



**Stanford – Vienna
Transatlantic Technology Law Forum**

*A joint initiative of
Stanford Law School and the University of Vienna School of Law*



TTLF Working Papers

No. 22

**The Treatment of Software Patent Pools
under the United States Antitrust and the
European Union Competition Laws**

Katarina Mikolajova

2016

TTLF Working Papers

About the TTLF Working Papers

TTLF's Working Paper Series presents original research on technology-related and business-related law and policy issues of the European Union and the US. The objective of TTLF's Working Paper Series is to share "work in progress". The authors of the papers are solely responsible for the content of their contributions and may use the citation standards of their home country. The TTLF Working Papers can be found at <http://tflf.stanford.edu>. Please also visit this website to learn more about TTLF's mission and activities.

If you should have any questions regarding the TTLF's Working Paper Series, please contact Vienna Law Professor Siegfried Fina, Stanford Law Professor Mark Lemley or Stanford LST Executive Director Roland Vogl at the

Stanford-Vienna Transatlantic Technology Law Forum
<http://tflf.stanford.edu>

Stanford Law School
Crown Quadrangle
559 Nathan Abbott Way
Stanford, CA 94305-8610

University of Vienna School of Law
Department of Business Law
Schottenbastei 10-16
1010 Vienna, Austria

About the Author

Katarina Mikolajova is a Senior Advisor of the State at the Antimonopoly Office of the Slovak Republic. She earned her LL.M. with Distinction in European and International Business Law at the University of Vienna in 2014 and her LL.B. (Hons) in European, International and Comparative Law together with the Sheffield Graduate Award and the Enterprise Skill Build Certificate at the University of Sheffield in 2011. As part of her LL.B., she spent a year abroad as an exchange student at the University of Toulouse and the University of Vienna. Previously, Katarina worked at Howells Solicitors LLP in Sheffield, at Derains & Gharavi in Paris and volunteered at Pitsmoor Citizens Advice Bureau in Sheffield as a Generalist Advisor, for which she was awarded a level 2 OCN Certificate in Advice Skills at Work. She is also a qualified and experienced professional interpreter and holder of a Diploma in Public Service Interpreting from the Chartered Institute of Linguists in England.

General Note about the Content

The opinions expressed in this student paper are those of the author and not necessarily those of the Transatlantic Technology Law Forum or any of its partner institutions, or the sponsors of this research project.

Suggested Citation

This TTLF Working Paper should be cited as:
Katarina Mikolajova, The Treatment of Software Patent Pools under the United States Antitrust and European Union Competition Laws, Stanford-Vienna TTLF Working Paper No. 22, <http://tflf.stanford.edu>.

Copyright

© 2016 Katarina Mikolajova

Abstract

The paper conducts a comparative analysis of the treatment of software patent pools under the U.S. antitrust and EU competition law. The topic lies at the intersection of several areas of law, including IT, IP, antitrust and competition law – none of which cover software patent pools in particular. These areas have also recently been the subject of exciting changes. An exploration of the potential impact of these changes, including the decision of the Supreme Court of the U.S. in *Alice* on patentability of software in the U.S. and the new EU competition regime for the assessment of technology transfer agreements in the EU, is attempted.

The following research methodology is adopted: First, the paper explores the particularities of software in Section 1, with a special emphasis on patentability and innovation, while the U.S. and the EU approaches are compared and analyzed. The effects of software patents and the particularities of innovation in software on antitrust and competition law are examined in this section as well. Section 2 introduces patent pools. It defines patent pools, the reasons for their creation and their competitive advantages and disadvantages. Patent pools are then critically analyzed in light of the antitrust and competition regulation they are subject to in the U.S. and the EU respectively. Section 3 then links the findings from Section 1 and Section 2 in order to assess whether pooling could improve or exacerbate the competitive concerns of software patents. The conclusion summarizes the findings and offers some proposals for the improvement of software patent pools' regulation.

The research indicates that software possesses particularities that originate from the way software is patented and the way innovation happens in the software industry. These particularities distinguish software from other types of technology and are competitively relevant. Patent pooling was devised primarily to deal with one of the competitive issues of patents – the thickets. However, even though the central aim is to remedy an anticompetitive situation, the formation and functioning of patent pools can also give rise to anticompetitive concerns. When the patents in the pool are software ones, the particularities of software can have an influence on the competitiveness of the patent pools in question.

