

# EX-POST LIABILITY RULES: WHEN SHOULD THEY BE USED?

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## Introduction

*“The operations of patent sharks sometimes compel an inventor to obtain patents for articles which are never meant to be placed on the market. A fellow often gets up a machine, and somebody else comes along, and by getting patents through for certain parts, can give the inventor a great deal of bother and make him pay well, even if the inventor gets control of it”<sup>1</sup>*  
Thomas Edison, 1898

Strategic behavior and hold-ups are, in general law and economics, a key reason for the use of liability rules<sup>2</sup>. A legal overview of patent law confirms that there is a rather ample space for the use of *ex-post* liability rules<sup>3</sup> across different jurisdictions, especially to deal

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<sup>1</sup> Interview in Scientific American 78 (2): 19. Available at <http://www.myoutbox.net/posa78n.htm>; last accessed on March 20, 2009. See also James McDonough, *The Myth of the Patent Troll: An Alternative View of the Function of Patent Dealers in an Idea Economy*. EMORY LAW JOURNAL, Vol. 56, p. 189 (2006) available at SSRN: <http://ssrn.com/abstract=959945>, describing Thomas Edison as a “king of trolls” in a recent article defending the business model of trolls: “For decades, this person held the U.S. record for the number of patents held by an individual – an astounding 1,093. This person primarily “described himself as an inventor,” and although many of his inventions were incorporated into products, he made a fortune from many patents that he never practiced. Not only did this man not practice nor have any intention of practicing many of his inventions, but he actually invented items specifically to deter innovation. This king of trolls was none other than Thomas Edison”.

<sup>2</sup> For the general concepts of transaction costs and holdups and their application to the patent area see FEDERAL TRADE COMMISSION (October, 2003), *To Promote Innovation: The Proper Balance Between Competition and Patent Law and Policy*, available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf>; Mark Lemley and Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 Tex. L. Rev. 1991, (2007) and Thomas Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses* (Minnesota Legal Studies Research Paper No. 08-39, 2008), available at SSRN: <http://ssrn.com/abstract=1273293>.

<sup>3</sup> The term *ex post* means that the liability rule is not established *ex-ante* by the law but applied *ex-post* by a court or administrative agency. This type of liability rule is also applied *ex post* with regards to the decisions taken by the patent owner of investing in R&D and filing a patent and the decisions by the alleged infringer of using such patented technology, so that when such decisions are taken both the patent owner and the potential infringer do not know if the patent will be protected by a property or a liability rule. See also Dan Burk, *Property Rules, Liability Rules and Molecular Futures: Bargaining in the Shadow of the Cathedral*, in *Gene PATENTS AND CLEARING MODELS: FROM CONCEPTS TO CASES*, Cambridge UK, Cambridge University Press (forthcoming), making the point that any property or liability rules regime might be “determined by clear *ex ante* rules, or it may be determined *ex post*, after a taking, according to flexible standards”. But see the Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, World Trade Organization Agreement, Annex 1C, available at: [http://www.wto.org/english/tratop\\_e/trips\\_e/t\\_agm0\\_e.htm](http://www.wto.org/english/tratop_e/trips_e/t_agm0_e.htm) (hereinafter the TRIPS Agreement), Article 31, which mandates that patent compulsory licenses are subject to the requirement any such authorization “shall

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with such cases of strategic behavior. Nevertheless many law and economics scholars continue to disagree about whether transaction costs and holdups in the context of patented technologies constitute market failures and the frequency and importance of high transaction costs and strategic behavior, among other controversial points. Moreover, the patent economics literature has largely confined the problem of strategic behavior to the specific case of patent hold-ups while directing most of its attention to the even more narrow study of entities such as “patent trolls” rather than to patent strategic behavior in general.

In this paper, I argue that such extremely narrow view is one reason for the vast discrepancy with regards to the convenience of using patent liability rules. Additionally, the majority of law and economics contributions have focused on U.S. law and practice, in noticeable contrast with the overly importance of international patent harmonization. This paper seeks to contribute to these debates by confronting the above mentioned economic insights, which constitute the theoretical grounds for applying *ex-post* liability rules with case studies arising from recent patent discussions in the U.S. and Europe. Whereas such case studies are confined to particular cases, they demonstrate the variety of forms in which patent strategic behavior might arise. Moreover, these variegated forms also incline the balance towards the use of standards for applying liability rules and against the development of rigid rules for their use.

The paper is structured as follows. The first section addresses the problem of patent hold-ups and patent strategic behavior from the perspective of specialized economics literature. The second section discusses the *eBay* and subsequent litigation within the U.S. as a case study of patent hold-ups and strategic behavior. The third section refers to an even broader context for patent strategic behavior as recently described in the European context. The fourth section examines the problems raised both in the U.S. and Europe while drawing policy conclusions in favor of focusing the discussion on the conduct rather than on the nature of the entity engaging in strategic behavior as well as proposing a concept of strategic behavior broad enough to encompass potential socially inefficient behavior and yet, narrow enough to avoid distorting innovation incentives.

### 1. Liability rules and strategic behavior

The categorization of legal entitlements into property and liability rules<sup>4</sup> builds upon the concept of transaction costs and the relative circumstances in which each rule prevails in

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be considered on its individual merits”. Hence it seems that any compulsory license for patents would fall under this category –perhaps with the exception of public based compulsory licenses- whereas the *ex-ante* category will mainly involve copyright statutory licenses.

<sup>4</sup> See Guido Calabresi & Douglas Melamed, *Property Rules, Liability Rules and Inalienability: One View of The Cathedral*, 85 HARVARD LAW REV., 1972. Summing up the burgeoning literature on property and liability rules that began with the C&M article would go beyond the scope of this study. Hence, this section presents a brief summary of the propositions that directly affect the choice between property and liability rules in the area of patent law. For a survey on the property and liability rules literature see Matteo Rizzolli, *The Cathedral: An Economic Survey of Legal Remedies* (January 2008), available at SSRN: <http://ssrn.com/abstract=1092144>

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different law fields<sup>5</sup>. Protecting a right through a property rule means that nobody can use or acquire such right without prior permission of its owner and thus, that a previous negotiation must take place<sup>6</sup>. Hence, the owner of an entitlement protected through a property rule will obtain a mandatory order to stop infringement or an injunction in case of infringement. Conversely, a liability rule protects entitlements but permits non-authorized use or taking in exchange for compensation. Hence, if an entitlement is protected through a liability rule, the relevant authority would fix a compensation to be paid to the owner.

The framework of property and liability rules has been extended, redefined and applied to multiple legal contexts<sup>7</sup>. Beyond its descriptive implications, the categorization has been highly influential and controversial at a normative level. An initial normative suggestion was that a property rule would be superior to a liability rule when transaction costs are low whereas a liability rule might be preferable when there are high transaction costs<sup>8</sup>. The latter situation is frequently found when there are multiple relevant parties with whom to bargain, risks of strategic bargaining, including hold-ups and high monitoring or enforcement costs of any possible agreement. With low transaction costs, parties might bargain between themselves to achieve the most efficient allocation. Conversely, if there are high transaction costs, efficiency requires that the right is allocated to the highest-value user<sup>9</sup>.

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<sup>5</sup> A third instance of entitlements exists in the form of inalienable rights: those for which no trade is allowed. In the patent law field this category might point towards discussion about patentability of certain fields (genes, living organisms, etc). In spite of the importance of this discussion, this paper focuses on alternative protection for alienable entitlements (after issuance of a patent, whether the right-holder should be protected through a right of exclusive or remunerative content). Nonetheless, policy levers that tackle the issues here discussed (enforcement, exceptions) are in some instances related to those used to deal with inalienability of rights (patentability requirements) insofar as policy-makers also have to decide about the convenience of assigning or not a property right in the first place. In this sense, liability rules can be viewed as a middle ground solution between full right (under a property rule) and no right (under an inalienability rule that would follow from a finding of invalidity or non-infringement).

<sup>6</sup> See Calabresi and Melamed *supra* note, using the word "entitlement" to refer to any conflicting situation in which the State has to decide who shall prevail, i.e. who is entitled to prevail. Such decision is called of "first order" since it is the necessary premise for the actual enforcement. The "second order" decision regards the way of protecting the entitlement, e.g. through a property rule, a liability rule or an inalienability rule. Efficiency, they argued, "asks that we choose the set of entitlements which would lead to that allocation of resources which could not be improved in the sense that a further change would not so improve the condition of those who gained by it that they could compensate those who lost from it and still be better off than before", that is, an application of the concept known as Pareto efficiency.

<sup>7</sup> See for instance, Richard Epstein, *A Clear View of The Cathedral: The Dominance of Property Rules*, 106 YALE L.J. 2091, 2093-96 (1997); Carol Rose, *The Shadow of The Cathedral*, 106 YALE L.J., 1997, 2175-2200; Louis Kaplow and Steven Shavell, *Property Rules versus Liability Rules: An Economic Analysis*, 109 HARVARD LAW REVIEW, 713-790 (1997) and Ian Ayres and Eric Talley, *Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade*, 104 YALE LAW JOURNAL, 1027-1117 (1995), among others.

<sup>8</sup> See Calabresi and Melamed *supra* note. However, they not only considered transaction costs and efficiency as normative thresholds but also discussed distributive concerns and notions of fairness that guide the choice between entitlement protection rules.

<sup>9</sup> RICHARD POSNER, *ECONOMIC ANALYSIS OF LAW* (1972), 1st Ed, Boston, Little Brown, p. 29 arguing that: "Where transaction costs are high, the allocation of resources to their highest-valued uses is facilitated by denying

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The problem of hold-outs has been a typical justification for takings of private property under the power of eminent domain<sup>10</sup>. A hold-out might arise whenever the owner of a property right in general, delays or refutes a transaction given that it is the sole authorized to voluntarily agree to any use or transfer. A hold-up may be considered as a specific variant of holdouts, wherein specific investments which constitute sunk costs, have been made by a firm, so that it becomes susceptible of being held-up by a trading partner in a bilateral monopoly due to such specific investments<sup>11</sup>. While transaction costs have been proposed as a workable threshold to decide upon whether a property or a liability rule is more efficient, the same concept of transaction costs might encompass different types of costs which might be more or less relevant in different contexts. A typical categorization of transaction costs distinguishes between costs due to the number of parties and difficulty of ex-ante negotiations on one hand and costs due to strategic bargaining, including hold-ups and hold-outs on the other<sup>12</sup>.

Many scholars have developed the above mentioned insights and suggested different extensions and critics. In particular, the property and liability rules framework has been applied to the patent field with controversial results. This paper focuses on the particular costs caused by strategic behavior of the parties that might preclude efficient bargaining in the specific context of patent law.

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property right holders an injunctive remedy against invasions of their rights and instead limiting them to a remedy in damages”.

<sup>10</sup> See Thomas Miceli & Kathleen Segerson, *Takings*, in *ENCYCLOPEDIA OF LAW AND ECONOMICS*, available at <http://encyclo.findlaw.com/6200book.pdf> at p. 330, claiming that “when the government is assembling a large amount of land to build a public project like a highway, individual owners whose land is necessary for the project acquire monopoly power in their dealing with the government. That is, they can **hold out for prices in excess of their true (subjective) valuation** of the land given that it would be costly, once the project is begun, for the government to seek alternative locations” (emphasis added). Although the terms hold-out and hold-up are often used interchangeably, in the context of patents the literature refers mostly to hold-ups.

<sup>11</sup> See Epstein, *supra* note at p. 2092 explaining that “The standard practice in virtually all legal systems assumes the dominance of property rules over liability rules, except under those circumstances **where some serious holdout problem is created because circumstances limit each side to a single trading partner. In these cases of necessity**, the holdout problem could prove enormous, so that the strong protection of a property rule is relaxed” (emphasis added). Whereas hold-outs, as Epstein explains might only create problems under special circumstances that limit “each side to a single trading partner”, this will always be the case in a hold-up, which could be viewed as a type of hold-out where parties are in a bilateral-monopoly due to their specific investments, and it is thus a case calling for some type of intervention. See also Yeon-Koo Che & József Sákovics, *Hold-ups* in *THE NEW PALGRAVE DICTIONARY OF ECONOMICS*, Second Edition (2008, Edited by Steven N. Durlauf and Lawrence E. Blume), explaining that “hold up arises when part of the return on an agent's relationship-specific investment is ex post expropriable by his trading partner”.

<sup>12</sup> See e.g., Rose, *supra* note (dividing transaction costs into type I and type II errors, which correspond to these two groups of costs). See also Mark Lemley and Philip Weiser, *Should Property or Liability Rules Govern Information?* 85 *TEXAS LAW REVIEW*, 4, March 2007, p. 783-841, at p. 787, (adopting a similar categorization of transaction costs while arguing that the strategic use of injunctions is a particular transaction cost that “reflects the fact that certain conditions -including legal certainty-can increase the value of an entitlement and make a holdout strategy rational”).

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**1.1. Patent Hold-ups: economic theory**

Patent hold-ups can be said to impose losses in terms of static efficiency which are not sufficiently offset by expected dynamic efficiency gains in terms of innovation incentives as well as losses in terms of dynamic efficiency in the sense of blocking efficient subsequent innovations<sup>13</sup>. Nevertheless, important divergences subsist among scholars with respect to the actual effects of hold-ups on efficiency. Even in a general non-patent context, some authors have argued that bilateral hold-ups are not necessarily inefficient but would rather impose only distributional concerns. On the contrary, it is largely acknowledged that inefficiencies do arise when negotiations are multilateral<sup>14</sup>.

Hold-ups have been mainly studied in the context of incomplete contracts, when a party making specific investments is prone to opportunistic behavior by its counterpart in a contract. Specific investments are those that cannot be easily or at all translated into another useful use, hence, a firm making specific investments which constitute sunk costs becomes a potential target for strategic or opportunistic behavior<sup>15</sup>. The rational response to the risk of opportunistic behavior would range between the use of contracts and vertical integration between firms<sup>16</sup>. However, as explained with more detail below, it is doubtful that contracts might avoid all risks of strategic behavior<sup>17</sup>.

Translated outside the realm of contracts, the risk of opportunistic behavior might arise whenever a party makes a specific investment. When the problem is subsequently applied to the patent context, which is characterized by an increasing prevalence of transaction costs and complex negotiations that frequently fail, the potential risk of being exposed to opportunistic behavior, including hold-ups is even greater.

In the patent context, specific investments are usually made by 2<sup>nd</sup> innovators in the development of products that embody some patented technology, either in the form of an improvement of a previous patented technology or through its incorporation in a multi-component product. If *ex-ante* negotiations for a license fail, or, as it has been recently argued, do not happen because of problems in the disclosure and notice function of patents, many innovators might refrain from making such specific investments in the fear of being held-up, and hence many technological improvements or new products might not come into existence or might be inefficiently delayed<sup>18</sup>.

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<sup>13</sup> See Cotter *supra* note.

<sup>14</sup> See Cotter, *supra* note at footnotes 60-61 and accompanying text, citing from Lloyd Cohen, *Holdouts*, in 2 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 239 (1998).

<sup>15</sup> See Benjamin Klein, Robert Crawford and Armen Alchian, *Vertical Integration, Appropriable Rents, and the Competitive Contracting Process*, 21 J. LAW & ECON. 297 (1978), at p. 298 explaining that: "when a specific investment is made and such quasi-rents are created, the possibility of opportunistic behavior is very real".

<sup>16</sup> *Ibid* at 298, arguing that: "as assets become more specific and more appropriable quasi rents are created (and therefore the possible gains from opportunistic behavior increases), the costs of contracting will generally increase more than the costs of vertical integration".

<sup>17</sup> See Shapiro & Lemley, *supra* note.

<sup>18</sup> See Cotter, 2008, *supra* note, at p. arguing that such dynamic efficiency losses might follow especially because of the following reasons: (1) Although the patent system aims at enabling patentees to profit and

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A specific case of hold-ups might arise in the case of the negotiation of technical standards comprising several patented technologies. These cases are increasingly important in today's world as technical standards have become ubiquitous and of especial value for industries relying on compatible products and the use of networks and interfaces. When negotiations for the implementation of technical standards take place, it is important for all firms to know which patent(s) are essential for the use of such standard. Any firm making specific investments in developing a product according to the standard could be otherwise subject to opportunistic behavior if disclosure does not take place before the development of the product. In fact, the adoption of a standard reduces the available options *ex ante* in the sense that once the standard is set and the industry decides to abide to such standard, the involved patents would acquire a value they did not have before. Such value is not inherent to the technology but rather derives from the specific investment made by firms in developing their products in accordance to such standard.

