a-new-ohio-weapon-against-patent-trolls/>).

²⁰ In 1572, Queen Elizabeth I of England commissioned Francis Drake to sail for America and encouraged him to plunder Spanish vessels on his way. Drake had thus all the attributes of a pirate, except that he was not working for his own account but for a government. This type of pirate was known as a ‘privateer’. Privateers presented the big advantage of allowing one nation to harry another one without officially attacking it. In other words, nations were avoiding the costs (and risks) of state-run warfare by outsourcing the ‘business’ to profit-maximising entrepreneurs.

The sponsors – and their rivals – are established operating companies, mainly in the IT and consumer electronic sectors. Privateers receive patents and their raids take the form of expensive and incessant patent infringement litigation.²¹

Sponsors of privateers see nothing wrong in such deals: they are simply looking for the most efficient way to realize a legitimate return on their high and risky investments in intellectual property. Using privateers is efficient indeed as it allows operating companies to outsource litigation and to avoid a countersuit against their own operations; and if the competitors' costs are raised in the process, even better! Naturally, the targets of the privateers' raids have a totally different opinion. Standing at the forefront of the fight against privateering is Google. In April 2013, Google wrote a letter (co-signed by BlackBerry, Earthlink, and Red Hat) to the Federal Trade Commission and the U.S. Department of Justice to ask them to take action not only against PAEs but also against the companies who supply them with weapons.²²

In the following sections, we try to assess the risks of hold-up at the light of various parameters.

VI. – The risk of patent hold-up is higher in case of standard-essential patents

A standard is a written codification in the form of technical specifications of the common features of a product or process. Standards adopted by organisations (called the standard-setting organisations or SSOs such as ETSI²³ in Europe) allow complementary or component products from different manufacturers to be combined or used together, thus enhancing consumer choice and convenience and reducing costs.²⁴ When a standardised technology includes patented inventions, the manufacturers are not able to implement the standard without getting an authorisation from, and thus paying some royalties to, the holders of the patents deemed 'essential'²⁵ to the standard. In a case involving a standard

²¹ Here are two examples of patent privateering agreements: the first took place in 2011 between Microsoft, Nokia and MOSAID; the second was concluded in 2013 by Ericsson and Unwired Planet. Both MOSAID and Unwired Planet (formerly known as Openwave Systems) are well known PAEs, and both deals involved the transfer of more than 2,000 patents.

²² See: <https://docs.google.com/file/d/0BwxyRPFduTN2VTE4TXINcW9MR2s/edit?pli=1>.

²³ The European Telecommunications Standards Institute better known as ETSI is the SSO responsible for ICT in Europe (see <http://www.etsi.org/>).

²⁴ This is the definition proposed by D. GERADIN, "Ten Years of DG Competition Effort to Provide Guidance on the Application of Competition Rules to the Licensing of Standard-Essential Patents: Where Do We Stand?", 2013, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2204359.

²⁵ The 'essentiality' of an IP right is defined as follows in the ETSI IPR Policy and Guide on IPRs (19 September 2013): "ESSENTIAL as applied to IPR means that it is not possible on technical (but not commercial) grounds, taking into account normal technical practice and the state of the art generally available at the time of standardization, to make, sell, lease, otherwise dispose of, repair, use or operate EQUIPMENT or METHODS which comply with a STANDARD without infringing that IPR" (see: <http://www.etsi.org/images/files/IPR/etsi-guide-on-ipr.pdf>, under pt 1.5, ref. to clause 15.6).

essential patent (SEP), there is an increasing risk of abuse linked to the enormous leverage that the patent holder gains from the inclusion of its patented technology in the standard shared by manufacturers and users. For instance, “more than 23,500 patents have been declared essential to the GSM and the ‘3G’ or UMTS standards developed by ETSI”.²⁶ Once such a standard has been adopted, switching to another technology risks to be too onerous for the users of the standards, for instance the telecom operators using a mobile phone standard. This might be called the “lock-in” effect. In this instance, the SEP holder is able to capture the economic value attributable not only to its patented technology, but also to the standardization process itself. Because of this risk, SSOs generally require the participants to the standardisation process to license their SEPs on “fair, reasonable and non-discriminatory” (so-called ‘FRAND’) terms. However, accepting to negotiate under FRAND terms does not mean that the level of royalties is capped, and there is still some room for the licensing negotiation conducted outside the SSO. The holders of SEPs can request excessive royalties or the implementers can, without just motive, refuse to pay the arguably reasonable amounts proposed by the SEP holders.