The proposed improvements of software patent pools regulation include reforms of patent law, antitrust/ competition law and a more focused scrutiny of software patent pools in particular.

Table of Contents

Table of Contents.....	1
List of Abbreviations.....	4
Introduction.....	6
1. Particularities of Software Relevant to Antitrust/ Competition.....	8
1.1. Software and Patent Law in the U.S.....	8
1.2. Software and Patent Law in the EU.....	15
1.3. Comparison and Analysis of the Two Systems.....	18
1.4. Software Patents, Innovation and Antitrust/ Competition.....	19
1.4.1. <i>Software Patents Are Too Numerous and Too Broad</i>	19
1.4.2. <i>Thickets</i>	23
1.4.3. <i>Patent Trolls</i>	25
1.4.4. <i>Fast Innovation, Slow Patenting</i>	27
1.4.5. <i>Individuals and Start-ups are the Drivers of Innovation</i>	28
1.4.6. <i>Nature of Inventive Process in the Software Industry</i>	30
2. Patent Pools and Their Regulation under the U.S. Antitrust and EU Competition Laws.....	32
2.1. Definitions of Patent Pools and Reasons for Their Creation.....	32
2.2. Efficiencies and Competitive Concerns of Patent Pools.....	33
2.3. Patent Pools and Antitrust in the U.S.....	37
2.3.1. Relationship between Pooled IP Rights.....	39
<i>Substitutes v. Complements</i>	39
<i>Essential v. Non-essential Patents</i>	40
2.3.2. Overall Licensing Agreement and Individual Restraints.....	41

<i>Exclusive Licensing</i>	41
<i>Grantbacks</i>	42
<i>Royalties</i>	43
<i>Partial Pool Licenses</i>	44
2.3.3. Risk of Collusive Behavior and Safeguards.....	44
<i>Sharing Sensitive Information</i>	45
2.4. Patent Pools and Competition in the EU.....	45
2.4.1. Safe Harbor.....	46
2.4.2. Art. 101 (1).....	47
a) Relationship between Pooled IP Rights.....	47
<i>Substitutes v. Complements</i>	47
<i>Essential v. Non-essential Patents</i>	47
b) Overall Licensing Agreement and Individual Restraints....	48
<i>Exclusive Licensing</i>	48
<i>Grantbacks</i>	49
<i>Royalties</i>	49
<i>Partial Pool Licenses</i>	49
c) Risk of Collusive Behavior and Safeguards.....	49
<i>Sharing Sensitive Information</i>	49
2.4.3. Art. 101 (3).....	49
2.5. Comparison and Analysis of the Two Systems.....	50
3. Software Patent Pools and Antitrust/ Competition.....	52
3.1. Software Patents Are Too Numerous and Too Broad.....	52
3.2. Thickets.....	55

3.3. “Patent Trolls”.....	56
3.4. Fast Innovation, Slow Patenting.....	56
3.5. Individuals and Start-ups are the Drivers of Innovation.....	57
3.6. Nature of Inventive Process in the Software Industry.....	57
Conclusion.....	59

List of Abbreviations

Antitrust-IP Guidelines	Antitrust Guidelines for the Licensing of Intellectual Property
Art.	Article
BER	Block Exemption Regulation
Cl.	Clause
DoJ	Department of Justice
e.g.	Exempli Gratia
EC	European Commission
ECJ	European Court of Justice
EPC	European Patent Convention
EPO	European Patent Office
etc.	Et Cetera
EU	European Union
FRAND	Fair, Reasonable and Non-discriminatory
FTC	Federal Trade Commission
i.e.	Id Est
IP	Intellectual Property
MS	Member States
NPE	Non-practicing Entity
Par.	Paragraph
R&D	Research and Development
TEU	Treaty on European Union
TFEU	Treaty on the Functioning of the European Union

TT Guidelines	Technology Transfer Guidelines
TTBER	Technology Transfer Block Exemption Regulation
U.S.	United States of America
UPC	Unified Patent Court
U.S.C.	United States Code
USPTO	United States Patent and Trademark Office

Introduction

Is the current patent system ill-suited for today's rapidly changing, high-tech world? Is the system being misused, with resulting anti-trust implications? Is patent pooling a solution or does it exacerbate the problems? And what, if any, difference does it make when the pools in question are composed of software patents?