Hence, whereas avoiding the use of the patent is not costly *ex-ante*, it will be very costly after the standard is set. The adoption of contractual terms such as FRAND or RAND<sup>19</sup> precisely attempt to solve through a contractual commitment, the potential emergence of strategic behavior<sup>20</sup>. However, it is still unclear that such contractual commitments might completely avoid hold-ups as it is precisely in the context of SSO's (Standard Setting Organizations) negotiating technological standards that some firms have lately refused to abide to previously adopted commitments to license<sup>21</sup>.

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extract rents from their patented inventions, it is doubtful that extracting rents from hold-ups will benefit society in terms of providing more incentives for 1<sup>st</sup> innovators, especially if the costs of such greater capture are taken into account; (2) 2<sup>nd</sup> innovators are not merely users of technologies but rather innovators and the patent system does not only aim at fostering 1<sup>st</sup> innovations but also at the development of useful new applications and improved technologies; (3) The complement characteristic of many patented technologies might lead to the problem of Cournot complements by which the final product is priced above its social optimal and (4) Hold-ups might also add up to the losses due to a double marginalization problem, when both upstream innovator and downstream user are monopolists and as a consequence net social benefits will be lower.

<sup>19</sup> These almost equivalent terms describe licensing commitments adopted in the context of negotiated technical standards standing for a promise to license on Reasonable and Non-Discriminatory (RAND) and Fair, Reasonable and Non-Discriminatory (FRAND).

<sup>20</sup> See Joseph Scott Miller, *Standard Setting, Patents, and Access Lock-in: RAND Licensing and the Theory of the Firm*, 40 IND. L. REV. 351, 366-67 (2007), arguing that: "The holdup plays on a gap in projected returns that depends on continued access to the standardized technology: once the standard is set, users invest in making goods and services that use the specification. If a user were then denied access to the standard technology and the standard-compliant assets were sold at salvage value, the return on those investments would be far lower than first projected (when continued access was assumed) (...) This scenario is not unique to the standards setting context. Economists have long called the problem "asset specificity." The RAND promise, which is an early agreement on the framework for later negotiation, is timed to take advantage of the tempering effect of the veil of ignorance and is designed to prevent this holdup problem".

<sup>21</sup> See Pat Treacy and Sophie Lawrance, *FRANDly fire: are industry standards doing more harm than good?* JOURNAL OF INTELLECTUAL PROPERTY LAW & PRACTICE, 2008, Vol. 3, No. 1, commenting on various cases including the Rambus and Qualcomm cases in the U.S. as well as the investigation by the European Commission and other cases in Germany and the U.K.

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The strategic behavior arising in this context that illustrates the closely interface between antitrust and patent policy is often known as “patent ambush”<sup>22</sup>. This conduct can be defined as a sub-type of patent hold-up that occurs in the context of negotiations for technological standards within an SSO when a member of such organization misleads other members into the adoption of a standard that is or will be covered by a patent or patents that was not disclosed at that time<sup>23</sup>. The conduct consists in deceiving other members or in keeping patents hidden until the standard is set and lock-in occurs. In this sense, a patent ambush is a form of hold-up insofar as investments are sunk and SSO members are locked into the standard. Often, an entity engaging in patent ambush makes use of other patent filing strategies, for instance, the filing of continuation or divisional applications in order to deceive; or else keeps its patent hidden until the standard is set<sup>24</sup>.

The practice of filing continuation applications is in fact recalled as the key reason that allowed *Rambus* to maintain its patent secret until the DRAM standards were developed<sup>25</sup>. Additionally, in some cases such as *Rambus* itself -where after a long procedure that extended over 9 years the EPO decided to revoke *Rambus*' patent- the involved patents might be of dubious validity<sup>26</sup>. Similar cases have been tackled either through the application of antitrust law, equitable defenses against enforcement of such patents or the application of unfair competition laws, illustrating the complementary nature of such statutes<sup>27</sup>.

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<sup>22</sup> Whereas an ambush is often referred as a conduct rather than the entity that practices it, this latter is often assimilated to a “troll”. For a description of the role of SSO's in the modern patent system see Mark Lemley, *Intellectual Property Rights and Standard-Setting Organizations* (Boalt Working Papers in Public Law, Paper 24), available at: <http://repositories.cdlib.org/boaltwp/24>. For the problem of hold-ups in the standard setting context see Cotter, 2008, supra note and Lemley and Shapiro supra note. For divergent view see Miguel Rato & Damien Geradin, *Can Standard-Setting Lead to Exploitative Abuse? A Dissonant View on Patent Hold-up, Royalty Stacking and the Meaning of FRAND*, 3 EUR. COMPETITION J. 101, 107 (2007).

<sup>23</sup> See Cotter, 2008 at p. 43.

<sup>24</sup> See Herbert J. Hovenkamp, *Patent Continuations, Patent Deception, and Standard Setting: The Rambus and Broadcom Decisions*, University of Iowa Legal Studies Research Paper No. 08-25 (June 2008), at 28-29, available at <http://ssrn.com/abstract=1138002>

<sup>25</sup> DIETMAR HARHOFF ET AL., *The strategic use of patents and its implications for enterprise and competition policies*, Tender for No ENTR/05/82, FINAL REPORT - JULY 8, 2007 at p. 95-96. Whereas the FTC found that Rambus had “unlawfully monopolized the markets for four computer memory technologies that have been incorporated into industry standards for DRAM chips”, the Court of Appeals decided for...Information on the case Docket No. 9302 *In the Matter of Rambus Incorporated* is available on: <http://www.ftc.gov/os/adjpro/d9302/index.shtm>

<sup>26</sup> See HARHOFF ET AL, supra note footnote 47 and accompanying text. See also press release by EPO, informing about the revocation of patent 0525068 available at: <http://www.epo.org/about-us/press/releases/archive/2004/12022004.html>, last accessed on August 13, 2009. However, the patent remains enforceable, for instance in Italy: [http://v3.espacenet.com/publicationDetails/inpadoc?CC=EP&NR=0525068A1&KC=A1&FT=D&date=19930203&DB=EPODOC&locale=en\\_EP](http://v3.espacenet.com/publicationDetails/inpadoc?CC=EP&NR=0525068A1&KC=A1&FT=D&date=19930203&DB=EPODOC&locale=en_EP)

<sup>27</sup> See Thomas Rosch, *Remarks before the Newport Summit on Antitrust and Economics*, 2008 WL 2312363 (F.T.C.) referring the case of Negotiated Data Solutions LLC, FTC File No. 051 0094 (Consent Accepted For Public Comment, January 23, 2008), available at <http://www.ftc.gov/opa/2008/01/ethernet.shtm> (“N-Data”) whereby N-Data acquired patents held by National Semiconductor Corporation in the knowledge that this latter had made a one-time \$1,000 licensing commitment. The Commission applied Section 5 of the FTC Act,

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Summing up, the risk of being held-up can occur either in a bilateral or in a multilateral context, and within or outside negotiations of technical standards. In all these cases, incentives for 2<sup>nd</sup> innovators might nevertheless be affected. However, the disagreement of scholars over the economic effects of hold-ups is even more acute in the case of patents.

### 1.2. Economics of patent hold-ups: the Lemley and Shapiro model

Different economic models have been used to illustrate the problem of patent hold-ups. The typical economic model foresees a patentee (1<sup>st</sup> innovator) that develops a technology which is incorporated in a downstream product by a potential infringer (2<sup>nd</sup> innovator)<sup>28</sup>. By the time a 2<sup>nd</sup> innovator develops the downstream product that infringes on the patented technology -at some cost- she might either be unaware that such technology is patented or might have doubts with regards to whether her product infringes the technology<sup>29</sup>. Parties might negotiate *ex-ante* for a license, but if those negotiations fail, the patentee sues the 2<sup>nd</sup> innovator.

In the model used by Lemley and Shapiro, the outcome of negotiations would depend among different variables:

-*V* is the value of the patented feature to the downstream firm in comparison with the next best alternative technology.

-*M* is the margin earned by the downstream firm on its product.

-*θ* is the strength of the patent which reflects the probability that the patent is found to be valid and infringed by the downstream firm's product.

-*C* is the cost to the downstream firm of redesigning its product in order to avoid infringing the patent claims.

-*L* is the fraction of the downstream firm's total unit sales during the lifetime of the patent that would be lost if the downstream firm were forced off the market by an injunction.

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alleging that N-Data's conduct was an unfair method of competition and an unfair act because after the industry committed to the related standard N-Data refused to license in the above mentioned terms and demanded a higher royalty. See also the Statement of the Federal Trade Commission, In the Matter of Negotiated Data Solutions LLC, FTC File no. 051 0094 at 5-6, available at <http://www.ftc.gov/os/caselist/0510094/080122statement.pdf>, arguing that: "in the standard-setting context with numerous, injured third parties who lack privity with patentees and with the mixed incentives generated when members may be positioned to pass on royalties that raise costs market-wide contract remedies may prove ineffective, and Section 5 intervention may serve an unusually important role".

<sup>28</sup> See Lemley and Shapiro *supra* note. See also critics by Denicolo, V., D. Geradin, A. Layne-Farrar, and J. A. Padilla (2008, September). *Revisiting injunctive relief: Interpreting ebay in high-tech industries with non-practicing patent holders*. *Journal of Competition Law and Economics* 4 (3), 571-608 and Einer Elhauge, *Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?* (July 22, 2008, Harvard Law and Economics Discussion Paper No. 614), available at SSRN: <http://ssrn.com/abstract=1139133>.

<sup>29</sup> The reasons why a firm designs a product using a patented invention range from willful infringement to independent invention and might be as well affected by the confluence of patent strategies including delays in publication, filing strategies including the modification of patent applications to include the infringing product, the file of divisional applications or continuations with important differences from the previous patent that might deceive 2<sup>nd</sup> innovators or the case in which a 2<sup>nd</sup> innovator is simply unaware of the patent or even if aware, has a reasonable belief that the product is not infringing.

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- $B$  is the bargaining skill of the patent holder, which reflects a fraction of the combined gains from settling, rather than litigating, which are captured by the patent holder.  $B$  has a value from 0 to 1 and is usually assumed to be 0.5 reflecting equal bargaining skills of the parties.

The model developed by Lemley and Shapiro studies how injunctions affect the threat points for parties bargaining over patent royalties and assumes that the bargaining skill of parties " $B$ " remains constant. For the purposes of the analysis, the model needs to refer to a benchmark royalty that would be negotiated in an ideal patent system. Such benchmark, for Lemley and Shapiro, is  $B \times V$  for an ironclad patent, that is, a patent that is certainly or almost certainly valid, whereas the benchmark is  $\theta \times B \times V$  for other patents. The term  $\theta$  discounts the benchmark by the probability that the patent is finally held valid and infringed<sup>30</sup>. Since reasonable royalties are calculated upon the basis of a hypothetical royalty, they argue that this benchmark can also be applicable for the calculation of reasonable royalties. Although they do not normatively argue for the use of such benchmark, they sustain that any rule significantly altering it, might distort patent incentives<sup>31</sup>. Lemley and Shapiro conclude that the threat of injunctive relief for component products causes patentees whose inventions are only one component of a larger product to be systematically overcompensated<sup>32</sup>.

In addition, according to Lemley and Shapiro, the calculations of reasonable royalties should take into consideration the availability of design around or non-infringing alternatives. Whereas courts currently analyze this factor when calculating lost profits, Lemley and Shapiro argue that this factor as well as whether there are unpatented components on the infringing product should also be pertinent for the calculus of reasonable royalties<sup>33</sup>. In this way damages might better reflect the actual contribution of

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<sup>30</sup> See Lemley, Mark A. and Shapiro, Carl, *Probabilistic Patents*, JOURNAL OF ECONOMIC PERSPECTIVES, Vol. 19, p. 75, 2005, available at SSRN: <http://ssrn.com/abstract=567883>, making the point that: "the actual scope of a patent right, and even whether the right will withstand litigation at all, are uncertain and contingent questions". In this sense, patents are probabilistic rights and a value can be assigned to represent the strength of the patent, that is, the probability that once litigated it would not be declared invalid.

<sup>31</sup> See Lemley and Shapiro at p. 2000, arguing that: "we do not mean that the benchmark royalty is the "right price" that should displace the workings of the market. To the contrary, as our use of the Nash bargaining model suggests, we are agnostic on how the cooperative surplus from bargaining is actually divided between the parties. We are, however, concerned to ensure that the law does not change the threat points that set the boundary conditions for this bargaining in ways that systematically move it away from the benchmark. If the law does so, the result, especially for weak patents, is that the patent system has distorted the market allocation of resources"

<sup>32</sup> See Lemley and Shapiro, supra note at p. 2044.

<sup>33</sup> See Lemley and Shapiro, supra note, at p. 2018, explaining that while the case of *Georgia-Pacific v. United States Plywood* 318 F. Supp. 1116 (S.D.N.Y. 1970) enumerated fifteen factors that might be taken into account when simulating the hypothetical negotiation that would have occurred ex-ante; these factors are often reduced to only three significant issues: the significance of the patented invention to the product and to market demand, the royalty rates people have been willing to pay for this or other similar inventions in the industry, and expert testimony as to the value of the patent.

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the patent, an aspect that has been recently highlighted and included in recent Bills proposing a reform of the U.S. patent act<sup>34</sup>.

In spite of presenting a model that underlines a potentially pervasive problem in patent law<sup>35</sup>, Lemley and Shapiro suggest that injunctive relief shall remain the baseline remedy for most patentees. They argue that courts shall nevertheless limit the availability of injunctions in some cases, especially when inventions are only a minor component of a larger product and when the patentee's principal interest in litigating patent infringement is to obtain licensing revenues. Likewise, they suggest that when the cost of redesigning the entire product is high relative to the value of the patented technology, courts shall deny the injunction. Even if such redesign costs are not so large, courts might award a stay in order to allow redesigning while calculating reasonable royalties for the time of such "allowed infringement". They suggest that courts should additionally take into consideration whether infringement was inadvertent as a prerequisite to deny injunctions. Conversely, in cases where the patentee might be granted lost profits, that is, when plaintiff and defendant are competitors, courts shall grant an injunction but might still allow a stay according to the proportion of the value of the patented innovation<sup>36</sup>.

### 1.1.1. Refinements and critics

Many scholarly comments have elaborated and criticized the above mentioned model. In practice, however, most of the dissimilar results and policy suggestions vary in accordance to the assumptions considered necessary in order to find a hold-up as well as whether such conditions are deemed to be more or less frequent in practice.

For instance, according to Cotter, additional requirements should be retained necessary in order to confine cases of patent hold-ups as much as possible<sup>37</sup>: 1) that the patent contributes only to a portion of some multi-component end product; 2) that the exercise of market power is linked to the possibility that the patentee obtains an injunction preventing commercialization of the multi-component product; 3) that the patentee is not a

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<sup>34</sup> See Cotter *supra* note at p., citing the Hearing Before the Subcomm. on Courts, the Internet, and Intellectual Property of the H. Comm. on the Judiciary, 109th Cong. (2005); H.R. 1908, 110th Cong., 1st Sess., § 5 (2007), available at <http://www.govtrack.us/congress/billtext.xpd?bill=h110-1908&version=pcs>. See also H.R. 1908, 110th Cong., 1st Sess., § 5(a)(3) (2007), which passed the House of Representatives in fall 2007, but was removed in 2008 from the Senate calendar, after an intense lobbying campaign against it.

<sup>35</sup> The assertion that this might be a pervasive problem is not intended to judge on the actual frequency of hold-ups and strategic behavior in patent law, a -difficult- question for empirical studies but it only reflects a known feature about modern technologies where many of them are incorporated in multi-component products "reading on" hundreds and even thousands of patented technologies, for which redesign might be costly either with respect (1) to the value of the infringed patent or (2) ex-post with respect to the cost of ex-ante redesign if the potential infringer was aware of the patent.

<sup>36</sup> Lemley and Shapiro, *supra* note, at p. 2035-2045, providing policy suggestions in the light of patent hold-ups and royalty stacking.

<sup>37</sup> Cotter, *supra* note at p. 23-26.

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competitor of the potential licensee<sup>38</sup> and 4) that a benchmark is found that provides guidance as to when a patentee is extracting a royalty above some reasonable threshold.