Things are particularly delicate when the SEP holder seeks a Court injunction to enforce its patents and to obtain better conditions (higher royalties). Denying the possibility for the SEP holder to get an injunction against an implementer of its technology would create the risk that it remains under-compensated, and this could lead to a “reverse hold-up” situation. From a more legal perspective, to completely ban injunctions could be considered as a disproportionate taking of the intellectual property right of the SEP holder, incompatible with the protection of intellectual property as a fundamental right of the EU.²⁷ To assess whether seeking an injunction is abusive requires taking into account the particular circumstances, including whether the patent holder tries to obtain onerous licensing terms and whether the alleged infringer is a willing licensee.

VII. – Did the European Commission end the smartphone patent wars?

Not a surprise that the European authority in charge of competition (the DG Competition of the European Commission) has focused its efforts on the problem of SEPs. On 29 April 2014, the European Commission in the Motorola

²⁶ EC, *Competition policy brief*, issue 8, June 2014, p. 2, available at: http://ec.europa.eu/competition/publications/cpb/2014/008_en.pdf.

²⁷ Art. 17(2) of the Charter of Fundamental Rights of the EU provides that “Intellectual property shall be protected” in the same manner as other forms of property (art. 17(1), Charter).

and Samsung cases adopted rules aimed at ending the smartphone patent wars.²⁸ The two cases involve SEPs, but the PAEs are not NPEs: both Motorola Mobility (owned by Google) and Samsung are major manufacturers and distributors of smartphones.

The Commission ruled that Motorola, which was seeking to enforce its SEPs against Apple in Germany, committed an abuse of a dominant position under article 102 of the Treaty on the Functioning of the European Union (TFEU) in view of the “particular circumstances” in which the injunction was used.²⁹ Apple had agreed with Motorola that in case of dispute the German courts would set the applicable FRAND rate and Apple would pay the royalties accordingly. Thus Apple was a ‘willing licensee’. Samsung nevertheless sought a temporary injunction based on a SEP. Following the enforcement of the temporary ban on Apple’s online sales of iPhones and iPads to German consumers, Apple was forced to enter into an onerous settlement with Motorola. The settlement’s clauses by which Apple had to give up its invalidity and non-infringement claims against Motorola were considered as anti-competitive. Those clauses in practice might have forced Apple to pay for invalid and non-infringed SEPs, which would be against the public interest.³⁰ For DG Competition, the public interest requires that potentially invalid and non-infringed patents remain under scrutiny of the courts, which in turn requires that would-be infringers remain free to challenge the patents before the Courts.³¹

On the same day (29 April 2014), DG Competition, in the Samsung case, accepted the legally binding commitments by Samsung Electronics on SEP injunctions.³² Samsung committed for a period of five years not to seek injunctions based on any of its SEPs (present and future) on smartphone and tablets technologies against would-be licensees who sign up to a specified licensing framework. The licensing framework provides that the parties will negotiate during a period of up to 12 months and that, in case no agreement is reached, the FRAND terms will be determined by a court, or if both parties agree, by an arbitrator. This commitment has been considered as creating a

²⁸ Significantly, the *Financial Times* article referring to the two DG Competition decisions is entitled: “Brussels rules to end mobile patent wars”, *Financial Times*, 30 April 2014.

²⁹ EC Press release, *Antitrust: Commission finds that Motorola Mobility infringed EU competition rules by misusing standard essential patents*, IP/14/489, available at http://europa.eu/rapid/press-release_IP-14-489_en.htm.

³⁰ EC, *Competition policy brief*, *op. cit.*, p. 3.

³¹ A study for the Commission (see ECSIP, *Patents and Standards. A modern framework for IPR-based standardization*, *op. cit.*, quoted in *Competition policy brief*, *op. cit.*, p. 4) estimates that more than 30% of European invalidity actions lead to the invalidation of the patents and that around 50% of the challenged patents are found not to be infringed.