The paper does not seek to provide definitive answers. Rather, it attempts to explore an intriguing topic that has not received a lot of attention from either legislators or academics. The topic lies at the intersection of several areas of law, including IT, IP, and antitrust and competition law—a place where these legal regimes both conflict and cooperate.¹ However, none of these areas cover software patent pools in particular. Antitrust and competition law only deal with patent pools in general, while patent law only deals with software patents. Therefore, both areas have to be analyzed in order to understand the current regulation of software patent pools.

These areas have recently been the subject of exciting changes. On March 21st, 2014 the EC adopted new competition rules for the assessment of technology transfer agreements,² which came into effect on May 1st, 2014 and made important changes to the assessment of patent pools in the EU. On June 19th, 2014 the Supreme Court of the U.S. issued a landmark decision on the

¹ There is an inherent tension between IP and antitrust (competition), where the former confers exclusive rights on the owner (in effect granting him a monopoly), while the latter exists to keep the markets open (and therefore, to avoid monopolisation). However, both areas share the same fundamental aims—to protect innovation.

² The new Technology Transfer Block Exemption Regulation (TTBER): Commission Regulation 316/2014 on the Application of Article 101 (3) of the Treaty on the Functioning of the European Union to Categories of Technology Transfer Agreements, 2014 O.J. (L93) 17; and the new Technology Transfer Guidelines (TT Guidelines): Commission Communication, Guidelines on the Application of Article 101 of the Treaty on the Functioning of the European Union to Technology Transfer Agreements, 2014 O.J. (C89) 03.

patentability of software³, which is already having a massive impact in the U.S. Both these developments directly affect the topic of this paper and are therefore taken into account in the analysis below.

The following research methodology is adopted: First, the paper explores the particularities of software in **Section 1**, with a special emphasis on patentability and innovation, while the U.S. and the EU approaches are compared and analyzed. The effects of software patents and the particularities of innovation in software on antitrust and competition law are examined in this section as well. **Section 2** introduces patent pools. It defines patent pools, the reasons for their creation and their competitive advantages and disadvantages. Patent pools are then critically analyzed in light of the antitrust and competition regulation they are subject to in the U.S. and the EU respectively. **Section 3** then links the findings from Section 1 and Section 2 in order to assess whether pooling could improve or exacerbate the competitive concerns of software patents. The conclusion summarizes the findings and offers some proposals for the improvement of software patent pools' regulation.

³ *Alice Corp Pty Ltd v. CLS Bank International*, 573 U.S. ___, 134 S. Ct. 2347 (2014).

1. Particularities of Software Relevant to Antitrust and Competition

Certain characteristics of software distinguish it from other types of technology. Some of these particularities are not competitively neutral—they have an influence on antitrust/competition. These particularities and their possible influence on antitrust/competition are analyzed below.

First and foremost, it is necessary to look at patentability of software—how software patents come to be. There are two main objectives behind patenting in general:

- 1) Informing the public of the invention.
- 2) Incentivizing innovation through rewarding the creator.

These objectives are also shared by antitrust/competition. However, patent law and antitrust/competition pursue these objectives in different ways. Patent law affords the patent holder a monopoly—a sort of “break” from competition—which allows him or her to exclude others from making, manufacturing, using, or selling the invention for 20 years. This is so even if others invent the invention independently.

Let us see whether patent law’s way of pursuing these objectives is effective.