The last requirement used to assess whether the royalty extracted by the patentee is above a reasonable threshold has been the source of further disagreement. The ideal benchmark proposed by Lemley and Shapiro, which is  $\beta\theta V$ <sup>39</sup>, means that injunctive relief systematically threatens to over-reward component patent owners, given that it empowers them to bargain for royalties above that threshold. Conversely, Elhauge proposed that the accurate benchmark shall be  $\theta V$ . If this is the correct threshold over-rewarding would occur only in some cases<sup>40</sup>. Cotter has on the other hand argued in favor of using the Lemley and Shapiro's benchmark or at least, accepting that there are more cases where over-rewarding is possible outside of those confined by Elhauge's paper and proposing that the calculation of the threshold should center on  $V$ , which however might also be difficult<sup>41</sup>. In fact, it is suggested that a trade-off exists between the different proposed methodologies to calculate reasonable royalties. One option is theoretically correct in that it reflects the value of the patented technology over the prior art with respect to alternative technologies but this option is administratively costly. The other approach is less costly but might create higher aggregate social costs<sup>42</sup>.

More in general, commentators argue that switching to a liability rule would likely lead to errors and costs in calculating the appropriate royalty, and whereas party-negotiated royalties reflect more accurately the value of innovations, court-calculated royalties would tend to err in the sense of under-compensating patentees. An important counter-argument is that it is however possible that courts might err both in the sense of over-compensating or in under-compensating<sup>43</sup>. As expected, however, scholars do not only disagree about

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<sup>38</sup> But see Cotter adding that: "Of course, there might be mixed cases, in which the patentee competes in some markets and licenses its technology in others; holdup would be a risk in those markets in which the patentee does not compete, and would not be a risk in the others".

<sup>39</sup> The lower the reasonable threshold, the more cases that will be found to be in excess of that threshold and therefore categorized as hold-ups. The term  $\beta$  included in  $\beta\theta V$  represents a measure of the bargaining power of the patent holder, which is a variable ranging from 0 to 1 and usually assumed to be 0.5. Therefore the threshold proposed by Lemley and Shapiro ( $\beta\theta V$ ) would be lower than that proposed by Elhauge, which is not "discounted" with the bargaining power of the patentee ( $\theta V$ ).

<sup>40</sup> See Einer Elhauge, *supra* note.

<sup>41</sup> Cotter, at p. 36. Nevertheless, Cotter questions any distinction between  $\beta\theta v$  and  $\theta v$ , basically because it is not clear how if ever a court could estimate  $\beta$  and points out that when the courts seeks to replicate the hypothetical royalty the parties would have negotiated, they may not take into account the *ex ante* value of  $\theta$ , hence concluding that the fundamental theoretical question about the ideal threshold should be how to estimate the value the parties would have placed on  $V$ , that is, the value of the patented technology. See also next section, arguing in favor broadening the restrictive definition of patent hold-ups in accordance to the threshold proposed by Cotter, which is as well compatible with previous literature in the economics of patent improvement (Merger and Nelson).

<sup>42</sup> Cotter at p. 40.

<sup>43</sup> Cotter at p. 28-29, footnote 119 and accompanying text, indicating that "Indeed, if Lemley and Shapiro's analysis is correct, courts in patent infringement cases sometimes may be more prone to overcompensate in the sense of awarding royalties in excess of those which the parties themselves would have agreed to *ex ante* and citing Lemley & Shapiro, *supra* note and Mark Lemley, *Distinguishing Lost Profits from Reasonable Royalties*, at

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the potential biases of royalties calculated by courts but also about whether the current patent system over-compensates or under-compensates patent holders<sup>44</sup>.

### 1.1.2. Assumptions of the models

An important source of controversy between scholars regards the assumptions followed by each model. For instance, the results of Lemley and Shapiro are said to rely on the following assumptions: (1) Infringement is inadvertent; (2) Infringement is detected with certainty (implicit in their model); (3) It is costly to redesign the product *ex-post* compared with what it would have cost *ex-ante* and (4) The technology has several components and the value of the infringed patent is small compared to the total value of the infringing product<sup>45</sup>. Moreover it has been argued that any policy restricting the availability of injunctive relief should take into account the possibility of errors and any such policy would only be desirable when hold-ups are sufficiently frequent as to call for a change in the baseline rule<sup>46</sup>.

With respect to inadvertent infringement, it has been advanced that a distinction should be made between inadvertent infringement and infringement not implying a mere copying<sup>47</sup>. Assimilating cases in which copying or willful infringement is not proved to inadvertent infringement could be detrimental because it would create incentives to infringe patents. The identification of inadvertent infringement is also difficult and although an inadvertent infringer might be defined as one that after performing a previous reasonable search did not find any relevant patent that would be infringed, it is however debatable that such a previous “reasonable” search by the infringer would suffice

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12-13 (Stanford Public Law and Legal Theory Working Paper Series, Working Paper No. 1133173, 2008), available at <http://ssrn.com/abstract=1133173> claiming that “some patentees who *can* prove lost profits elect instead to seek a ‘reasonable’ royalty that is far in excess [of] what the parties would have negotiated”.

<sup>44</sup> Compare Lemley and Shapiro with Denicolo et al. and Denicolo. Whereas Lemley and Shapiro based their model on the assumption of one-way complementarity, meaning that the product could have been designed without infringing the patent; Denicolo et al. develop a model in which innovations are complementary and find that inventors are likely to be under-compensated and investment would be sub-optimal, given that: “With strictly complementary innovations firm A exerts a positive externality on firm B, and vice versa”. As a consequence, under-compensation occurs since firms exert positive externalities on one another.

<sup>45</sup> See Denicolo et al. at p. 589, arguing that notwithstanding the restrictiveness of their results in the light of these assumptions, Lemley and Shapiro have relaxed such assumptions for the purposes of drawing policy implications, and hence, suggesting that limiting injunctive relief shall only be possible under the above mentioned restrictive assumptions.

<sup>46</sup> See Denicolo et al. at p. 583-584 explaining that: “On the one side is the risk of denying an injunction to a patent holder in the absence of a significant holdup problem, a type 1 (“false positive”) error. On the other side is the risk of granting an injunction to a patent holder who is indeed intent on holdup, a type 2 (“false negative”) error. Different policy rules entail different risks of type 1 and type 2 errors. If injunctions were granted routinely, for instance, type 1 errors would be avoided altogether but the probability of type 2 errors would remain”. They moreover criticize any attempt of developing a categorical rule that systematically denies injunctive relief for non-practicing entities. For the reasons mentioned in the precedent section we agree that such categorical rules might not bring beneficial effects for patent policy.

<sup>47</sup> See Denicolo et al., *supra* note.

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to avoid surprise patents nowadays<sup>48</sup>. However, many recent studies highlight that such a reasonable search is not possible in an important number of cases, making the exception “unless patent search costs are insuperable” to frequently become the rule<sup>49</sup>.

There are additional problems with using a standard of due diligence in order to rule out willful infringement as it happens in the U.S. case<sup>50</sup>. In practice, firms developing innovations in the U.S. would deliberately avoid performing a thorough patent search in order not to read previous patents. Otherwise, when a firm becomes aware of the existence of a patent it will be subject to an obligation to ask an opinion from a patent counsel or risk to be found a willful infringer and potentially be obliged to pay treble damages<sup>51</sup>. More in general, it is clear that a “due diligence” standard shall be subject to the court’s discretion in order to avoid parties behaving strategically with respect to the requirements set by any categorical rule as well as to adapt to future technological events that either facilitate or difficult a previous search on prior art<sup>52</sup>.

Inadvertent infringement that occurs due to the incompleteness or costliness of patent information –even by effect of rules providing wrong incentives- might then produce or aggravate the risk of hold-ups. This would not only suggest that some limitation of injunctive relief might be sometimes needed but would also favor rules allowing the application of compulsory licensing provisions for infringers, at least when they are inadvertent<sup>53</sup>. While a general drawback with limiting injunctive relief for inadvertent

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<sup>48</sup> See Elhauger, *supra* note at p. 14, concluding that infringement can always be avoided because “the downstream firm can (unless patent search costs are insuperable) always assure it pays a royalty rate that does not exceed the true optimal rate” by “simply search[ing] the patent records to avoid surprise and then negotiate a license before designing”

<sup>49</sup> See Cotter at p. 25-26, counter-arguing the difficulty of previous patent searches. See also BESSEN AND MEURER.

<sup>50</sup> See *Re Seagate*, correcting the threshold for willful infringement that was previously applied by the CAFC during the previous years, In fact, giving the punitive nature of enhanced damages, those should be considered as a deterrent mechanism, limited to cases of “recklessness” infringement. But see Cotter, agreeing with the new standard but disagreeing with the underlying analysis that relies on the probability that the patent would be declared valid and infringed instead than on the rate of detection, which is the relevant variable from an economic viewpoint.

<sup>51</sup> See Mark Lemley and Ragesh Tangri, *Ending Patent Law’s Willfulness Game*, BERKELEY TECHNOLOGY LAW JOURNAL, VO. 18. P. 1085, explaining how the willfulness rules create an important incentive for firms to avoid reading patents: “once a company becomes aware of a patent, it has an obligation to obtain a written opinion or risk later being held a willful infringer. To avoid this significant cost, in-house patent counsel and many outside lawyers regularly advise their clients not to read patents if there is any way to avoid it”.

<sup>52</sup> See Richard A. Epstein, F. Scott Kieff & R. Polk Wagner, *Brief of Various Law & Economics Professors as Amici Curiae in Support of Respondent, eBay, Inc. v. MercExchange, L.L.C.*, 2005 U.S. BRIEFS 130 (2006), at p. 591: “Potential infringers would have a palpable incentive to decrease inquiry into existing patent rights, which would in turn increase the number of infringement disputes.” *Ibid*, arguing that: “To avoid those risks, and hence avoid encouraging even greater false positives, it is important that injunction policy require a defendant to establish not only that it infringed inadvertently, but also that it exercised due diligence in searching for any intellectual property right its product might have violated”.

<sup>53</sup> Such possibility is for instance provided in the Italian Code of Industrial Property that allows good faith infringers to apply for a compulsory license. Yet the standard of “good faith infringer” has not been still interpreted by any court in the context of awarding a compulsory license. Whereas it will be difficult to prove

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infringers is to give incentives to infringe patents, it is doubtful that awarding injunctions in cases of “good faith”, “inadvertent” or “innocent” infringement would help to achieve the optimal level of deterrence rather than tilting the balance towards over-deterrence. For the purposes of achieving optimal deterrence, it could be sufficient to consider the prospective of enhanced damages when willful infringement is proved and whether they are large enough with respect to the rate of detection.

A second point of controversy in the above mentioned models regards the rate of detection of infringement<sup>54</sup>. If not all infringement cases are detected, over-compensation may not happen as the compensation shall be weight by the percentage of cases in which detection actually occurs. Indeed the probability of detection is an important variable from the economic viewpoint which is often proposed to optimally adjust the level of retrospective damages<sup>55</sup>. However, courts should also be careful enough to avoid rendering the patentee better off than he would have been without the infringement, or otherwise risk to make the strategy of “being infringed” profitable enough to encourage strategic behavior<sup>56</sup>.

Apart from the rate of detection, another possible variable that should probably be taken into account is the rate of settlement, as any previous agreement between patentee and infringer to put an end to the suit would probably reflect lower royalties than the final outcome discounted by the probability that the patent is found infringed. The effect of settlements might however, be less significant than in other fields due to the fact that a settlement in a patent case also involves the payment of royalties in spite of the probability that the patent could have been considered invalid if the trial continued, with consequences that go beyond the private interests of the parties involved in the trial<sup>57</sup>.

A third debated assumption of the models is the requirement that redesigning the product is costly *ex-post*, and whether the requirement should be that this redesign cost is high

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that either one was not aware of the patent, or that one had a reasonable doubt of the validity of the patent in the light of the presumptions of validity of patents and the public nature of patent documents, however, more often a defense could consist in a reasonable belief that one’s product does not infringe the patent or that the product was designed independently. Although this latter is not an exemption under patent laws it could be useful for the purposes of defining “good faith infringement”.

<sup>54</sup> Whereas the Lemley and Shapiro model seem to assume that every case of infringement is detected, Denicolo et al. criticize this assumption as unrealistic in the light that detection will occur only on a fraction of cases and as creating a problem of potential under-compensation for patentees.

<sup>55</sup> See Denicolo et al. at p. 592, footnote 72. See also Cotter, supra note at p.30, footnote 127 and accompanying text.

<sup>56</sup> See Henkel, Joachim and Reitzig, Markus G., *Patent Sharks and the Sustainability of Value Destruction Strategies* (September 2007), available at SSRN: <http://ssrn.com/abstract=985602>, two inefficiencies identified by scholars in legal practice, namely patentee-friendly injunctions and the granting of excessive damage awards, as drivers of ‘destructive’ strategies put in place by patent trolls or patent sharks that aim at appropriating innovation rents by threatening to patent-block other players’ R&D-related value creation

<sup>57</sup> See Lemley, Mark A. and Shapiro, 2005, supra note 30 noting that patent invalidation is a public good which provides positive externalities to other competitors and hence tends to be under-supplied as well as describing the problems generated by reverse payments whereby patentees pay potential incumbents to drop claims of invalidity, a practice that has been found in the pharmaceutical sector in order to prevent the entrance of generic competitors.

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relative to the value that the patented technology has added to the infringing firm's product<sup>58</sup> or whether it should be that redesign costs are zero *ex ante* and costly *ex-post*<sup>59</sup>.

Critics on the Lemley and Shapiro's model argue that different results hold when the infringed patent is essential for the innovative product. For instance, in the case of two complementary innovations which are both necessary to create a new product and which are held by the patentee and the infringer, the optimal degree of patent protection should be higher<sup>60</sup>. Likewise, in the case of multi-component products, it has been argued that holdups would be a threat only when all the following conditions apply, namely that the patent covers a single component of a larger complex product, that one component is minor and has a small value and that a stand-alone product excluding the value of such patent must have been commercially and technically feasible *ex ante*<sup>61</sup>.

### 1.3. From patent hold-ups to patent strategic behavior

The abovementioned economic models offer highly dissimilar views ranging from a broad definition of hold-ups to a limited set of cases with highly restrictive assumptions. There is still another possible interpretation of economic models of patent hold-up which might be more in tune with law and economics analysis. Even though the concept of patent hold-ups might indeed require a number of restrictive assumptions much more confined than those used in the policy recommendations of Lemley and Shapiro's model, it is still the case that patent hold-ups are only one out of many possible types of strategic behavior belonging to the patent area and requiring a limitation on the use of property rules. Other problematic cases may or may not qualify as hold-ups, depending on the particular assumptions used, yet they might impose losses in dynamic as well as static efficiency terms.

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<sup>58</sup> Lemley and Shapiro, 2007, *supra* note, at p.

<sup>59</sup> See Denicolo et al., at p. 596, arguing that "If the suggested criterion were taken to mean that injunctive relief should be denied (or stays of injunctions routinely granted) whenever it is very costly or even impossible to design the product in a non-infringing way *ex ante*, this injunction policy would penalize the most valuable patents – precisely, those that are most difficult to circumvent even with full knowledge of the patent. Instead, to be consistent with the theory, the policy should indicate that to avoid injunctive relief an infringer must show not only that it is costly to redesign the product in a non-infringing way *ex post*, but also that it could easily have designed the product in a non-infringing way *ex ante* if only it had been aware of I's patent (which again emphasizes the importance of the inadvertent infringement assumption)"

<sup>60</sup> See Denicolo et al. at p. 594-595 explaining this specific case: "with two-way complementarity, innovators are more likely to be undercompensated and hence denying injunctions can be especially harmful. Intuitively, when both innovations 1 and 2 are needed to develop a product, a firm racing for innovation 1 exerts a positive externality on the firms racing to achieve 2, and vice versa. This positive externality is a source of distortion that tends to reduce the investment in R&D compared with the social optimum: the firm that first achieves innovation 1 will only benefit from its invention if component 2 is achieved as well. Thus, the expected payoff of each successful innovator is the reward in case of success multiplied by the probability (a fraction less than one) that both inventions are created."

<sup>61</sup> Denicolo et al. at p. 596.

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As a consequence, there will be cases in which it is too costly to apply a property rule even if the downstream product is not multi-component or the patented technology is essential or important –either part of a technological standard or not- in the sense that it could not have been easily invented around *ex-ante*. It is noteworthy that these apparently abstract cases largely correspond to most legal provisions and case law admitting the use of patent liability rules<sup>62</sup>.

The first case regard improvement patents or 2<sup>nd</sup> innovation patents that contribute to a much higher proportion of (social) value<sup>63</sup> with respect to the 1<sup>st</sup> innovation. The case of improvement patents is much broader than the above discussed cases of hold-ups. Nevertheless, there might be compelling reasons to conclude that these cases call for a switch into a liability rule. Such cases have in fact been regulated for long time in the national laws of many different countries, although not in the U.S. even though their implementation is confined to few cases. This is probably a consequence of the need to confine the application of such compulsory licenses as well as to the difficulty of proving that the 2<sup>nd</sup> innovation contributes in a larger proportion to the society<sup>64</sup>.