³² EC Press release, *Antitrust: Commission accepts legally binding commitments by Samsung Electronics on standard essential patent injunctions*, IP/14/490, available at http://europa.eu/rapid/press-release_IP-14-490_en.htm.

‘safe harbor’ for all potential licensees of Samsung’s SEPs. It remains to be seen how this process, subject to the supervision of an independent monitoring trustee, will work. It will be a complex task for a Court to determine the FRAND terms. The solution designed by DG Competition risks to shift the burden to the judicial authorities, which are not necessarily better equipped to deal with those issues.

The European Commission believes that the two antitrust decisions of April 2014 provide “a path to ‘patent peace’ in the telecommunications industry”.³³ Further to the Motorola and Samsung decisions, the test under which holders of SEPs who have pledged to grant licenses to their SEPs on FRAND terms can be held guilty of an abuse of a dominant position when they seek injunctions remains uncertain. The Court of Justice of the EU (CJEU) will address this question in its preliminary ruling in the *ZTE v. Huawei* case,³⁴ but it is likely that the response will remain in line with the DG Competition approach. In addition, the CJEU as usual might leave quite some room for the national court to apply its ruling on the conditions for an abuse of domination position by the holder of a SEP. But the procedural solution put in place by the DG Competition decision in the Samsung case appears an attractive way to solve the conundrum. Whether the smartphone wars are over in Europe thus remains to be confirmed, but it is clear that holders of SEPs will think twice before seeking to get an injunction before the courts. Also, two of the most aggressive PAEs in the smartphone battles, Apple and Samsung, signed a truce in August 2014 ending all their litigation outside the U.S. (see above). This partly results from the mounting pressures on PAEs; at least it indicates that the fiercest battles are behind.

VIII. – The risk of patent hold-up in the U.S.

The problem of patent hold-up seems more acute in the United States. There are several reasons for this. In general, the risk is higher if the leverage power of the patent holder is stronger. The mere size of the U.S. market, combined with its

³³ EC, *Competition policy brief, op. cit.*, p. 1.

³⁴ CJEU, no. C-170/13. The questions referred by the Landgericht Düsseldorf (Germany) in April 2013 include: “Does the proprietor of a standard-essential patent who informs a standardisation body that he is willing to grant any third party a license on fair, reasonable and non-discriminatory terms abuse his dominant market position if he brings an action for an injunction against a patent infringer although the infringer has declared that he is willing to negotiate concerning such a license? Or is an abuse of the dominant market position to be presumed only where the infringer has submitted to the proprietor of a standard-essential patent an acceptable, unconditional offer to conclude a licensing agreement which the patentee cannot refuse without unfairly impeding the infringer or breaching the prohibition of discrimination, and the infringer fulfills his contractual obligations for acts of use already performed in anticipation of the license to be granted?”

relevance for a technology to succeed globally, especially in the IT field, just increases the leverage of any U.S. patent owner. Other reasons are more directly linked to the peculiarities of the U.S. rules on patent enforcement. The easiness to get an injunction (*i.e.*, a Court order against further infringement) is one decisive factor for the development of PAEs.

Because of the abusive tactics used by some PAEs, the U.S. Supreme Court in its 2006 *eBay v. MercExchange*³⁵ decision opposed the practice of automatically issuing a permanent injunction whenever a patent is found valid and infringed. The Supreme Court imposed a four-pronged test that “requires a plaintiff to demonstrate: (1) that it has suffered an irreparable injury; (2) that remedies available at law are inadequate to compensate for that injury; (3) that considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction. The decision to grant or deny such relief is an act of equitable discretion by the district court, reviewable on appeal for abuse of discretion”. This test thus leaves quite a broad discretion to the Courts. At the same time, the Supreme Court decided that an injunction should not be denied simply because the plaintiff does not practice the patented invention. Thus, actions of NPEs, which include university researchers or self-made inventors, should not be discarded by principle. In other decisions since 2006, the U.S. Supreme Court reduced the exclusionary power and the scope of patents while, together with the U.S. Patent and Trademark Office, contributing to an increase in the quality of U.S. patents. However, as found in a 2013 report of the U.S. Government Accountability Office (GAO),³⁶ many patent lawsuits are triggered by “the prevalence of patents with unclear property rights” and among those patents, the software-related patents often have “overly broad or unclear claims or both”. A lot of uncertainties also derive from the fact that in the U.S. (contrary than in Europe), patent cases are judged by a jury (the patent cases decided by the bench constitute a minority).