1.1. Software and Patent Law in the U.S.

Software or computer programs are not explicitly mentioned in the U.S. statutes on patent law⁴, but the general patent law applies to them. The basis of U.S. patent law can be found in the U.S. Constitution, which grants Congress the power to "promote the Progress of Science and useful Arts, by securing for

⁴ Sherly E. Abraham, *Software patents in the United States: A balanced approach*, 25(6) Computer L. Rev. & Tech. L.J., 554 (2009).

limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”⁵ Congress responded by passing the Patent Act of 1790,⁶ establishing the current patent system. Section 101 of the Patent Act of 1790 provides that an inventor of “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement therefore” may patent that invention. The requirements for patentability therefore are:

1. Patentability of subject matter⁷
2. Utility⁸
3. Novelty⁹
4. Non-obviousness.¹⁰

As the statute does not deal with software in particular, we have to turn to the case law to find out whether software could fulfill the requirements. However, the U.S. courts have fumbled in the dark for a definition. The Supreme Court has asked Congress for help on several occasions, but to no avail.¹¹ This could explain the lack of clear guidance we see from the courts now and again and the confusing state of software patent law throughout the decades.

Since 1853, case law excludes laws of nature, mathematical and scientific principles, mental processes, and abstract ideas from patent protection.¹²

However, does this exclude software?

⁵ U.S. Const. art. I, § 8, cl. 8.

⁶ 35 U.S.C. §§ 1 - 376.

⁷ 35 U.S.C. §101.

⁸ 35 U.S.C. §101.

⁹ 35 U.S.C. §102.

¹⁰ 35 U.S.C. §103.

¹¹ E.g. *Bilski v. Kappos*, 561 U.S. 593 (2010) at 3228.

¹² E.g. *O'Reilly v. Morse* 56 U.S. (15 How.) 62 (1853).

The first case from the “Patent Eligibility Trilogy” cases that dealt with the patentability of software in particular was the 1972 *Gottschalk v. Benson*¹³ decision. Benson applied for a patent on a method for transforming binary coded decimals to pure binary form, but was rejected. As Benson’s invention could be characterized as a mental process, abstract idea or a mathematical principle, the Supreme Court held that it was excluded from patent protection and thus clarified the previously accepted position that software as such is not patentable. The case relied on the reasoning that if a process was carried out with a physical apparatus or involved a transformation from one physical state to another, then the process was patentable.¹⁴

The Court also adopted this reasoning in *Parker v. Flook*¹⁵, where the Supreme Court rejected an application to patent a method for calculating and updating an alarm limit in a chemical process in an oil refinery, as the only departure from the prior art was the algorithm.

However, in 1981 the Court issued a famous decision in *Diamond v. Diehr*¹⁶, which opened the gates for software patents in the U.S. The case involved a process for curing rubber, which involved a computer program that continuously calculated temperatures inside the mold to determine when the rubber was properly cured. The Court held that the execution of a physical process, controlled by running a computer program, was patentable. According to the Court, software algorithms could not be patented but an otherwise patentable

¹³ *Gottschalk v. Benson*, 409 U.S. 63 (1972).

¹⁴ *Ibid* at p. 71.

¹⁵ *Parker v. v. Flook*, 437 U.S. 584 (1978).

¹⁶ *Diamond v. v. Diehr*, 450 U.S. 175 (1981).

invention did not become unpatentable simply because a computer was involved. In *Diehr*, there was a transformation—from uncured to cured rubber.

After the designation of the Court of Appeals for the Federal Circuit in 1992 as the specialized forum for patent disputes, *Diamond v. Diehr* has been interpreted broadly and inconsistently.

For example, in the *In Re Alappat* case¹⁷ the Court of Appeals for the Federal Circuit ruled that a programmed general purpose computer becomes a new machine once software is loaded into memory, making it eligible for patent protection. In simple terms, a novel algorithm combined with a trivial physical step constitutes a novel physical device.

The *State Street Bank* case¹⁸ went even further in this slide down the proverbial slope. The case involved a financial services company with a system that utilized software to manage mutual funds, which they managed to get successfully patented. The the Court of Appeals for the Federal Circuit developed the “useful, concrete and tangible result” test—if a numerical calculation produced a useful, concrete and tangible result, it could be patented. *State Street Bank* opened the floodgates for software and business method patent applications and several curious ones have been granted, including “the *Amazon One-Click Patent*”¹⁹—a method and system for placing a purchase

¹⁷ *In Re Alappat*, 33 F.3d 1526, 31 U.S.P.Q.2d (BNA) 1545 (Fed. Cir. 1994).