The second case envisions an innovator that has made important specific investments and is afterwards held-up by a previous patentee. This case comprises at least two sub-types; in one, the patent is part of the setting of a technological standard and in the second case (to which most models and critics refer) the infringer inadvertently uses a patented technology to the development of a multi-component product and is subsequently held-up.

Still, it is important to notice that the relevant variables to know whether a case falls within the above mentioned terms are difficult to assess. In particular, a threshold is needed to evaluate the contribution in terms of value from either innovation. This would

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<sup>62</sup> See especially the cases of compulsory licenses for blocking patents such as the Italian Code of Industrial Property in article 71 and, the *European Directive on Biotechnological Inventions*, article 12. 1. See also Robert Merges and Richard Nelson, *On the Complex Economics of Patent Scope*, *Columbia Law Review*, vol. 90, no. 4, pp. 839-960, (1990), citing different compulsory licensing provisions around the world. Compulsory licenses in cases of patent suppression or lack of use are also contained in the Italian Code of Industrial Property, article 70, among others. See also Michael Halewood, *Regulating Patent Holders: Local Working Requirements And Compulsory Licences At International Law*, *OSGOODE HALL LAW JOURNAL*, VOL. 35 NO. 2 and Haracoglou Irina, *Competition Law And Patents: A Follow-On Innovation Perspective In The Biopharmaceutical Industry*, EDWARD ELGAR PUBLISHING (2008), at p. 66, Table 3.2, citing “European National Provisions for compulsory licensing and on the experimental use exemption”

<sup>63</sup> See Merges and Nelson (p. 118-119) and Cotter p. 18-19.

<sup>64</sup> Article 31 of the TRIPS Agreement establishes in fact that compulsory licenses for the case of a 2<sup>nd</sup> patent which cannot be exploited without infringing a previous 1<sup>st</sup> patent shall comply, with the following additional requirements: “(i) the invention claimed in the second patent shall involve an important technical advance of considerable economic significance in relation to the invention claimed in the first patent”. Moreover, it is arguable, than in the light of such difficult assessment, such compulsory licenses are subject to further limits such as requiring that: “(ii) the owner of the first patent shall be entitled to a cross-license on reasonable terms to use the invention claimed in the second patent; and (iii) the use authorized in respect of the first patent shall be non-assignable except with the assignment of the second patent”.

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perhaps be easier in the case of a patent contributing to a minor part of a multi-component product than in the case of improvements when a 2<sup>nd</sup> innovation should have a much higher social value than the 1<sup>st</sup> innovation. In fact, this result is compatible both with the much stringent standard for compulsory licenses for improvement patents and the restricted number of relevant case law. The following section examines different cases of purported strategic behavior in the field of patent law, in order to illustrate the above theoretical considerations with current practices both in Europe and the U.S.

### 2. Patent strategic behavior: U.S. case law

As explained above, strategic behavior might either enhance the ability of the patentee to extract monetary sums in excess of the real value of her patent and the potential for threatening to block subsequent innovation which would cause sequential or 2<sup>nd</sup> innovators to refrain from investing in such technologies and hence, important static and dynamic efficiency losses. These potential losses are an important ground calling for the use of *ex post* liability rules.

Although the above mentioned losses are expected and cannot be ascertained accurately, courts might attempt to redress a situation of strategic behavior and under the current international patent rules are only authorized to do so in a case-by-case basis<sup>65</sup>. From a policy perspective the necessity of such examination by courts requires to further consider whether and to what extent is it advisable to prevent or redress patent strategic behavior without creating unduly burdens in terms of administrative costs and errors. As a first step, this requires a proper identification of the grounds to switch into a liability rule.

Law and Economics literature as well as an important thread of recent U.S. case law suggest that the problem of strategic behavior especially in the form of patent hold-ups is a growingly important reason calling for the use of liability rules notwithstanding its potential costs. Such theoretical findings are complemented by empirical studies showing that strategic behavior is probably increasing in frequency and impact and that specific industries of growing importance in today's economy that have been particularly exposed to the increasing use of strategic behavior. Some studies have found similar evidence for the case of Europe<sup>66</sup>.

Indeed, patent strategic behavior can take place in different contexts, either through the use of a patent portfolio or individual patents and its effects can either be anticompetitive or not<sup>67</sup>. The following sections attempt to give a broader landscape for patent strategic

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<sup>65</sup> As explained above, *ex-post* liability rules for patents are the only possibility allowed by the TRIPS Agreement in the sense of the requirements of article 31 (a) which says that "authorization of such use shall be considered on its individual merits".

<sup>66</sup> See next section

<sup>67</sup> See HARHOFF ET AL., *supra* note proposing the following concept, which, however, would only apply to an entire patent portfolio and not to individual patents: "strategic use of the patent system arises whenever firms leverage complementarities between patents in order to attain a strategic advantage over technological rivals.

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behavior, starting from recent U.S. case law and then comparing this with the European current landscape. Practices that allegedly amount to patent hold-ups are compared to other adjacent practices in order to better define the scope of patent strategic behavior.

### 2.1. Problems put forward by *eBay v. MercExchange*

The U.S. case is noteworthy, since compulsory licensing provisions were largely absent from patent law and at the same time, the application of equity doctrines that gives discretion to judges in order to grant or deny injunctive relief had also been curtailed for a long time. In 2006, however, the U.S. Supreme Court acknowledged that injunctive relief rests within the discretion of district courts by pointing out that patent law cases should be governed by the traditional principles of equity in a decision that represented a major turning point in patent policy. In fact, whereas patent law is said to be distinctive in many different ways, the uniqueness of patent law does not necessarily weight in favor of awarding injunctions in an automatic way. Indeed, while patent's unclear boundaries and the growing problems of patent notice and decrease of quality weight against using property rules<sup>68</sup>, the exclusive nature of patents as a mechanism to provide innovation incentives weights in favor.

These two contradictory arguments were evidenced in the two concurring opinions given by Justice Roberts and Justice Kennedy opinion in the *eBay* decision. In spite of being a unanimous decision, such divergent views provided little guidance for district courts to apply the traditional test in patent cases. This equitable test for the issuance of injunctions is probably the context in which *ex-post* liability rules have been discussed most extensively and thus a useful framework to analyze the underlying purpose of the rules, potential problems with their application and also to give a sense of the current landscape in U.S. patent law with respect to their use.

According to the Kennedy's opinion, treating injunctions as an equitable relief -and thus allowing the use of *ex-post* liability rules for infringed patents- could be a potential solution for three interconnected problems in the context of modern technologies: a) the impact of strategic behavior and specifically hold-ups; b) the growing multi-component nature of products which can at the same time exacerbate the risk of hold-ups; and c) the increase in number and economic importance of patents of dubious quality<sup>69</sup>.

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This behavior is anticompetitive if the main aim and effect of strategic use of the patent system is to decrease the efficiency of rival firms' production efforts" (emphasis added).

<sup>68</sup> See BESSEN AND MEURER; chapter 3.

<sup>69</sup> In fact these three reasons are mentioned subsequently in the same paragraph: "An industry has developed in which firms use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees. For these firms, an injunction, and the potentially serious sanctions arising from its violation, can be employed as a bargaining tool to charge exorbitant fees to companies that seek to buy licenses to practice the patent. When the patented invention is but a small component of the product the companies seek to produce and the threat of an injunction is employed simply for undue leverage in negotiations, legal

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The following section analyses these three reasons<sup>70</sup> which all reflect the underlying message that the modern patent landscape has greatly changed and that important opportunities have emerged for patent strategic behavior. These three arguments refer to such changing landscape and are all based on different strategic behavior practices of modern times.

### 2.1.1. Strategic behavior

The Kennedy's opinion argued in favor of the use of *ex-post* liability rules due to the increasing evidence of patent strategic behavior in its specific variant of patent hold-ups. Essentially, the further two reasons described below can be rephrased in the context of patent strategic behavior. According to Justice Kennedy concurring opinion:

"An industry has developed in which firms use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees. For these firms, an injunction, and the potentially serious sanctions arising from its violation, can be employed as a bargaining tool to charge exorbitant fees to companies that seek to buy licenses to practice the patent (...)"

### 2.1.2. Multi component patents

A second reason why injunctions should not be awarded as a matter of course arises when the patented innovation is just a small part of a multi-component product:

"When the patented invention is but a small component of the product the companies seek to produce and the threat of an injunction is employed simply for undue leverage in negotiations, legal damages may well be sufficient to compensate for the infringement and an injunction may not serve the public interest".

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damages may well be sufficient to compensate for the infringement and an injunction may not serve the public interest. Injunctive relief may have different consequences for the burgeoning number of patents over business methods, which were not of much economic and legal significance in earlier times. The potential vagueness and suspect validity of some of these patents may affect the calculus under the four-factor test" (footnotes omitted).

<sup>70</sup> The arguments offered by the Kennedy's opinion are mentioned as a simplified grouping of the most important arguments calling for the use of *ex-post* liability rules in the context of U.S. patent law. The Kennedy opinion in fact compiled a number of arguments elaborated by previous academic and policy discussion papers. Hence, the choice of referring to the Kennedy's opinion is not motivated to favor *a priori* its conclusion but to discuss the potential grounds for the use of *ex-post* liability rules. These grounds would not be possible to infer from the text of the majority's opinion as it did not provide ulterior guide or any reasoning beside the traditional use of an equity four-factor test while the opinion by Justice Roberts does not provide any ground for the use of *ex-post* liability rules but rather elaborates on the principal arguments against their use.

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In fact, there are two inter-related but different arguments in such assertion. The first is the inherent changing nature of innovations and the fact that modern patents are usually embed in multi-component products. This change, which does not pertain to patent policy but is rather an inherent characteristic of modern technologies, is however problematic since most patent laws around the world, including the U.S. were designed when inventions were mostly of the one-patent/one-product type. Conversely, products of the information technology industries such as microprocessors, mobile phones, software and DVD's are frequently covered by a great number of different patents<sup>71</sup>.

Although this is a largely empirical issue which has been -at least partially- evidenced by recent studies, as a consequence of this change there are more opportunities for strategic behavior to emerge. Each manufacturer that seeks to develop a product using a previous patent(s) must either seek consent from the patent owner(s) or else risk that such use might be considered infringing. As explained with more detail below, the problem of patent hold-up is then fostered by the fact that a patent owner of a small part of a multi-component product can extract rents above the economic value of the patent by threatening to use an injunction to shut down the production of the multi-component product.

### 2.1.3. Dubious quality patents

Probably one of the most controversial parts of the Kennedy's opinion is that which refers of some patents, especially those over business methods, being of dubious quality and hence problematic to enforce through the use of property rules:

"Injunctive relief may have different consequences for the burgeoning number of patents over business methods, which were not of much economic and legal significance in earlier times. The potential vagueness and suspect validity of some of these patents may affect the calculus under the four-factor test".

Whereas such reflection echoes widespread concerns about the convenience of patenting business methods and the quality of such patents, it in fact raises two important but different questions. The first question is whether it would be economically advisable to use property and liability rules in order to fine-tune the quality of patents or whether it is preferable to use a different policy lever. A second question is to what extent courts can alter the balances already established by the Congress in patent law, especially with regards to the patentability of some inventions such as business method patents.

From an economic point of view it is important to ask whether a particular type of patent presents a problem for the overall system. Secondly, and even though it is assumed that

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<sup>71</sup> See Lemley, Shapiro, *Patent Trolls: Fact or Fiction?* Hearing before the Subcomm. On Intellectual Property of the House Commission on the Judiciary, 109 Cong. 5 (2006). See also the Statement of Chuck Fish, Vice President of Time Warner.

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the decreasing quality of patents imposes economic losses, it is important to know whether it is efficient to solve these problems through the use of property and liability rules or through the use of a different policy lever. An alternative in fact would be to adjust the patentability requirements, including patentable subject matter, novelty and inventive step and to improve the quality of patents by improving the process of patent examination. Losses are in fact imposed in a general category of patents if the costs of granting patents for such area surpass the benefits. As the main benefits from the issuance of patents are to provide innovation incentives, disclose socially beneficial information that could otherwise remain secret and facilitating the commercialization of innovations, it is important to analyze whether such three justifications are achieved through the granting of business method or software patents in spite of variegated critics<sup>72</sup>.

From a legal point of view, if courts opted for dealing with the problem of patent quality by systematically denying injunctions for some -problematic- categories such as business method patents, such decision could be criticized on the grounds of discrimination against a specific type of innovations in violation of article 27 of the TRIPS Agreement. In addition, correcting the problem of low patent quality and the patentability of some technological areas is not in principle a task for courts at the time of deciding on the available remedies for infringed rights.

It is evident that some types of patent might pose particular difficulties for courts when protected through an injunction<sup>73</sup>. Nonetheless, the quality of patents, regardless of their type, might be affected through a set of patent strategies that include the use (and abuse) of divisional applications, continuations of applications and other filing strategies which might obscure the disclosure function of patents and increase the risk of inadvertent infringement<sup>74</sup>. Such practices extend beyond the business method, software or any other patent category.

Hence, two different perspectives are implied in the problem of patent quality. One could be described as a "macro" perspective responding to the question of whether a category such as business methods should be patentable at all. The same might happen with other problematic fields, including the patenting of information-based technologies, software and certain biotechnologies of informational nature. Under the second perspective, which we could describe as "micro", what is implied is not the technological category of the patents but the conduct of the patentee. This is the case of the burgeoning number of patents with complex, long and numerous claims, the use of filing strategies as divisional

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<sup>72</sup> However, this paper does not address this specific question, as it falls out of its scope but rather concentrate on the interface if any, between the uses of liability rules with such purported problems of the patent system beyond strategic behavior.

<sup>73</sup> Whereas the patent claims are the boundaries of a patent right, business method patents usually present vague claims a higher number of claims than the average patent as well as other related problems. See Dreyfuss, R. C. D. (2000), *Are business method patents bad for business*, SANTA CLARA COMPUTER AND HIGH TECHNOLOGY LAW JOURNAL 16, 263-278.

<sup>74</sup> See section below. See BESSEN AND MEURER, *supra* note. For a similar reasoning and warning in Europe see Harhoff.

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or continuation applications and, importantly, of any other similar strategy that might arise with time.

It could be argued that, whereas equitable doctrines are an adequate option to deal with the second perspective of the problem, which is in any case a strategic behavior of patentees, the “macro” facet of patent quality is better dealt *ex ante* through the use of the above mentioned policy levers<sup>75</sup>.

### 3. The landscape of strategic behavior in Europe

Important differences exist between patent rules, practices and industry characteristics that divide the European landscape from that of the U.S. Amongst the most important features for the purposes of this discussion are the harmonization –and lack of harmonization- of certain European patent rules, the opportunity for forum shopping that arises from a fragmented landscape with regards to patent litigation as well as the opportunity provided by the competition between different rules in place at the moment. The careful study of the characteristics of each patent system and their economic analysis would certainly be fundamental for the forthcoming processes of harmonization, especially the projected European Patent Litigation Agreement (EPLA) and the Community Patent<sup>76</sup>.

Lacking a unitary system of litigation, each country’s patent litigation widely varies within Europe. France, Germany, the Netherlands and the United Kingdom are the countries producing the highest number of patent applications and have as developed more specialized patent courts<sup>77</sup>. In fact these four countries concentrate approximately 90% of patent litigation in Europe<sup>78</sup>. Whereas patent litigation takes place either in the context of revocation proceedings in which the validity of patents is challenged or in infringement trials to enforce patent rights, the estimated probability that a patent is litigated varies between 1% and roughly 3% in most patent systems<sup>79</sup>, with some further differences in accordance to technical sectors, industries and countries.

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<sup>75</sup> References to economic literature suggesting the use of policy levers, however, without differentiating within the macro and the micro problem.

<sup>76</sup> This section attempts to provide a brief overview on the European patent litigation system, mainly focused on the issue of patent strategic behavior. While the analysis contained in this section is widely different than the above section describing the U.S. in the context for strategic behavior this is firstly due to the absence of completely equivalent situations to be compared to the U.S. eBay and post eBay decisions. Secondly it is an attempt of broadening the allegedly narrow concept of patent hold-ups as understood in the context of U.S. patent debates.