In 2012, the America Invents Act or AIA (which reformed the U.S. patent system) provided additional safeguards against the potential extortionist behaviour of PAEs. For instance, the AIA limits PAEs’ ability to join multiple defendants in a single lawsuit, thereby increasing their costs. But as admitted by President Obama during a Google Hangout conversation (February 2013), “our efforts at patent reform only went about halfway to where we need to go” and an additional consensus needed to be reached on

³⁵ *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 2006.

³⁶ See <http://www.gao.gov/assets/660/657103.pdf>.

‘smarter patent laws’.³⁷ However, the politicization of the U.S. patent issues makes it difficult, if not impossible, for Congress to sufficiently change the system so as to curb the practice of PAEs.³⁸

IX. – The forthcoming unitary patent and the unified patent court might increase the risk of patent hold-up in Europe

Till now, the European market was not PAEs’ favorite playground. At least, not many high-profile cases have caught the attention of the press and the market observers. But new cases continue to be judged and filed.³⁹ Some academic studies indicate that the practice of patent extortion might exist, for instance on the UK market or in certain sectors.⁴⁰ In an academic study (entitled *Is There a Patent Troll Problem in the UK?*⁴¹), C. Helmers, B. Love and L. McDonagh conclude that NPEs are responsible for 11% of all patent suits filed in the UK between 2000 and 2010.⁴² IPNav, one of the most litigious NPEs in the U.S., considers that the German litigation system has some advantages over the U.S. system: bifurcation between the infringement and revocation actions, speed, limited discovery and expertise of judges.⁴³ The founder of IPNav is also looking forward to the arrival of the new patent system in Europe.

On the other side, a number of large companies (including Adidas, Deutsche Telekom, Apple, Google and Microsoft) expressed the fear that the advent of the unitary patent and in particular the establishment of the Unified Patent Court

³⁷ See <https://www.techdirt.com/articles/20130214/14351821988/president-obama-admits-that-patent-trolls-just-try-to-extort-money-reform-needed.shtml>.

³⁸ See the recent analysis of the patent reform by B. KAHN, “Inside Views: The Politicization Of The US Patent System, Intellectual Property Watch”, 25 August 2014, available at <http://www.ip-watch.org/2014/08/25/the-politicization-of-the-us-patent-system/>.

³⁹ For instance on 28 February 2014, the Mannheim Regional Court dismissed IPCom’s two lawsuits against Apple and one against HTC concerning SEPs for mobile technology. IPCom had claimed €1.6 billion in damages from Apple. IPCom is a German-based NPE that acquired Bosch’s wireless patent portfolio in 2007. On 10 March 2014, Unwired Planet announced that it sued Google, HTC, Huawei and Samsung in London and Düsseldorf alleging infringement of patents related to wireless communications (<http://investor.unwiredplanet.com/releasedetail.cfm?ReleaseID=831483>). Unwired Planet acquired nearly 2,000 patents from Ericsson in January 2013, most of which cover mobile communication technology. LG was later added to the German litigation (press release of 9 May 2014).

⁴⁰ See the outcome of the Study on *The Changing Role of Intellectual Property in the Semiconductor Industry – including on non-practicing entities*, May 2014, conducted for the European Commission (<https://ec.europa.eu/digital-agenda/en/news/changing-role-intellectual-property-semiconductor-industry-including-non-practising-entities>).

⁴¹ Dated 26 September 2013, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2331543.

⁴² This study underlines that “NPEs litigating in the U.K. overwhelmingly assert high-tech patents – even more so, in fact, than their U.S. counterparts – despite higher barriers to software patentability in Europe. [...] We see evidence that the U.K.’s loser-pays legal regime deters NPEs from filing suit, while at the same time encouraging accused infringers to defend claims filed against them. U.K. NPE suits are initiated by potential infringers more often than by NPEs; rarely end in settlement; very rarely end in victory for NPEs; and, thus, result in an attorney’s fee award to the potential infringer more often than a damages award or settlement payment to the patentee. Together, these findings [...] may serve to quell concerns that Europe’s forthcoming Unified Patent Court will draw NPEs to Europe”.