¹⁸ *State Street Bank and Trust Company v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998).

¹⁹ Method and system for placing a purchase order via a communications network, U.S. Patent No. 5960411 (A), (filed Sept. 12th, 1997).

order via a communications network—considered the most controversial software patent to date.²⁰

The situation lasted largely unchanged until 2006 when the first Supreme Court criticism appeared.²¹ But it was not until 2009 that the Court of Appeals for the Federal Circuit decided to narrow the test down in the *In re Bilski* case²². The case involved a business method patent, and by establishing a new test essentially superseded *State Street Bank*. The test the the Court of Appeals for the Federal Circuit used in *In re Bilski* for subject matter eligibility was the “machine or transformation test”, under which a method claim will be invalid unless it is tied to a particular machine or apparatus, or it transforms a particular article into a different state or thing. However, the case went to the Supreme Court²³, which overturned the decision of the Court of Appeals for the Federal Circuit and held that the “machine or transformation” test is too narrow and is not the sole test for patentability under §101. It also held that while there is no general business method exemption to subject matter eligibility, the claimed method at issue in *Bilski* was ineligible as it was “an abstract idea”. Therefore, method claims related to software algorithms were still patentable, as long as they fulfilled the test of “not being an abstract idea”—a concept that continues to spur debate.

²⁰ Asher Wilk, *Patentability of Software*, SWSTE, Software Science, Technology and Engineering, IEEE International Conference on Software Science, Technology and Engineering, pp. 30-39, at p. 35, (2012).

²¹ See e.g. Justice Breyer's dissent in *Lab. Corp. of Am. Holdings (LabCorp) v. Metabolite Labs., Inc.*, 126 S. Ct. 2921, 2922–23 (2006) or Justice Kennedy's opinion (joined by Justices Stevens, Souter, and Breyer) in *eBay Inc. v. MercExchange, L.L.C.* 547 U.S. 388 (2006).

²² *In re Bilski*, 545 F.3d 943, 88 U.S.P.Q.2d 1385 (Fed. Cir. 2008).

²³ *As Bilski v. Kappos*, 561 U.S. 593 (2010).

The latest Supreme Court guidance on the subject came on June 19th, 2014 in *Alice Corporation v. CLS Bank International*,²⁴ a landmark case on the question of whether an escrow function, performed by a general-purpose computer, could be patented. The Court held that "merely requiring generic computer implementation fails to transform [an] abstract idea into a patent-eligible invention" and invalidated the patents.

Since the decision, lower courts have interpreted *Alice* to invalidate software patents on subject matter grounds in thirteen cases at the time of writing.²⁵ This alone is almost as many cases as in 2013 where the courts invalidated fourteen software patents on subject matter grounds, and almost twice as many as 2012 when there were only seven such cases.²⁶ This trend has led many to ask whether *Alice* is the start of the software patents' doom.²⁷ However, there is no clear answer. The court's ruling has not been praised for certainty and, as Robert Merges points out, all computer programs perform sequences of mathematical operations that could—in principle—be performed by a human being.²⁸ However, while it is likely that the majority of software patents litigated after *Alice* will be found invalid, *Alice* most likely does not mean invalidity for *all* software patents.

²⁴ *Alice Corp Pty Ltd v. v. CLS Bank International*, 573 U.S. ___, 134 S. Ct. 2347 (2014).

²⁵ See e.g. *Comcast IP Holdings I, LLC v. Sprint Communications Company L.P., et al.*, C.A. No. 12-205-RGA (D. Del. July 16th, 2014).

²⁶ Timothy B. Lee, *Software patents are crumbling, thanks to the Supreme Court*, Vox, available at <http://www.vox.com/2014/9/12/6138483/software-patents-are-crumbling-thanks-to-the-supreme-court> (last accessed October 15th, 2014).

²⁷ See e.g. Richard H. Stern, *Alice v. CLS Bank: US Business Method and Software Patents Marching towards Oblivion?*, Eur. Intell. Prop. Rev. 619, 626, (2014); or Richard H. Stern, *Alice v. CLS Bank: Are US Business-Method and Software Patents Doomed?*, Part 1, IEEE Micro, Sept./Oct. (2014).