<sup>77</sup> Dietmar Harhoff, *Economic Cost-Benefit Analysis of a Unified and Integrated European Patent Litigation System*, TENDER NO. MARKT/2008/06/D, 26 February, 2009, available at: [http://ec.europa.eu/internal\\_market/indprop/docs/patent/studies/litigation\\_system\\_en.pdf](http://ec.europa.eu/internal_market/indprop/docs/patent/studies/litigation_system_en.pdf)

<sup>78</sup> See Harhoff (2008) *supra* note 77 at p. 13.

<sup>79</sup> See Harhoff, 2008, *supra* note 77 at p. 14

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The lack of a unified European litigation system is said to have generated numerous problems that have in effect encouraged negotiations on the EPLA. Firstly, resources are duplicated and wasted in different proceedings to enforce the same patent in various countries due to the territorial nature of patents and the absence of a European litigation court. Secondly, difficulties for trade might arise inside the EU due to the diverging outcomes of litigation which can cause one patent to be protected in one country while not in another. Thirdly, delays and hold-ups might follow because the fragmented nature of the system creates the opportunity to adopt delay strategies or the creation of entry barriers by raising the costs of potential entrants<sup>80</sup>. In fact, litigation and especially high litigation costs have been blamed to produce and worsen incentives for strategic behavior<sup>81</sup>.

A distinctive feature of European patent litigation is the existence of a procedure for post-grant opposition which offers a lower cost mechanism to ask for the invalidation of patents. Lower cost opposition procedures have been perceived as a fundamental feature of the European patent system and several studies have in fact suggested transposing these rules into U.S. patent legislation in order to deal with some perceived flaws in this system<sup>82</sup>.

Overall, most commentators highlight how the European patent system remains immunized from the problems afflicting the U.S. in terms of strategic litigation including the emergence of patent trolls and hold-ups and the increasing importance of patent thickets as well as the decreasing quality of patents<sup>83</sup>. This is said to be the consequence of several features of the European system including incentives given by EPO patent examination rules, such as higher fees, a tax impose for applications with numerous claims and others which have assured a higher quality of examination as well as opposition procedures which provide a lower cost mechanism to weed out invalid patents.

Nonetheless, some recent studies providing a closer look on the European patent system have concluded that some of its laudable features might either be jeopardized or affected by the emergence of strategic patenting, an important increase in the number, complexity and lower quality of applications and also by the emergence of several instances of

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<sup>80</sup> Ibid at p. 18.

<sup>81</sup> Ibid at p. 11, arguing that “the cost level of litigation determines to what extent a potential for hold-up exists” and quoting from Ellis, T.S., *Distortion of Patent Economics by Litigation Costs*. Proceedings of the 1999 Summit Conference on Intellectual Property, University of Washington, Seattle. *CASRIP Symposium Publication Series*, 5, July 2000, 22-26, available at: <http://www.law.washington.edu/CASRIP/Symposium/Number5/pub5atcl3.pdf>, last accessed on August 10, who argues that high litigation costs distort patent trade and the patent system.

<sup>82</sup> See Paradise, Jordan K., *Lessons from the European Union: The Need for a Post-Grant Mechanism for Third-Party Challenge to U.S. Patents*. MINNESOTA JOURNAL OF LAW, SCIENCE & TECHNOLOGY, VOL. 7, NO. 1, pp. 315-326, 2005, available at SSRN: <http://ssrn.com/abstract=897741>, (discussing opposition decisions at the EPO and advocating for the adoption of a similar third party opposition procedure in the U.S.);

<sup>83</sup> See Harhoff 2007.

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strategic litigation<sup>84</sup>. Studies cite that such events have been worryingly accompanied by a drop in the number of opposition procedures<sup>85</sup>. These findings are even more distressing as it is understood that:

“Fast and low-cost revocation proceedings are also a good defense line against “patent trolls” seeking to extort licensing fees from other parties based on weak or questionable patent rights”<sup>86</sup>

The following section briefly analyzes some findings of the latest studies on the European patent system that might have an impact in strategic practices and abusive behavior and that could be potentially tackled through the use of *ex-post* liability rules. Most countries in Europe have national laws which include some sort of compulsory licensing provisions<sup>87</sup>. If there is any lesson to be learned from the emergence of patent filing and litigations strategies in the U.S. which preceded and probably led to the U.S. Supreme court decision in the *eBay* case and other related cases adopting flexible standards in order to deal with such problems, it is precisely a warning against completely rigid rules. This would especially be the case with the adoption of property rules without the possibility of exceptions for the enforcement of patents, either at the level of substantive law with the provision of compulsory licenses or at the level of enforcement law through the regulation of remedies such as injunctive relief as well as other compulsory measures which might be the object of harmonization in the years to come<sup>88</sup>.

### 3.1. Incidence and effects of strategic behavior

Recent studies have highlighted that an increasing number of applications, in the form of an “escalation” has been taking place within Europe in a way similar to this process in the U.S. patent system. Such patent race does not seem to respond to higher innovation or other external factors but rather to an increasingly offensive and defensive use of patents, especially in some technological areas:

“specific technology areas within the patent system are affected by competition between large patenting firms to build large patent portfolios. In our view the resulting patent

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<sup>84</sup> Cite Harhoff 2007 and others

<sup>85</sup> See Harhoff, 2008 at p. 45, arguing that: “opposition at the EPO used to involve more than 10% of granted patents in the early 1980s, but has declined to a level around 5%.<sup>77</sup> One reason for the declining attractiveness may be the long delays in resolving opposition and any subsequent appeal cases. The unified Patent Court would offer an interesting alternative”. See also Graham, S. G. H and D. Harhoff, *Can Post-Grant Reviews Improve Patent System Design? A Twin Study of US and European Patents*, CEPR DISCUSSION PAPER NO. 5680, LONDON (2006).

<sup>86</sup> Dietmar Harhoff, 2008, *supra* note at p. 45.

<sup>87</sup> See above, footnote.

<sup>88</sup> See the proceedings of negotiations on the EPLA and the European Community Patent within the European context as well as available drafts on the negotiations of ACTA (Anti-Counterfeiting Trade Act).

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portfolio races lead to increases in transactions costs and socially wasteful investments in the management of patent portfolios(...)Consequently we come to the conclusion that public policy should seek to reduce the incentives of large patent applicants to patent innovations of questionable novelty value”<sup>89</sup>.

Studies have suggested that such increasing “arms race” might affect predominantly small firms and individual innovators whereas it might not increase R&D expenditures but rather legal and administrative expenses directed at the utilization of any possible loopholes in the patent system<sup>90</sup>. In fact, the strategic construction and use of patent portfolios has been accompanied by an increase in strategic behavior practices in the application process, which is documented in Europe under the following terms:

“Not only do firms make patents more comprehensive, longer and more complicated by adding claims. They also increase the number of divisional patents and the number of patents that share the same priority. Both of these measures provide an indication that patent applicants are making it more difficult for rivals to determine the precise content of their patents and thereby the degree of protection which firms will enjoy” (references omitted) <sup>91</sup>

The consequences of such landscape might be summarized as follows. Firstly, and from the perspective of the patent office, there has been an increasing number of patent applications and the use of several strategies that causes a decrease in the quality of patents due to constrained resources for patent examination and increasing workload. This result might additionally turn into in a vicious circle whereby low quality generates incentives to file even more applications<sup>92</sup>. Secondly, from the perspective of patentees, strategic behavior might materialize in the form of strategic management of patents portfolio, strategic management of individual patents or clusters of patents, the use of patent filling strategies and the use of enforcement and litigation strategies:

“there is ample evidence that strategic patenting behaviour, such as we have documented it in this study, is having effects on firms’ behaviour that are highly likely welfare decreasing. Most importantly we can see that these developments are affecting the ability of the European Patent Office to fulfill its mission”<sup>93</sup>.

Such escalation of patents is more closely associated with some specific technological sectors. In some of these sectors the aim is to accumulate patents towards enabling cross-

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<sup>89</sup> See Dietmar Harhoff et al. p. 277-278.

<sup>90</sup> Harhoff et al, 2007 at p. 260 for the European landscape and a comparison with the U.S., citing previous studies backing up such conclusions. For the U.S. landscape see also BESSEN AND MEURER, 2008.

<sup>91</sup> Harhoff et al, 2007, at p. 259.

<sup>92</sup> See *ibid* at p. 264: “the inelastic supply of examination capacity and of legal expertise together with increased demand for examinations caused by the escalation mechanism may lead to a feedback loop which leads to steadily decreasing quality of granted patents”.

<sup>93</sup> *Ibid* at p. 266-267.

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licensing whereas in others the goal is to block rivals. As a consequence, it has been suggested that competition policy should take into account such important differences in patent strategic behavior between technological sectors and again, that it should avoid the use of one-size-fits-all solutions<sup>94</sup>.

### 3.2. A case study: the European Pharmaceutical Sector

Important differences remain within technological sectors, with some of them being more affected by the patents “arm race” and the emergence of strategic behavior practices. In contrast to most studies about patent hold-up, which usually refer to software and business method patents, the pharmaceutical sector is often mentioned as “immune” to such problems and responsive to the incentives generated by the patent system. However, recent studies have affirmed the findings of a number of problematic practices present in this sector as well as the increasing use of several patent strategies. This section is precisely motivated and drawn from the recently released Report on the Inquiry of the European Commission directed to investigate the European Pharmaceutical Sector. It is perhaps the most throughout and up-to-date evidence on patent practices, including strategic behavior, which is available in Europe at the time. In addition the inquiry in the pharmaceutical sector offers an opportunity to confront with most other European studies -following the most debated cases from U.S. studies- that focus on the sector of information and communication technologies with the landscape of a sector that is usually assumed to benefit from the patent system and to be the lively proof of its correct performance.

There might indeed be systematic problems in the European Pharmaceutical industry but even in the absence of definitive conclusions it is yet possible to argue that the evidence weights in favor of maintaining proper spaces for a flexible use of *ex-post* liability rules. The use of discretionary rules could be a complement rather than a substitute of other policy changes directed at a particular technological sector perceived as problematic as it happens with business method or software patents in the U.S. *Ex-post* liability rules are probably necessary for a lower number of cases which nevertheless might have an important impact on the patent landscape. Such cases are precisely rooted in strategic behavior practices that mutate with time, might affect any technological sector and cannot be dealt efficiently through the use of general or *per se* rules but rather through standards or rules of reason that are able to adapt to the particular circumstances of time and industry.

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<sup>94</sup> Harhoff et al, 2006 Ibid at p. 278, arguing that: “evidence of an escalation of firms patenting activities only in a subset of the technologies covered by patent protection by the EPO. Within these technology areas we find evidence of two distinct patenting behaviors. The first being directed towards cross -licensing of patent portfolios and the second focusing more on protection of own technologies and blocking of rivals. In consequence reviews of competition and enterprise policy need to recognize the difference between technology sectors. This is best achieved in sectoral reviews that take into account the competitive interaction of firms both in technology - and product markets”.

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The Pharmaceutical sector inquiry performed by the European Commission indeed pertains to one of the most complex and important technological fields from the perspective of patent law. It is probably the technological sector with the highest response to the economic incentives set by patent law<sup>95</sup> but in addition to patent law, the pharmaceutical sector is subjected to a complex web of regulations that relate to the marketing approval of new substances, price controls and reimbursement systems<sup>96</sup>. The pharmaceutical sector is important both in terms of R&D expenditure but also in its impact on the health of citizens and the correct functioning of national health systems<sup>97</sup>.

In 2008, the European Commission launched an investigation aiming at assessing “the reasons for observed delays in the entry of generic medicines to the market and the apparent decline in innovation as measured by the number of new medicines coming to the market”<sup>98</sup>. The focus was directed towards inquiring on “the competitive relationship between originator and generic companies and amongst originator companies”. The Commission selected 43 originator companies and 27 generic companies for in depth analysis, which together represented the 80 % of the relevant turnover in the EU, being mostly larger scale companies active in more than one Member State. The inquiry and the report concentrated on behavior by pharmaceutical firms, leaving aside any other changes inherent to the technological sector or financial aspects that might also influence the innovativeness of the sector. For the purposes of the Inquiry and the Final Report, patents were classified into two main types, primary patents protecting the active ingredient, and secondary patents, protecting all other aspects relating to a pharmaceutical product<sup>99</sup>.

The results of the Inquiry largely validate those of other previous studies, especially with regards to the increase in the number of patent applications<sup>100</sup> as well as the increasing use of patent strategies which are doubtfully contributing to foster innovation incentives. The

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<sup>95</sup> See Wesley M. Cohen, et al., *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)*, NBER WORKING PAPER NO. W7552 (Feb. 2000), surveying different industries’ patterns in the use of patents and finding that they are important incentives to innovate only in a few industries such as chemistry and pharmaceuticals.

<sup>96</sup> See Final Report at (39), p. 19.

<sup>97</sup> Ibid at (42), p. 19, referring that “In 2006 pharmaceutical spending accounted for 17% of health spending in the OECD. Today, pharmaceutical spending is the third largest component in health care spending after hospitals and ambulatory care”.

<sup>98</sup> See Commission Decision of 15 January 2008 initiating an inquiry into the pharmaceutical sector pursuant to Article 17 of Council Regulation (EC) No 1/2003 (Case No COMP/D2/39.514), available at: [http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/decision\\_en.pdf](http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/decision_en.pdf), last accessed on August, 10, 2009.

<sup>99</sup> See Final Report, at (427), p. 164, explaining that: “Of the nearly 40,000 cases, some 87% were classified by the companies as involving secondary patents, giving a primary: secondary ratio of approximately 1:7. Of applications still pending, 93% were classified as secondary (a primary: secondary ratio of approximately 1:13), whilst 84% of the patents granted were classified as secondary (a primary: secondary ratio of approximately 1:5).

<sup>100</sup> But see the latest trend indicating a slightly lower number, in Final Report, *ibid* at p. “In 2008, the EPO received 146,500 patent applications, an increase of 3.6% compared to 2007. In 2008, in total, 49.5% of final actions (outcomes) in examination were grants, down from 51% in 2007. This lower percentage of grants may be seen as a first result of the EPO's increasing focus on ensuring the quality of granted patents”

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practice of filing divisional applications for instance has increased in the field of pharmaceuticals<sup>101</sup> in a way similar to the overall increase in all EPO applications yet it remains at even higher relative levels<sup>102</sup>. Opposition procedures are however more frequently used in the pharmaceutical sector and might have a countervailing effect with respect to the increasing number of applications<sup>103</sup>. Some specific features are found in the pharmaceutical sector as generic companies tend to oppose almost exclusively secondary patents and to prevail in approximately 60% of final decisions rendered by the EPO (2000 - 2007). At the same time, originator companies tend to oppose each other's secondary patents and prevailed in approximately 70% of final decisions.

However, in around 80% of cases it took a long time of more than two years to arrive into a final decision. It is important to recall that during this rather long period of time generic companies were not able to obtain a clarification of the situation with respect to the patent and enter into the market. Further particularities of the patent pharmaceutical sector in Europe are the high concentration of the top selling products<sup>104</sup>.

Litigation procedures for invalidity and infringement are, as already explained, variable in accordance to each national member state. One particular characteristic of litigation is that some national courts provide for separate procedures for enforcement and invalidation. As each procedure is independent, invalidity of the patent cannot be used in those cases as a defense against an enforcement action. Additionally, some national courts make it difficult to challenge the validity of the granted European patent when opposition proceedings before the EPO are pending and hence a final answer from the EPO is needed before invalidity proceedings can continue in those courts<sup>105</sup>.

### 3.2.1. Patent Strategies in the European Pharmaceutical Sector

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<sup>101</sup> Ibid at p. The total number of voluntary divisional applications for A61K\* the rose from 102 in 2000 to 470 in 2007 and compared to the number of overall application in A61K\*, the relative share of divisional applications rose from 3.5% in 2000 to 8% in 2007.

<sup>102</sup> Ibid at p. The number of voluntary divisional applications has grown in a parallel manner from 2.3% in 2000 to 4.9% in 2007, yet remains, in relative terms, on a lower level than in A61K\*.

<sup>103</sup> Ibid at p. 5.2% of granted patent applications at the EPO were opposed during 2007 and granted patent were revoked in 38% of cases and maintained in amended form in 30% of cases. Oppositions in the pharmaceutical sector tend to be more frequent (8%) than in organic chemistry (4%) and across all sectors (5%).

<sup>104</sup> The top 20% of INNs (International Non-proprietary Name for pharmaceutical substances) by total number of patents granted and pending applications, account for 60% of all patents and applications, whilst the top 50% account for 90%.