⁴³ See the interview of E. Spangenberg, the founder of IPNav, in *Intellectual Asset Management Magazine*, December 2013 available at <http://www.iam-magazine.com/blog/Detail.aspx?g=13d9bebe-7bf7-492b-86e0-65bf21a1598c>.

(or UPC)⁴⁴ could make patent assertion more attractive and profitable in Europe.⁴⁵ As the new patent system will take time to be operational,⁴⁶ the risk of PAEs on the European soil remains remote (not before 2016). The first argument of those companies has to do with the increased leverage of the patent injunctions: it will indeed be possible to obtain a legal injunction valid on a large market (at least 13 Member States, including Germany, France and the United Kingdom). Today, court injunctions in principle are only granted for a single country (no cross-border effect). But does the ‘sword of Damocles’ of an injunction not already exist under the current system? Can a company that intends to enter the European market succeed if it does not sell on the German market? An injunction valid only in Germany has already a huge impact. Hence, it is not that clear that the leverage effect will be seriously raised in the future. The second concern of those companies relates to the so-called bifurcation system allowing to separate infringement and invalidity proceedings (already known in Germany): will the owners of weak patents have the potential to obtain injunctions in an infringement proceeding well before defendants have an opportunity to revoke the patent in suit? The risk of this ‘injunction gap’ is partly addressed in the options offered to the UPC (*see* art. 33(3), UPC Agreement). But it remains true that the local or regional division has the discretion to suspend the infringement action or let it proceed.⁴⁷

It is thus not clear whether such fears are well founded. The Commission at least fails to see how the new patent system could increase the activity of PAEs: to a question from a Member of the European Parliament, Mr. Barnier, Commissioner in charge of the Internal Market under the presidency of Mr. Barroso, responded that “the UPC as a common specialized patent court will increase legal certainty, and a centralized patent revocation procedure will leave less room for ‘patent trolls’ to exploit current fragmentation”.⁴⁸ In

⁴⁴ Two European instruments delineate the future European patent with unitary effect: Regul. 1257/2012 of 17 December 2012 *implementing enhanced cooperation in the area of the creation of unitary patent protection* (OJEU, no. L. 361/1, 31 December 2012) and Regul. 1260/2012 on *the applicable translation arrangements* (OJEU, no. L. 361/89, 31 December 2012.). The entry into force of those two instruments is subordinated to the entry into force of the Agreement on a Unified Patent Court (2013/C 175/01), an international Treaty signed on 19 February 2013.

⁴⁵ See the first Industry Open Letter of 26 September 2013 (https://docs.google.com/file/d/0Bw8Krk_Q8UaEd3U1dUJ3SVp6LTQ/edit) and the second one of 25 February 2014 (<http://fr.scribd.com/doc/209104430/25-February-2014-UPC-Industry-Coalition-Open-Letter>).

⁴⁶ It is now expected that the Unified Patent Court (UPC) will not be operational before 2016. Doubts even remain in certain circles and countries about the possibility to have the required ratifications of the Agreement on the UPC. As the UK has to ratify the Agreement for the latter to come into force (*see* Art. 89 of the UPC Agreement), the entry into force of the UPC system ultimately depends on the referendum on EU membership that the UK Prime Minister has promised.

⁴⁷ See the analysis of patent litigators: Bifurcation of European patent litigation: a practitioners’ perspective, on *IPKat*, 12 March 2013 (<http://ipkitten.blogspot.be/2013/03/bifurcation-of-european-patent.html>).

⁴⁸ Answer of Mr. BARNIER to a question from Mr. TARABELLA, 8 January 2014 (E-0122000/2013).

addition, Mr. Barnier stressed that no automatic injunctions will be granted because the UPC must weigh the parties' interests and take into account the potential harm from the grant/refusal of the injunction. As litigators know, such balancing is always difficult to predict, and this uncertainty contradicts the apparent increased certainty resulting from the setting-up of a common patent Court (we can also suspect the Commission to be too complacent about the common system it has been advocating for years).