²⁸ Robert P. Merges, *Symposium: Go ask Alice — what can you patent after Alice v. CLS Bank?*, SCOTUSblog (Jun 20th, 2014, 12:04 PM), available at <http://www.scotusblog.com/2014/06/symposium-go-ask-alice-what-can-you-patent-after-alice-v-cls-bank/> (last accessed October 15th, 2014).

Some argue that *Alice*, just like *Bilski*, has missed the opportunity to create clear limits to statutory subject matter element of a patent and did little more than overturn a bad patent. However, even these “baby steps” have made a much needed impact, as evidenced by the increasing numbers of software patents being invalidated on subject matter ineligibility. Moreover, in an ever more connected world, the disharmonized nature of the patent systems is harmful. We are still a long way off, especially in the EU, but both *Bilski* and *Alice* have arguably brought the U.S. system closer to that of the EU. And while the EU system is not without faults, and therefore not to be used as a template for the reform in the U.S.²⁹, the sections below attempt to show that the shortcomings of the U.S. system are much graver than those of the EU.

There has been some political will to reform software patent law. The Leahy-Smith America Invents Act (AIA) of 2011³⁰, making the most significant changes to the U.S. patent laws since the Patent Act of 1952³¹, was adopted to address patent law issues in the U.S. It does not deal with software methods specifically, but significantly affects all patent issues, especially business-method patents, lawsuits by NPEs, and patents in which the USPTO may not have had certain relevant prior art during prosecution (such as those involving software).³² However, it has been criticized for not going far enough to incorporate the

²⁹ As the SCOTUS recognised in *Bilski*.

³⁰ Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (codified in scattered sections of 35 U.S.C.).

³¹ Act of July 19th, 1952, ch. 950, 66 Stat. 792, codified as Title 35 of the U.S.C.

³² Robert E. Yoches, Esther H. Lim, Christopher S. Schultz, Linda J. Thayer & Erika Harmon Arner, *How Will Patent Reform Affect the Software and Internet Industries?*, *The Computer & Internet Lawyer*, December 2011, Volume 28, Number 12, p. 5–14 (2011).

recommendations of the 2003 FTC report³³ and a 2004 National Academy of Sciences publication.³⁴ Most of the criticisms aimed at the patent system pre-AIA therefore still remain.³⁵

1.2. Software and Patent Law in the EU

As opposed to the U.S. law, computer programs are expressly mentioned in the EU legislation. The European Patent Convention (EPC)³⁶ sets out the requirements for patentability in its Art. 52 (1), which are essentially the same as in the U.S., the only differences being in the wording rather than the substance:

1. Patentability of subject matter
2. Susceptibility of industrial application (equivalent to “usefulness” in the U.S.)
3. Novelty
4. Involvement of an inventive step (equivalent to “non-obviousness” in the U.S.)

However, Art. 52 (2) excludes from patentability the following:

1. discoveries, scientific theories and mathematical methods;
2. aesthetic creations;

³³ Federal Trade Commission, A Report by the Federal Trade Commission, *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy*, (October 2003), available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf> (last accessed October 15th, 2014).

³⁴ Stephen A. Merrill & Richard C. Levin & and Mark B. Myers, *A Patent System for the 21st Century* (ed., Committee on Intellectual Property Rights in the Knowledge-Based Economy, National Research Council, 2004).

³⁵ See e.g. William Rose, *Calming Unsettled Waters: A Proposal For Navigating The Tenuous Power Divide Between The Federal Courts And The USPTO Under The America Invents Act*, Wm. & Mary Bill Rts. J. 22.2, 613-645, (2013).

³⁶ Convention on the Grant of European Patents, October 5, 1973, 13 Int'l Legal Mats. 268 (1974) (hereinafter cited as EPC).

3. schemes, rules and methods for performing mental acts, playing games or doing business, and *programs for computers*;
4. presentations of information.

While this would seem to exclude computer programs from patentability point-blank, Art. 52 (3) adds: "Paragraph 2 shall exclude the patentability of the subject-matter or activities referred to therein only to the extent to which a European patent application or European patent relates to such subject-matter or activities *as such*."