<sup>105</sup> Ibid at (685), p. 245, "Therefore it can take up to 7 years or something more to get a final decision from the EPO. Some National Courts are particularly good at providing decisions quickly. [...] National revocation action or actions may be filed in parallel to a European Opposition in key territories or territories where prompt decision may be expected. Some National Courts may stay any such actions until the final outcome of the European opposition is known, but many (for example UK and Belgium) will not if it appears that legal certainty is important and the proceedings at the EPO have some time still to run".

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The Final Report considered a number of practices used by “originator companies” in order to maintain exclusivity for their pharmaceutical products. This is fundamental for the sector, especially with regards to products with top sales (blockbusters) on which the Report particularly focused. In order to address the questions of why generic entry is blocked and why the number of new pharmaceutical substances has declined with time, the Report dealt with both competition between originator and generic companies as well as with competition between originator companies.

Strategies used by originator companies in their relationship with generic companies are important for competition law, patent law and regulation insofar as they might aim at delaying the entrance of generics by creating unduly barriers. The Report acknowledged two principal objectives of the strategies that originator companies might pursue in order to exclude competitors. The first aim is maintaining exclusivity on blockbuster products during the whole period of the patent and of market exclusivity and avoiding challenges to the patent validity. This is mainly pursued through the filing of so-called patent clusters, that is, “a multitude of patent applications (on process, reformulation, etc.) protecting the product in addition to the base patent with the aim of creating several layers of defence”<sup>106</sup>.

The second aim is extending the period of exclusivity beyond the duration of the patent. This is pursued through the same multitude of filings during and towards the end of the period of patent protection. In practice, both objectives are pursued through overlapping strategies, as the same patent clusters for a given product might be able to protect against patent invalidity challenges as well as extending the patent period<sup>107</sup>.

Both types of practices are used in tandem with enforcement procedures including preliminary and final injunctions. For instance, by filing clusters of patents on slightly modified versions of a chemical form, an originator company might then engage into an aggressive enforcement of such patents. In a series of documents obtained during the investigation, a testimony of one Originator Company expressly indicated the following:

"We were recently successful in asserting the crystalline form patent in [name of country], where we obtained an injunction against several generic companies based on these patents by 'trapping' the generics: they either infringe our crystalline form patent, or they infringe our amorphous form process patent when they convert the crystalline form to the amorphous form. [...] The availability of 'trapping' strategy will be evaluated on an on-going basis"

Such modified versions of a new molecule, which are often categorized as incremental or “secondary innovations” might be socially desirable insofar as they might enhance the safety and efficacy of a drug. However, it is still the case that such patents might in some

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<sup>106</sup> See Final Report, *supra* note, at p. 184 (476).

<sup>107</sup> *Ibid* at p. 186-187, footnote 355.

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cases be considered dubious in terms of patentability requirements, especially under the test of non-obviousness or inventive step. That means that even though society benefits of such innovations, the absence or dubious presence of the patentability requirements might signal that such innovations would have been developed even in the absence of patent protection. This seems to be the case in many European cases where patents have been revoked in 60% of opposition and appeal procedures against originator companies whereas the scope of the patents was reduced in another 15%, in procedures concerning almost exclusively such "secondary patents". In cases litigated between an originator company and a generic company concerning the validity of patents, 55% of such patents were finally annulled<sup>108</sup>.

Filing strategies of pharmaceutical companies include the construction of patent clusters especially for the most (privately) valued patents. According to the inquiry individual medicines are protected by even 100 product-specific patent families, which can amount to 1,300 patents and pending patent applications across Member States. In addition, the number of patents and patent applications is 140% higher for the top selling medicines in confront to the rest of the sample.<sup>109</sup>

A second filing strategy is the use of divisional applications, which are a procedure provided by law in order to divide an initial or parent patent application. Whereas in theory, the divisional cannot extend the content of the original application or its protection period, in practice because the examination of divisional applications continues notwithstanding the outcome of the parent application -even if the parent application is withdrawn or revoked- a divisional can in fact extend the examination period of the patent office. This practice then entails great uncertainty over patents for generic companies and in fact, the EPO has recently limited their use<sup>110</sup>.

The report also enquired on the litigation practices used by originator companies, starting from the premise that the enforcement of one's right is in itself enshrined in the European Convention on Human Rights. Nonetheless the Report recognized the potentially detrimental effects that the use of litigation might impose to competitors when it is used

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<sup>108</sup> More specifically, originator companies won 53% of final rulings concerning product patents, whereas nearly 70% of final judgments handed on process patents 83% of cases regarding second medical use patents and 88% regarding first medical use patents were favourable to the generic companies. Final Report, supra note at p.226-227; arguing that: "Hence, it would appear that among litigated patents the strength of process patents, first medical use and second medical use patents is relatively more limited and their challenge before court more often yields favourable results for generic companies".

<sup>109</sup> European Commission, Communication from The Commission, Executive Summary of the Pharmaceutical Sector Inquiry Report at p. 10.

<sup>110</sup> See the Decision of the Administrative Council of the European Patent Organisation of 25 March 2009 amending the Implementing Regulations to the European Patent Convention (CA/D 2/09) at: <http://www.epo.org/patents/law/legal-texts/decisions/archive/20090325.html>

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mainly as a way to deter entry of generic companies and as a means to create obstacles for competitors, especially if they are smaller<sup>111</sup>.

Litigation was found to be rising and in a sample of 219 molecules, originator and generic companies referred more than 1300 patent-related out of court contacts and disputes concerning the launch of generic products corresponding to the period of 2000-2007 where the number of cases grew by a factor of four. From a total of 698 cases of patent litigation between originator companies and generic companies, 223 cases were settled, final judgments were given in 149 cases and 326 cases were either pending or withdrawn<sup>112</sup>.

Originator companies were found to have initiated the majority of the cases yet generic companies won 62% of the 149 cases. The average duration of the court proceedings was of 2.8 years, but there were important variations between Member States. Primary patents concerned the majority of cases in the pre-litigation phase whereas the majority of litigation concerned secondary patents. In 30% of the cases, litigation was initiated between the same parties in more than one Member State with respect to the same medicine. In 11% of the final judgments reported, two or more different courts across EU Member States gave conflicting final judgments on the same issue of patent validity or infringement<sup>113</sup>.

The findings of the Report confirm the general conclusion of patent studies providing evidence that litigation is costly and lengthy. The total cost of patent litigation in the EU (years 2000-2007) with regard to 68 medicines was estimated to be above € 420 million. The final report highlights the savings that could have arisen if a community patent and a unified patent court were present<sup>114</sup>.

With regard to the use of preliminary injunctions, originator companies were found to have asked for one in 255 cases with a favorable response in 112 cases. The average duration of such preliminary measure was of 18 months. In 46% of cases where an injunction was granted the results of the proceedings consisted either in a final judgments favorable to the generic company, or in a settlement apparently favorable to the generic company.

Yet the Report highlighted the differences present in different countries with regard to the requirements to obtain preliminary injunctions. For instance, it is easy to obtain preliminary injunctions in Belgium whereas the patent holder has to show that there is a serious issue to be tried in order to obtain an injunction in the U.K. and courts in Germany

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<sup>111</sup> See the Final Report, at p. 201: "litigation can also be an efficient means of creating obstacles for generic companies, in particular for smaller ones. In certain instances originator companies may consider litigation not so much on its merits, but rather as a signal to deter generic entrants".

<sup>112</sup> Ibid at p. 11.

<sup>113</sup> Ibid at p. 11.

<sup>114</sup> European Commission, Communication from The Commission, Executive Summary of the Pharmaceutical Sector Inquiry Report at p. 12.

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and the Netherlands are more inclined to take into consideration the merits of the case when considering whether to grant one<sup>115</sup>.

### 3.2.2. Policy suggestions of the Final Report

Whereas the data compiled by the inquiry and Final Report on the European Pharmaceutical Sector are an important contribution towards the understanding of such specific sector and of the European patent landscape, especially with regards to patent strategic behavior, some of its policy conclusions are rather simplistic. The four main suggestions of the Report were: (1) Intensify Competition Law Scrutiny; (2) Rapid Establishment of the Community Patent and Creation of a Unified Litigation System; (3) Streamlining the Marketing Authorisation Process and Improving Pricing and Reimbursement Systems and Developing a Pro-Competitive Environment for Generic Uptake. Whereas all these suggestions cover important aspects of the pharmaceutical sector, we only focus on the first two as they directly though partially pertain to our debate.

In particular, the Report gave a quite complete view on the practices used by pharmaceutical companies which might prompt the future use of antitrust or projected reforms in the patent system. In contrast, the suggestions to cope with such problems are sometimes vague and limited. In the case of competition law, this might be understandable as the Report only sought to compile the basis for further eventual intervention<sup>116</sup>. With respect to the interface between patents and competition law, the Report reiterates what has become a prevailing view: that the existence and exercise of an industrial property right are not themselves incompatible with competition law and yet they are not immune from antitrust intervention. However, these practices put in place either between originator companies<sup>117</sup> or between an originator company and a generic company<sup>118</sup> were considered to infringe competition law under exceptional circumstances.

With respect to the area of patent law the incompleteness or biases of the policy suggestions of the Report might be the result of a lack of more consolidated data for some

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<sup>115</sup> Final Report, *supra* note, at footnote 205.

<sup>116</sup> Communication of the Commission, at p. 18: "Where appropriate, the Commission will make full use of its powers under antitrust rules (Articles 81, 82 and 86 of the EC-Treaty), merger control (Regulation (EC) No 139/2004)<sup>38</sup> and State aid control (Articles 87 and 88 of the EC-Treaty). The Commission, in close cooperation with the National Competition Authorities, will pursue any antitrust infringement in the sector, wherever required by the Community interest. Action can also be taken at national level and in areas which were not the primary focus of the inquiry or are outside its scope".

<sup>117</sup> See *ibid* at p. 19. "With regard to competition between originator companies in particular, defensive patenting strategies that mainly focus on excluding competitors without pursuing innovative efforts and/or the refusal to grant a license on unused patents will remain under scrutiny in particular in situations where innovation was effectively blocked"

<sup>118</sup> See *ibid* at p. 19. "As regards competition between originator companies and generic companies, delays to generic market entry are a particular point of concern. The possible use of specific instruments by originator companies in order to delay generic entry will be subject to competition scrutiny if used in an anti-competitive way, which may constitute an infringement under Article 81 or 82 of the EC Treaty".

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of the problems, practices and legal rules under analysis. The two main suggestions made in this context were to accelerate the projects of patent harmonization for the implementation of a community patent and the EPLA<sup>119</sup> and to continue to ensure the quality of EPO patents<sup>120</sup>. In contrast with such strong suggestions for further patent harmonization, for instance, the Report gave a quite incomplete view on the use of compulsory licensing in Europe:

“In Europe, compulsory licence provisions have been very rarely used in practice, including in the area of pharmaceuticals. In the sector inquiry, only two cases were identified where compulsory licences had been issued. Both of these cases concerned Italy. In the first case, the Italian Patent and Trademark Office referred the matter to the Italian Competition Authority (...) In the second case, the Italian Patent and Trademark Office itself granted a compulsory licence. This licence was subsequently revoked upon request of the two parties concerned after they had reached a settlement. Under the settlement, an exclusive licence was issued. As for compulsory licences in general, it has been submitted by the UK Intellectual Property Office that in the UK such requests - although not very common - have occasionally been made in other sectors than pharmaceuticals”.

Even though the practice of compulsory licensing has remained largely limited in many countries, especially after the enactment of the TRIPS Agreement, this information is clearly incomplete and confined only to a few cases. The Report is not limited to patent law and was rather elaborated from a competition law viewpoint. However, in both areas of law the practice of compulsory licensing is far more complex than stated above. Although this fact might only reflect a normal limitation on the scope of the inquiry which could not possibly cover all strategic patenting practices and all patent rules involved, it is important to consider that one out of the four policy formulations of the Report is the “Rapid Establishment of the Community Patent and Creation of a Unified Litigation System”. Moreover, treating this argument without further discussion is even more troubling in the light of a similar formulation made earlier this year by a Communication of the Commission, in which the issue of compulsory licensing is barely touched upon only in the context of issues relevant for developing countries<sup>121</sup>. This is in clear contrast

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<sup>119</sup> See *ibid* at p. 21: “The results of the inquiry confirm that the Community patent and unified litigation system would create significant cost and efficiency improvements, in particular by reducing the costs associated with multiple filings, by eliminating essentially parallel court cases between the same parties in different Member States and by enhancing legal certainty through the avoidance of conflicting rulings. The Commission continues to make all efforts leading to the rapid adoption of these instruments”

<sup>120</sup> *Ibid* at p. 21: “Stakeholders agree on the importance that European - and in the future Community - patents granted by the EPO should respond to a high quality standard. Strong support was further received by all stakeholders that the EPO should be enabled to accelerate procedures whenever possible. Based on its findings of the sector inquiry, the Commission supports the recent initiatives by the EPO to “raise the bar”. In this respect the Commission welcomes the recent decision to limit the time period during which the voluntary divisional patent applications can be filed. The Commission also supports the EPO in its efforts to shorten the opposition and appeal procedures”.

<sup>121</sup> See the COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL AND THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, “*An Industrial Property Rights Strategy For Europe*”.

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not only with the practice of compulsory licensing worldwide but also with the latest case law in the U.S., to which the same Communication and the Final Report refer<sup>122</sup>.

### 4. Patent strategic behavior: towards a broader framework

Liability rules are normally justified on the presence of high transaction costs and strategic behavior. As explained above, recent patent discussions on the use of liability rules have mostly been confined to the problem of hold-ups. Additionally, patent hold-ups have been mostly identified with the emergence of a business model in which firms often named patent trolls principally use patents as instruments of hold-up. This section discusses the notion of patent trolls and hold-ups and argues in favor of preferring the latter concept as a normative threshold for the use of *ex-post* liability rules while a broader context for strategic behavior is proposed as a more adaptable alternative to the use of categorical definitions such as the current definition of hold-ups. The section revises different purported definitions of actors engaging in patent hold-ups and strategic behavior while concluding that the focus of analysis should be the strategic conduct rather than any specific actor involved.

#### 4.1. Actors: Non-manufacturing entities, trolls, ambushes and others

The emergence of a new business model in which firms use patents -and the threat of injunctive relief- in a strategic way, has generated distress on governmental agencies, innovators and the U.S. Supreme Court<sup>123</sup>. Such concerns have also been expressed in some recent European reports<sup>124</sup> and used by the *eBay* decision to call for the use of *ex-post* liability rules, specifically in the concurring opinion by Justices Kennedy, Stevens, Souter and Breyer (hereinafter the Kennedy opinion)<sup>125</sup>.

A substantial part of the discussions following the *eBay* decision has in fact focused on the potential efficiency or inefficiency of a business model where firms are often named trolls<sup>126</sup>. Nevertheless many issues related to the emergence of such "new" business model still remain unclear and a source of divergence between scholars and policy makers. Among the unanswered questions are which type of firms are trolls and whether trolls -a

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<sup>122</sup> Ibid at p. 6, arguing that "Poor quality rights can also contribute to problems with "patent trolls" that have arisen in the US judicial system". Whereas we have argued that a categorization such as "trolls" does not efficiently tackle issues of patent strategic behavior, it is undeniable that these issues have been discussed in the context of the recently issued compulsory licenses in the U.S.

<sup>123</sup> See FTC, To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy, ch. 3, pp 38-39 (Oct. 2003), available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf>, quoted in the Kennedy concurring opinion in *eBay*.

<sup>124</sup> See supra. See also Harhoff et al., Final Report, The Strategic Use of Patents and its Implications for Enterprise and Competition Policies, Tender for N° ENTR/05/82, Final Report, July 8, 2007, available at: <http://www.en.inno-tec.bwl.uni-muenchen.de/research/proj/laufendeprojekte/patents/stratpat2007.pdf>

<sup>125</sup> See supra.

<sup>126</sup> See *infra* note 128.

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particular type of entity- should pose a concern for policy makers or whether patent policy should focus on the particular type of behavior behind trolls.

To begin with, the label “troll”, an arguably pejorative term, which is often substituted with the name non-manufacturing or non-practicing entities (hereinafter NMEs), comprises in fact a number of widely different entities ranging from individual inventors, joint ventures and universities to firms specialized in financing and enforcing patents. As a consequence it is difficult to identify which type of firm -if any- threatens the correct functioning of the patent system and hence the incentives to innovate.