The still to be finalized Rules of Procedure for the UPC⁴⁹ might include other safeguards that could largely respond to the concerns relating to injunctions and bifurcation: a requirement to have 'reasonable evidence' that the patent is valid and infringed before granting a preliminary injunction; the obligation to post an 'adequate security' for any injury likely to be caused to the alleged infringer if the injunction is later revoked; the obligation for the UPC to stay the proceedings in case of high probability that the patent will be held invalid; etc.

A final assessment of the PAEs risk in Europe would have to take into account those Rules of Procedure, as well as the practice of the UPC divisions.

X. – Additional economic arguments on PAEs

Many observers disapprove the actions of PAEs because they assimilate their business model to judicial 'blackmail'. Yet, PAEs also have their proponents, who consider that these companies do nothing wrong: they simply enforce a legal right that they own.⁵⁰ PAEs may also contribute to make the market for patents more liquid and more efficient. There are indeed two main reasons as to why markets for patents work badly. First, many uncertainties surround the value of patents; this is mainly because patents are idiosyncratic (and escape thus any type of metrics) and because they often need to be combined with other patents to create any value. Second, search costs are very high; that is, potential buyers and sellers have a hard time to find the right trading partner on the other

⁴⁹ The 16th (!) version of the draft Rules of Procedure was released on 6 March 2014 (see <http://www.unified-patent-court.org/news/72-revised-16th-draft-of-the-rules-of-procedure>).

⁵⁰ This is still a common view in the U.S. where certain property rights tend to be immune, if not sanctified. Paul Michel, a former chief judge of the U.S. Court of Appeals for the Federal Circuit, the top patent Court, recently expressed this opinion: "I don't understand why it should be illegal for (someone), if he owns a patent, to seek an injunction against an accused infringer" (quotation from his intervention on 25 March 2014 at the GCR Live IP & Antitrust Conference, Washington DC, see <http://globalcompetitionreview.com/events/1637/gcr-live-ip-antitrust-usa/>). In countries that have a developed doctrine of 'abuse of right', the Courts might more easily control the exercise of a property right.

side of the market. PAEs, as their proponents argue, may help solving these market failures.⁵¹

The smartphone patent wars seem to come to an end. The patent truces signed by the main adversaries in 2014 are a sign that the most aggressive phase of those wars is behind us. Also the April 2014 decisions of the European Competition Authority (DG Competition) somewhat delineate the anti-competitive conducts when seeking injunctions before the Courts. This in turn might curb the practice of enforcing SEPs in Europe. The U.S. however is likely to remain a battleground: the global settlement between Apple and Samsung does not apply to the U.S., neither do the restrictions imposed by DG Competition. More importantly, the specificities of the U.S. patent litigation system, combined with the size and relevance of the market, will continue to attract litigants, including the patent trolls.

In the mid-term (2016?), the entry into force of the Unified Patent Court might activate aggressive patent litigation strategies in Europe (we bet this risk will affect other markets than the smartphone sector. One likely candidate is the automotive industry as more and more patented technologies and software are integrated in the cars).

Aggressive patent litigation has clearly a cost for the parties involved. It is also a burden for the administration of justice. It might deter small players to enter the market and thus affect the prices to the detriment of consumers. The practice of PAEs might reduce the diffusion of innovation. Innovation, or more precisely its deployment (rather than its generation), is thus under threat. At the same time, PAEs to a limited extent may solve some market failures. That said, the costs they generate arguably far exceed their benefits. To curb the bad practice in the field of litigation, the patents should be of high quality and the scope of the innovator's rights should be as clear as possible. To ensure that high quality and well-defined entitlements are granted remains a challenge for the patent system.

⁵¹ For a description of intermediation in patent markets, see A. HAGIU and D. YOFFIE, "The New Patent Intermediaries: Platforms, Defensive Aggregators, and Super-Aggregators", *Journal of Economic Perspectives*, 27, 2013, pp. 45-66. For an empirical study of how the market for patents affects the enforcement of patent rights, see A. GALASSO, M. SCHANKERMAN and C. SERRANO, Trading and Enforcing Patent Rights, *Rand Journal of Economics*, 44, 2013, pp. 275-312.