The expression "as such" has been the root of controversy, generating considerable uncertainty and confusion and thus has created the need for clarification by case law. The EPO has interpreted the words to mean that, in addition to the requirements from Art. 52 (1), the provision of a technical solution to a technical problem is needed for an invention to be patentable.³⁷ This is in contrast with the situation in the U.S., where such a requirement is not necessary.³⁸

To better understand what is meant by technical character, it is necessary to take a closer look at the relevant EU case law. The approaches, however, vary and there is still no generally accepted definition as of yet.

In *VICOM*³⁹ it was held that the technical character requirement is met where the invention involves a technical contribution to prior art. In *VICOM* this meant

³⁷ See e.g. Case T-0928/03, Video game/KONAMI, 2006, not published in O.J. EPO, available at <http://www.epo.org/law-practice/case-law-appeals/pdf/t030928eu1.pdf> (last accessed July 15th, 2015).

³⁸ For further information on how and why the EPO rejected the U.S. approach, see Case T-258/03, Auction Method/Hitachi, 2004 O.J. EPO 75, available at <http://www.epo.org/law-practice/case-law-appeals/pdf/t030258ep1.pdf> (last accessed July 15th, 2015).

³⁹ Case T-208/84, *VICOM*/Computer-related invention, 1987 O.J. EPO 14, available at <http://www.epo.org/law-practice/case-law-appeals/pdf/t840208ep1.pdf> (last accessed July 15th, 2015).

that a graphical display resulting from a mathematical algorithm was held to be patentable. In the later *Pension Benefit Systems Partnership* case,⁴⁰ however, the EPO took a different approach—the so called “any hardware approach”—when it held that a computer loaded with a program always has a technical character. However, the *IBM* case⁴¹ later qualified this. It recognized that whenever a program is run on a computer, there is a technical effect. However, for an invention to be patentable, this alone is insufficient and a “further technical effect” that goes beyond the inherent technical interactions between hardware and software is needed.⁴² The EPO did not exactly explain what this further technical effect means, but provided some examples.⁴³

It is generally accepted that the criteria for granting software patents in Europe have not been consistently applied.⁴⁴ This inconsistency is exacerbated by the fact that neither the EPO case law nor the case law of the EPO Boards of Appeal is binding on the EPO member states. The proposed solutions include:

1. Referrals to the Enlarged Board of Appeal, which has, however, only confirmed the standing practice of the EPO, and

⁴⁰ Case T-931/95, *PBS Partnership/Controlling pension benefits system*, 2001 O.J. EPO 441, available at <http://www.epo.org/law-practice/case-law-appeals/pdf/t950931ep1.pdf> (last accessed July 15th, 2015).

⁴¹ Case T-1173/97, *IBM/Computer Program Product*, 1999 O.J. EPO 609, available at <http://www.epo.org/law-practice/case-law-appeals/pdf/t971173ex1.pdf> (last accessed July 15th, 2015).

⁴² Asher Wilk, *Patentability of Software*, SWSTE, Software Science, Technology and Engineering, IEEE International Conference on Software Science, Technology and Engineering, pp. 30-39, at p. 36, (2012).

⁴³ E.g. If the program acts on data representing a physical entity, such as, an image; or if it is saving memory space, increasing computational speed, and so on.

⁴⁴ See e.g. the UK case *Aerotel Ltd v. Telco Holding Ltd and others, and Neal William Macrossan's application*, [2006] EWCA Civ 1371.

2. The controversial Draft EU Directive on the Patentability of Computer-Implemented Inventions⁴⁵. The draft Directive proposed to allow for patentability of software as such (thus bringing the EU position closer to that of the U.S. in this regard) and was hoped to establish a common practice for the national courts and to establish the ECJ as the last instance for situations of doubt as to its interpretation. However, for political reasons, the draft Directive has never been adopted.