The question that naturally follows is whether it is the type of entity that should be object of distress or whether any type of entity can -once the proper incentives are in place- act as a patent troll. If the last statement is correct, the analysis should focus on “trolling” behavior rather than on the aforementioned entities. Such result would be furthermore in line with the theoretical insights of law and economics that warn against a type of behavior -opportunistic behavior, strategic behavior and hold-ups- instead of warning against any special type of firms or individuals or against the intention, mission or principal activities of a firm. These latter could at the most be used as a presumption or guide for judges or agencies when deciding whether they are in front of any allegedly harmful behavior<sup>127</sup>.

In what follows, it is suggested that from a law and economics point of view, it is more accurate to identify patent hold-up and strategic behavior independently and isolated from the entity that carries on such behavior. The following section describe trolls and the various forms that trolls -understood as NMEs actively pursuing the enforcement of their patents- can adopt and gives three reasons why trolls should not be the potential object of a rule tackling with the above mentioned problems. The first reason relates to the difficulty of finding a unitary legal and business definition of potential trolls. The second reason is historical because any business model and even the *modus operandi* of any entity intending hold-up and strategic behavior is likely to evolve as technologies and rules change. Strategic behavior is largely adaptable and hence, the design of legal rules tackling with strategic behavior shall be as flexible as possible. The third reason why a rule directed against trolls would not be desirable is that it could deter presumably efficient behavior while failing to include inefficient behavior.

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<sup>127</sup> See Lemley, Mark A., *Are Universities Patent Trolls?* (April 11, 2007). Stanford Public Law Working Paper No. 980776. Available at SSRN: <http://ssrn.com/abstract=980776> also advancing the argument that: “Universities will sometimes be bad actors. Nonmanufacturing patent owners will sometimes be bad actors. Manufacturing patent owners will sometimes be bad actors. Instead of singling out bad actors, we should focus on the bad *acts* and the laws that make them possible. We will solve the troll problem not by hunting down and eliminating trolls, but by hunting down and eliminating the many legal rules that facilitate the capture by patent owners of a disproportionate share of an irreversible investment”.

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### 4.1.1. Definition and business models

Patent trolls have been generally described as companies that do not use their patents but rather devote their resources to licensing and/or enforcing them. Whereas the definition of NMEs comprises any patent holder that does not commercialize or works her invention, patent trolls have been often defined<sup>128</sup> as patentees that do not only abstain from using their patents but rather wait until someone “infringes” and use litigation and the threat of litigation and injunctions to actively enforce their patents. Thus -at least indirectly- it is the typical element of hold-up that occurs when someone makes specific investments in a 2<sup>nd</sup> innovation, which often separates a troll from other types of NMEs.

There is however a wide spectrum of different sub-types of NMEs that might be classified in accordance to different features<sup>129</sup> such as the way in which inventions are developed, the ownership of patents and their commercialization policies<sup>130</sup>. NMEs have largely been classified in accordance to whether or not they perform any innovation activity into two main types: 1) research centers, universities or companies devoted to R&D but not to the commercialization of their innovations and 2) companies specializing in the commercialization of or financial intermediation and/or managing or enforcement of

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<sup>128</sup> See Dolak, Lisa A. and Bettinger, Blaine T., *Ebay and the Blackberry®: A Media Coverage Case Study* (December 11, 2007). Available at SSRN: <http://ssrn.com/abstract=1082220>, illustrating how scholarly papers and even press articles about “patent trolls” have mushroomed in the follow-up of the *eBay* case. For the origin of the term “patent troll” see William R. Everding, “*Heads-I-Win, Tails-You-Lose*”: *The Predicament Legitimate Small Entities Face Post Ebay And The Essential Role Of Willful Infringement In The Four-Factor Permanent Injunction Analysis*, 41 J. Marshall L. Rev. 189, referring that Peter Detkin created the term “patent troll” in 1999 while being assistant counsel at Intel Corp. and after having being suited for libel due to the use of the term “patent extortionist”: “A patent troll is somebody who tries to make a lot of money off a patent that they are not practicing and have no intention of practicing and in most cases never practiced”; and also explaining that Mr. Detkin afterwards left Intel to join Intellectual Ventures, which could itself be considered a patent troll. (See Intel, FTC and eBay’s definition). See also Brief of *Amicus Curiae* Yahoo! Inc. as Supporting Petitioners, in *eBay, Inc. v. MercExchange, L.L.C.*, 126 S. Ct. 1837 (2006), No. 05-130, available at: <http://patentlaw.typepad.com/eBay/eBayYahoo.pdf>, last accessed on August 11, 2009, posing that trolls: “do not innovate, but rather seek to acquire broad and nebulous patent claims that arguably encompass existing technologies relied on by companies with deep pockets(...)By acquiring these claims and threatening or pursuing litigation, the patent trolls seek and often receive economic settlements from genuine innovators and producers that greatly exceed the true economic value of the patents in question”.

<sup>129</sup> See for instance, Allison, J. Lemley, M. and Walker, J., *Extreme Value or Trolls on Top? The Characteristics of the Most-Litigated Patents*, classifying non-practicing entities in 11 different sub-types.

<sup>130</sup> *Ibid* at p. 39. See also McDonough, James *supra* 1 note at p. 192-193, describing three types of trolls: 1) individual inventors that do not practice their patents; 2) companies that generate ideas for patenting and eventually licensing, e.g. Intellectual Ventures and 3) patent holding companies that buy patents for the only purpose of licensing and enforcing them, e.g. Acacia Research Corporation. Compare the mission of Intellectual Ventures LLC: “to assemble a world-class team to invent and invest in inventions with the intent of creating a new, dynamic marketplace where inventors are fairly compensated for their work and the public can be assured fair access to innovation”, available at: <http://www.intellectualventures.com/background.aspx>, last visited on August 9, 2009 with that of Acacia Research Corporation stating that: “Acacia Research’s subsidiaries develop, acquire, and license patented technologies. Acacia controls over 100 patent portfolios covering technologies used in a wide variety of industries”, available at: [http://www.acaciaresearch.com/aboutus\\_main.htm](http://www.acaciaresearch.com/aboutus_main.htm)

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patents, especially through the use of patent litigation or threats of using patent litigation. Whereas many commentators have argued that the first type of NME should have easier access to injunctive relief than the second<sup>131</sup>, some have considered both types of companies to be justified upon efficiency considerations<sup>132</sup>. The decision of abstaining from commercializing patented inventions is in the case of universities, research centers or companies specializing only in research, based upon economic reasons as specialization and efficient division of labor<sup>133</sup>. A most efficient use of resources could arise when entities specialize, some of them focusing on research and some of them on commercialization. Hence, the mere fact that an entity invents and patents an invention with no intention to practice the technology does not seem to *per se* imply any efficiency problem.

Companies specializing only on patent enforcement and financing activities have also been defended because of the special enforcement needs and the benefits provided by financial intermediation in the patent area<sup>134</sup>. One specific type of companies are funds operating on a similar basis to a normal fund with investors buying shares on the fund and the fund buying and managing patents or exclusive licenses on patents. However, and differently from a normal stock or bond fund, the commercialization and enforcement of the patent portfolio is particularly important given the complexities of patent litigation<sup>135</sup>. Hence, apart from hedging risks as a typical fund, companies operating patent-based funds need to actively pursue the enforcement of their patents<sup>136</sup>. It is the particular means used to enforce and commercialize their patents that is often criticized as troll-behavior.

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<sup>131</sup> See for instance Lemley, Mark A., *supra* note 127. See also the eBay decision acknowledging that: "For example, some patent holders, such as university researchers or self-made inventors, might reasonably prefer to license their patents, rather than undertake efforts to secure the financing necessary to bring their works to market themselves".

<sup>132</sup> McDonough, James F. *supra* note 130. See also Ronald J. Mann, *Do Patents Facilitate Financing in the Software Industry?*, 83 TEX. L. REV. 961, 1024 (2005), arguing that: "Essentially, trolls are serving a function as intermediaries that specialize in litigation to exploit the value of patents that cannot be exploited effectively by those that have originally obtained them. That is not in and of itself a bad thing".

<sup>133</sup> See Denicolo et al., *supra* note.

<sup>134</sup> See McDonough, James F. *supra* note, at p. 190, arguing that: "These trolls act as a market intermediary in the patent market. Patent trolls provide liquidity, market clearing, and increased efficiency to the patent markets – the same benefits securities dealers supply capital markets-. Ultimately, this Comment suggests that the emergence of patent trolls is simply a stage in the natural evolution of the patent market".

<sup>135</sup> See McDonough, *ibid*, at p. 211-212, proposing the alternative name of "patent dealers" to substitute the pejorative label of trolls and arguing that patent dealers are efficient because they (1) create a credible threat of litigation that an individual inventor would not have by himself and "which encourages exchange, makes patents more liquid, and facilitates market clearing through price equalization"; (2) create liquidity and transform patents in "commodities" by matching patent owners with companies seeking to commercialize patents, managing transactions and providing a "central place of exchange" and they do so precisely by holding a patent inventory and licensing it to companies seeking specific technologies and finally; (3) patent dealers clear the market by equalizing prices and undertaking risks in a market such characterized by information asymmetries among participants that might cause market friction induced by search and evaluation costs and lead to inconsistent pricing and eventually to a failure of the market.

<sup>136</sup> In Europe, for instance, the company SISVEL specializes in the management and enforcement of some patents, also promoting the formation of patent pools. See mission of Società Italiana per lo Sviluppo dell'Elettronica SISVEL, available at: <http://www.sisvel.it/english/aboutus/mission> last accessed in August 8<sup>th</sup>, 2009: "In short, SISVEL operates as a bridge between manufacturers that require access to key technology

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In addition to identifying efficiencies in the operation of NMEs, some analysts have considered that a rule disfavoring NMEs as a category –for instance by creating a presumption for denying injunctive relief- would favor big companies over small ones either intentionally or not<sup>137</sup>. Whereas such argument might actually point a valid concern it is however troubling to conclude by suggesting that permanent injunction should always follow a finding of infringement because otherwise small companies would be at a disadvantage<sup>138</sup>.

In fact, it can be argued that although the prototypical patent hold-up case involves a small NME suing a large company<sup>139</sup>, this would not be necessarily the truth in all cases whereas defendants (presumed infringers) are not necessarily big companies in all cases. A possible example –under a broader concept of strategic behavior- would be the case of pharmaceutical companies which have presumably acted strategically in order to impede the commercialization of generics<sup>140</sup>. Moreover, recent studies show that among other litigation patterns, that small firms have a higher probability of being sued relatively to their R&D expenditure than large firms<sup>141</sup>. This data could warn against associating typical troll cases with a small firm suing a large firm and especially against building policy suggestions on that basis.

A closely related argument against an absolute right to obtain injunctions for NMEs is based upon the misleading view of NMEs as “innovators” and large companies as “infringers”. This assertion is part of a broader and much more complex issue that derives from the fact that patent law in principle does not provide for an exception in case of independent invention. Hence, even if a second innovator could or in fact arrived to the same innovation independently, there will still be patent infringement<sup>142</sup>. In fact, several

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and patent owners that wish to license their portfolios to finance further research. Among its activities, SISVEL assists companies in preparing and executing a strategy to protect their R&D efforts with effective intellectual property”. It is noticeable that SISVEL appears as applicant of approximately 93 patent filing applications at the EPO –search in [esp@cenet.com](http://esp@cenet.com), last visited in August 8<sup>th</sup>, 2009-. See also Christoph, a. *Patent Trolls – Menace or Myth?*, at PATENTS AND TECHNOLOGICAL PROGRESS IN A GLOBALIZED WORLD, MPI STUDIES ON INTELLECTUAL PROPERTY, COMPETITION AND TAX LAW, N° 6, citing the case of SISVEL, which has been sometimes referred as a European patent troll.

<sup>137</sup> See Golden, John M., 'Patent Trolls' and Patent Remedies. TEXAS LAW REVIEW, VOL. 85, P. 2111, 2007. Available at SSRN: <http://ssrn.com/abstract=991698>

<sup>138</sup> See Golden *ibid*, at p.

<sup>139</sup> See among others, *Amado v. Microsoft*, *Paice v. Toyota*, *MercExchange v. eBay*.

<sup>140</sup> See Jeremiah S. Helm, *Why Pharmaceutical Firms Support Patent Trolls: The Disparate Impact of eBay v. MercExchange on Innovation*, 13 Mich. Telecomm. Tech. L. Rev. 331 (2006), available at <http://www.mttl.org/volthirteen/helm.pdf>, describing examples of pharmaceutical companies acting like trolls in the sense of acting strategically including through the use of a threat to enjoin generic companies to avoid competition even when patents have expired. Compare with the European Commission Final *supra* note.

<sup>141</sup> See BESSEN AND MEURER 2008, at p. 123.

<sup>142</sup> See also Cotropia, Christopher Anthony and Lemley, Mark A., *Copying in Patent Law*. STANFORD PUBLIC LAW WORKING PAPER NO. 1270160. Available at SSRN: <http://ssrn.com/abstract=1270160>, arguing that “one of the most significant differences between patent law and other areas of intellectual property is that copying is

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recent studies have underlined the difficulties behind assessing the intention of infringement (willfulness in the U.S.), which is important for the purposes of calculating damages. The problem is also closely related to the recently acknowledged fact that a great number of infringement cases occur without intention but rather due to the difficulties of an optimal prior art search and the increasing complexity of patent landscapes filled with thickets and complex clusters of patents over adjacent technologies.

In the light of these facts, it is probably advisable to reject both the *a priori* identification of plaintiffs as presumed trolls and that of defendants as presumed infringers. If the controversy over hold-ups is rooted in the complexities of patent scope and the ambiguous results in the economic theory of patent improvement, as it has been recently argued<sup>143</sup>, most cases would actually reflect a tension between first and second innovators rather than a conflict between innovators v. infringers or trolls v. innovators. These reasons also weight in favor of maintaining a certain degree of discretion and flexibility for the issuance of injunctive relief.

Additionally, studies have suggested that often defendants (presumed infringers) are firms that invest hugely in R&D, in contrast with the image of firms stealing other firm's property and/or free riding on other's innovation. Actually some of those presumed infringers have invested more on R&D than their plaintiffs in infringement suits<sup>144</sup>, as it was argued in the case of manufacturer of the *Blackberry* device, RIM, which had allegedly much more in R&D its counterpart NTP even before knowing about the existence of the NTP's patents. Furthermore, in many cases including this, patents have been subject to re-examination but in most cases, the decision on infringement including preliminary and final measures is independent from re-examination procedures. All these reasons point towards the potential disruptive consequences from an injunction on patents that might be eventually held invalid and that are often developed independently by firms making important investments in R&D.

In this sense, arguments in favor of awarding injunctive relief for NMEs when these are research institutes or universities due to the fact that such entities invest in R&D and hence the bargaining power they exercise would in any case be necessary to recover their investments as well as being the basis for further R&D investments<sup>145</sup> could be likewise applied to defendants that have invested on R&D and are the object of hold-ups. Empirical studies have in fact showed that higher expenditures in R&D are associated with a higher probability of being sued for infringement<sup>146</sup>. Moreover, studies have found that most

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irrelevant to the determination of infringement". See Stephen M. Maurer & Suzanne Scotchmer, *The Independent Invention Defence in Intellectual Property*, 69 *ECONOMICA* 535 (2002).

<sup>143</sup> See Cotter, 2008 arguing that disagreement about hold-ups was due to an underlying disagreement about the economics of patent improvement and citing the pioneering work of Merges, Rober, *On the Complex Economics of Patent Scope*,

<sup>144</sup> See BESSEN AND MEURER 2008, p. 123 quoting from Bessen and Meurer 2006

<sup>145</sup> A similar reasoning was developed by the circuit court in the case of *CSIRO v. Buffalo*, which argued that CSIRO should be entitled to an injunction as it is a center that invested in R&D activities:

<sup>146</sup> BESSEN AND MEURER, 2008, p 124.

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infringers do not usually attempt to hide their infringing products, as one would expect if infringement were willful, and that only in a very small portion of cases -around 4% in the U.S.- have defendants been found to have willfully infringed<sup>147</sup>. These data is supportive of the thesis, sustained by some scholars, that it is inadvertent infringement more than intentional infringement that drives most litigation<sup>148</sup>. In practice, again, the fact that either the defendant or the plaintiff might invest in R&D, should only weight in favor of rejecting a categorical *a priori* identification of both defendants and plaintiffs rather than suggesting which party should patent policy irrefutably favor.

### 4.1.2. Evolution of patent strategic behavior

Another reason why defining firms as “patent trolls” or NMEs would not be useful to weed out hold-ups without incurring in significant costs and errors is that even if one such category was sufficiently homogenous at present, it would be likely to evolve rapidly. As a consequence, any policy measure targeting a similar category of patentees would most probably fail. The reason is that entities anticipating such policy responses would probably mutate their strategies and change their business model, licensing practices and any other factor taken into consideration by courts in order to avoid any policy response.

In fact, there are historical examples of strategic behavior put in place at different periods of time by different types of entities although with the use of similar litigation and patenting strategies. An example has been drawn from the U.S. agricultural sector following the creation -first by the U.S. Patent Office and then on the patent statute- of a new type of design patents during the 1860s, which was meant to provide incentives for incremental innovations. In practice, this reform is said to have lowered the bar for the patentability of such designs and opened the door for an important increase in the number of applications. As a commentator explains, “patent sharks” -as they were named at the time- bought inactive patents, mainly in the agricultural field, in order to sue inadvertent farmers who were using such patented products<sup>149</sup>. At that time, the practice was criticized on grounds similar to those used now with respect to patent trolls<sup>150</sup>. Moreover, patent sharks presumably emerged due to reasons comparable to those nourishing the emergence of patent trolls nowadays:

“Opportunistic licensors flourish when there is a large gap between the cost of getting a patent and the value that can be captured with an infringement action. This sort of arbitrage is likely to occur when: (1) those being sued cannot easily substitute away from

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<sup>147</sup> See also Re Seagate

<sup>148</sup> See BESSEN AND MEURER at p. 124, arguing that: “this pattern is entirely consistent with the inadvertent-infringement explanation -the more a firm invests in technology, the more it inadvertently exposes itself to patents of which it is not aware”. See also Cotropia, Christopher Anthony and Lemley, Mark A. *supra* note 142.

<sup>149</sup> See Magliocca, Gerard N., Blackberries and Barnyards: Patent Trolls and the Perils of Innovation. *Notre Dame Law Review*, June 2007. Available at SSRN: <http://ssrn.com/abstract=921252>

<sup>150</sup> *Ibid* at p: “At that time, the growth of sharks was blamed on excessive patent remedies, incompetent examiners, and the lack of compulsory licensing”

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the disputed technology; (2) the average scope of improvements in the industry is incremental, which makes the outcome of infringement litigation hard to gauge; and (3) the cost of acquiring and retaining patents is low<sup>151</sup>

The menace of patent sharks was finally tackled through the elimination of the design patents that made it possible their emergence. Although the situation was different from to the multi-component and abstract nature of modern patents, some insights can still be learned for the purposes of today's challenges. Recent scholar commentary suggests that any patent reform would encounter significant opposition given that the problem of patent trolls is confined to a particular type of patents. In the case of the modern controversy about patent trolls the more problematic sectors are business method and software patents or more in general abstract patents of growing technological sectors as information and communication technologies and biotechnologies<sup>152</sup>:

“any proposal affecting substantive rights is a non-starter because most patentees are not susceptible to holdups. Whether this is just a fact of interest-group politics or a principled stance that remedies should be tailored to fit harms, the point flows directly from the observation that only some types of patents are exposed to opportunistic licensors. In the *eBay* case discussed earlier, the effort to convince the Court to restrict injunctive relief (a form of compulsory licensing) was met with a stack of hostile amicus briefs from groups like the pharmaceutical industry that do not fear trolls. Similarly, the bills that are languishing in Congress seek to stop opportunistic licensing by overhauling standards on willful infringement and injunctive relief while altering the examination process by allowing third parties to challenge patents in an administrative proceeding<sup>153</sup>.”

Another similar practice to that employed by patent trolls, in the sense of exploiting the unawareness of potential infringers about an existent patent, was used for a long time by so-called “patent submarines”, which kept patents from being published during a long period of time following the application<sup>154</sup>. Such practice was possible according to U.S. law, where a continuation could be filed for a patent whereas the first application could be finally abandoned. Strong incentives to hide applications were importantly present when the duration of a patent was calculated from the time of issuance since the system allowed patents to remain secret until they that time. Hence, the issuance was susceptible of being delayed as long as the applicant kept on filing successive patent continuations.

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<sup>151</sup> Ibid at p. 6.

<sup>152</sup> Ibid at p. discussing alternative reforms suggested at that time and why they possibly failed, and making the interesting point that one important reason why other alternative policy changes failed were the opposition of groups, especially of patent holders of other technologies, which lobbied against any such reform. In particular, some proposals for compulsory licensing were put forward. See *ibid* at footnote 98, quoting from 45 CONG. REC. 398 (1878) (statement of Sen. Christiancy) (“There is still another class of cases in which, for patents hereafter to be issued, to prevent extortion, some rate of compensation should be fixed by the statute ... when the infringement consists in using the thing patented.”).

<sup>153</sup> Ibid at p. 51.

<sup>154</sup> The term patent submarine often refers to the patent in question, whereas the entity or individual engaging in such practice is also named a “troll” or “shark”. Harhoff et al. Final Report, 2007, at p. 95

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Several solutions were proposed to avoid patent submarines. In fact the patent reform that extended the duration of patents from 17 year from the issuance to 20 from the application lowered the incentives for hiding applications but not necessarily for filing continuations<sup>155</sup>. In 2001 an additional reform was needed to make the publication of patents mandatory after 18 months from the day of application. However, it is still possible to keep a patent application secret as long as the applicant declares that he does not intend to file patents in jurisdictions requiring publication after 18 months. The USPTO hence proposed a revision on the rules governing such practice targeted at avoiding the abuse of such practice<sup>156</sup>. The issue was subject to wide controversy and to the disagreement between industries holding different views about the convenience of patent continuations. The controversy then centered on whether the USPTO was competent to issue such rules that might affect substantive patent law and earlier this year, the Federal Circuit issued a permanent injunction against the implementation of the rules proposed by the USPTO<sup>157</sup>.

A potential approach to avoid the abuse on the practice of patent continuations is the use of equitable doctrines, for instance the doctrine of prosecution laches which allows declaring a patent unenforceable. This was the case in a land marking decision in which some patents hold by Jerome Lemelson<sup>158</sup> were held unenforceable:

"Jerome Lemelson, a prolific inventor with close to 600 patents, is renowned among patent lawyers as the master of "submarine" patents –patents kept hidden for many years-. Lemelson slowed the prosecution of his patents, sometimes for over twenty years. He waited until his technologies were independently invented and commercialized, and then he brought his patent to the surface and negotiated royalties after the potential licensees were locked into the patented technology. Although his patents covered breakthrough technologies as bar-code scanning, he did not contribute these breakthroughs to society"<sup>159</sup>

A drawback with the doctrine of prosecution laches and probably with other doctrines such as equitable estoppel and patent misuse would be that they are likely to be applied only on a subset of cases under strict requirements that do not often allow to balance all the circumstances of the case. In the case of prosecution laches, an additional requirement is that the inaction of the patentee takes place over an important number of years<sup>160</sup>.

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<sup>155</sup> Ibid at p. 95.

<sup>156</sup> See the "Proposed Changes to Practice for Continuing Applications, Requests for Continued Examination Practice, and Applications Containing Patentably Indistinct Claims, Notice of proposed rulemaking", available at: <http://www.uspto.gov/web/offices/com/sol/notices/71fr48.pdf>, last accessed on August 13, 2009.

<sup>157</sup> The Eastern District of Virginia issued an injunction against the implementation of the rules considering that they were substantive rather than just procedural and hence affected rights of the applicants under the Patent Act. However, in March 2009, on appeal before the Federal Circuit, this latter overturned the decision by the District Court, upholding several of the proposed rules. The controversy continues and on July 6, 2009, the Federal Circuit agreed to rehear the case *en banc*.

<sup>158</sup> *Symbol Technologies v. Lemelson* 301 F.Supp.2d 1147, 69 U.S.P.Q.2d 1738 (D.Nev. 2004)

<sup>159</sup> BESSEN AND MEURER, 2008, at p. 170.

<sup>160</sup> See Cotter, 2008 at p.

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Moreover, and as above mentioned, it is still possible for an applicant to avoid publication as long as the applicant does not seek the filling of applications outside the U.S. or under the Patent Cooperation Treaty. Given the size and importance of the U.S. market, in an important number of cases it could still be a rational and profitable strategy to keep applications hidden for as long as a potential infringer independently develops an infringing technology.

Finally, from an efficiency perspective, a rule that directly punishes trolls or NMEs would not be desirable. Such rule could be over-deterrent<sup>161</sup>, insofar as it could affect companies that presumably carry out efficient activities such as management and enforcement of patents. At the same time such rule could also be under-deterrent<sup>162</sup>, by failing to tackle the behavior of certain types of companies, which in spite of falling out of the definition of trolls, could nevertheless engage in trolling, e.g. universities or research centers and also manufacturing firms.

### **4.2. The conduct: Trolling behavior**

The definition of patent trolls does not encompass all cases involving potential losses in terms of static and/or dynamic efficiency and also unduly extends to cases beyond those losses. An alternative benchmark for courts to determine whether in a particular case, a plaintiff is taking advantage patent law doctrines to engage in hold-ups and any other similar type of inefficient strategic behavior is to focus on the conduct rather than on the entity that is engaging in such practice.

In fact, some scholars have already highlighted that the focus of study should not be “trolls” understood as entities but “trolling” understood as a behavior. Yet others insist on using the definition of patent trolls or argue for the use of both factors (trolls and trolling behavior) as appropriate benchmarks:

“determining whether a particular patent holder should be awarded an injunction demands a fact-specific inquiry that cannot be reduced to a rigid checklist. But two factors are most important in distinguishing patent holders entitled to an injunction from patent trolls that are not. The first is the nature of the entity. If it is an entity organized for the purpose of investing in litigation rather than innovation, a remedy at law is more than adequate to compensate any legitimate claims it might have. The second is whether the entity engaged in any strategic troll-like behavior designed to increase disproportionately

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<sup>161</sup> Error type 1, would happen under a rule that ends up in false convictions where a purported troll is engaged in efficient conduct.

<sup>162</sup> Error type 2, would happen under a rule that ends up in false acquittals where a non-troll engages in troll-like and hence, inefficient conduct.

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the settlement value of its claim. If such an entity set a trap for a productive firm, it should not be entitled to an injunction"<sup>163</sup>.

Moreover, and as explained above, "trolling" conduct can be defined as a hold-up. At the same time, hold-ups have been deeply analyzed by the law and economics literature and pertain to the broader concept of strategic behavior. Moreover, these types of conduct can also be identified from a legal point of view through a diverse set of conditions that might include objective elements as well as subjective elements denoting intention.

Objective elements might include some external factors as the type of technology patented and whether it constitutes a small or an important portion of a multi-component product and even if being a small portion, whether it is a core element of such product or just one trivial or minor element. Subjective elements understood as factors to analyze the hold-up intention of a plaintiff, might include considerations such as her past litigation pattern – using patents as instruments of extortion or as a "sword rather than a shield to protect innovations" – whether the patented technology was plainly suppressed due to financial hardships that made it difficult to commercialize such inventions or whether it was an intended suppression as well as the specific causes of suppression or non-working.

Although an often cited principle in patent law is that patentees are free to work or not, and even to suppress their patented technologies from the market, such considerations might still matter under a rule or reason, equitable doctrine or case-by-case examination. If the intention of suppressing a patent is to block competition in a technological area, patents could also be clearly in tension with competition laws<sup>164</sup>. Although it is often acknowledged that patents do not *per se* confer market power or do not pose any *a priori* anti-competitive concern, it is also well-known that the abusive exercise of a patent does. This will be the case if patent suppression comports the emergence of more efficient standards or technologies. From an economic point of view such blocking would be detrimental for the promotion of innovation incentives and hence for the overall goals of patent law as well as competition law. Even if such conduct cannot be deemed as contrary to antitrust statutes of a particular jurisdiction or in the particular circumstance of the case, such cases might still run counter to the goals of patent policy.

A leitmotiv of "trolling" and more in general of patent strategic behavior is precisely the intention of surprise that is present in the conduct of submarines, ambushes and trolls. Such surprise element of hold-ups has been already acknowledged by the CAFC as it:

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<sup>163</sup> Brief of *Amicus Curiae* Yahoo! Inc. as Supporting Petitioners, in *eBay, Inc. v. MercExchange, L.L.C.*, 126 S. Ct. 1837 (2006), No. 05-130, available at: <http://patentlaw.typepad.com/eBay/eBayYahoo.pdf>, last accessed on August 11, 2009. Compare Lemley, 2008, *supra* note, focusing on trolling behavior with Merges arguing that both factors are important for a court to determine whether a patentee deserves an injunction.

<sup>164</sup> Does the cause of suppression matter? See Roger Blair and Thomas Cotter, *Rethinking Patent Damages*, 10 TEXAS INTELLECTUAL PROPERTY LAW JOURNAL, 1, 74-84 (2001)

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“obliges the producer to pay [the patent holder] as much as it would cost to shift to a noninfringing product, an amount, given investment in infringing systems, perhaps far more than a reasonable royalty [as determined preinvestment]. These incentives ... encourage patentees to adopt a strategy of ambush rather than providing fair notice<sup>165</sup>.”

The above mentioned subjective or objective elements to judge the occurrence of troll-like behavior are not easy to discern. But they are neither impossible for courts to assess, especially given that some of the factors that explained below with regards to patent hold-ups, such as willfulness of the conduct, likelihood of inadvertent infringement, cost of redesigning and impact of the patented technology on the infringing product, among others, are already considered –at least by U.S. courts- when calculating reasonable royalties and more recently within the application of the four-factor test to award or deny injunctive relief.

Moreover, and as we have sustained, trolling behavior is neither a new nor the sole basis calling for the application of case-by-case reasoning to deny injunctive relief or opting for the use of other type of *ex-post* liability rules. In fact, since the times of the first major harmonized instrument for patent law, the Paris Convention, it was precisely the concept of patent abuse that provided one of the most important bases for switching into such rule<sup>166</sup>. Legal provisions around the world have sanctioned different conducts as abuse, misuse, anti-competitive uses of patents as well as other similar grounds, which in an economic sense, might correspond with the concept of strategic behavior.

Economic analysis has the further task of identifying the effects of such rules and helping to determine when such behavior shall be corrected through the use of a liability rule. Among other questions it is important to analyze whether there might be any anti-competitive effects affecting consumers or whether it is only competitors that are affected for such practices. Even if only competitors are affected for such practices, however, it is still possible that competitors have developed second or improved innovations and hence the use of first innovations under a liability rule would still be socially beneficial. This factor could be based upon whether strategic behavior causes dynamic losses, static losses or both and in which cases it should be liable in accordance to such different losses. Additionally it is also important to consider the suggestions of economic analysis about a proper definition of patent abuses and whether such definition(s) overlaps or complements those of antitrust law and unfair competition statutes.

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<sup>165</sup> See *Odetics, Inc. v. Storage Technology Corp.*, 185 F.3d 1259, 1273 (Fed. Cir. 1999) See also Brief Amici Curiae Yahoo, *supra* note, 162 and Note, *The Disclosure Function Of The Patent System (Or Lack Thereof)*, 118 Harv. L. Rev. 2007, 2024 (2005).

<sup>166</sup> Under the well known standards of article 5-A (2) of the Paris Convention “Each country of the Union shall have the right to take legislative measures providing for the grant of compulsory licenses to prevent the abuses which might result from the exercise of the exclusive rights conferred by the patent, for example, failure to work”. Such provision is further subject to the requirements of article 31 of the TRIPS Agreement, which nevertheless left ample space for the implementation of compulsory licenses to correct the aforesaid abuses.

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## Conclusions

This paper sought to enhance the view on patent strategic behavior that has been the object of much academic and policy discussion. Whereas the patent landscape is continuously mutating and players use the patent system to maximize profits, there are important legal rules to control for abuses of the patent system. One possibility is to choose between protecting a patent through a property or a liability rule. Whereas law and economics studies justify the use of liability rules in the presence of high transaction costs including strategic behavior, recent discussions have tended to focus only on the purported problem of hold-ups as it occurred in some notorious cases in the U.S. and others have subsequently narrowed the concept of hold-ups to highly restrictive assumptions.

This paper provided a brief overview of the case law addressing these problems in the U.S. and some of the latest findings about the European landscape as well as the conclusions of a general inquiry in the European Pharmaceutical Sector. The purpose of studying these cases was to show the changing dynamics of different industries and the multiple ways in which patent strategic behavior can materialize.

For the above mentioned reasons, while many studies have focused on the figure of patent trolls to understand the recent emergence of a sub-type of strategic behavior where firms use their patents in order to extract large settlements, the paper argues in favor of centering the discussions on the conduct –strategic behavior- rather than on the entity carrying out such conduct.