Therefore, unlike in the U.S., the EU law in this area continues in its fragmented state, with national patent systems coexisting with the European, and the national courts bearing the responsibility of final interpretation, following national case law. This carries the potential of defeating the very idea of harmonization.⁴⁶ The only exception is the situation where a European Patent is refused or revoked in opposition proceedings before the EPO, in which case it is the EPO that has the final say. The proposed Unitary Patent package,⁴⁷ however, seeks to create a supra-national patent system for the EU. While not without criticisms, the package is largely seen in a positive light and is keenly awaited.⁴⁸

1.3. Comparison and Analysis of the Two Systems

⁴⁵ Commission Proposal for a Directive of the European Parliament and of the Council on the Patentability of Computer-implemented Inventions, COM (2002) 92 final (June 25th, 2002).

⁴⁶ E.g. The UK law could invalidate a software patent granted by the EPO due to its stricter interpretation of the EPC.

⁴⁷ Commission Proposal for a Regulation of the European Parliament and of the Council Implementing Enhanced Cooperation in the Area of the Creation of Unitary Patent Protection, COM (2011) 215/3.

⁴⁸ For more information see e.g. Nicolas Janssens de Bisthoven, *Patent Trolls and Abusive Patent Litigation in Europe: What the Unitary Patent Package Can Learn From the American Experience?*, (TTLF Working Papers No. 19), Stanford-Vienna Transatlantic Technology Law Forum, Stanford: Stanford Law School, University of Vienna School of Law, (2013).

There is a general agreement that the software patent system, whether in the U.S. or the EU, is in a crisis.⁴⁹ Both systems suffer from uncertainty brought about by lack of clear legislative principles and conflicting case law; the excessively long time needed to process patent applications, the costs, amounts and the (low) quality of the patents granted. These problems naturally bring about antitrust/competition implications. The sections below analyze the problems and their antitrust/competition implications in more detail while comparing the situation in the U.S. and the EU.

1.4. Software Patents, Innovation and Antitrust/Competition

The particularities of software patents dealt with in detail below originate from the specific way software is patented and with the way innovation happens in software. The competitive effects of these particularities are analyzed as well.

1.4.1. Software Patents and Too Numerous and Too Broad

Firstly, it is safe to say that software patents are too numerous. This is even more so in the U.S.—while “only” approximately 50,000 computer patents were granted in the EU in 2007, the USPTO granted 500,000 in the same year.⁵⁰ And the number of software patent applications is ever increasing.⁵¹ Professors Dan

⁴⁹ E.g. Dan L. Burk & Mark A. Lemley, *The Patent Crisis and How the Courts Can Solve It*, (University of Chicago Press, Chicago, US, 2009).

⁵⁰ Daniel Closa et.al., *Patent Law for Computer Scientists: Steps to Protect Computer-implemented Inventions*, (1st ed., Springer, 2010).

⁵¹ Michael Noel & Mark Schankerman, *Strategic Patenting and Software Innovation*, *J. Ind. Econ.*, Vol.61(3), pp.481-520, (2013).

Burk and Mark Lemley refer to this phenomenon as the “patent flood”.⁵² The reasons for the patent flood are manifold and interconnected.

The restriction of software copyright and extension of software patentability would have been one of the factors that played a role in the patent flood both in the U.S. and the EU. However, the famously uncertain law on patentability of software is perhaps the main reason. Technology companies realized that, as long as their patent application is properly worded, they can patent almost anything. They now hold brainstorming sessions where they ask their staff to come up with ideas they can patent to enlarge their portfolio – and sometimes they do not even go through with developing it later on. They file for a patent for a concept because they can. And because under the broader U.S. law many more software inventions could potentially qualify for patent protection, many more try to patent their inventions in the U.S.

The shifting state of the law naturally also has an impact on the gatekeepers—the USPTO and the EPO. With the uncertain law as their guidelines, it is perhaps not so surprising that they are not doing a great job at keeping the gates. The sheer number of patent applications and the resulting insufficient time spent on the applications that go through their hands contribute to their staffs being overburdened. And because there are good reasons for having a fast patent system, it makes sense for the examiners to allow most of the patents—if one examiner rejects the patent, there are good chances of another one granting it the next time anyway. This perpetuates the vicious circle as more and more software patents are granted.

⁵² Dan L. Burk & Mark A. Lemley, *The Patent Crisis and How the Courts Can Solve It* (1st ed., University of Chicago Press, 2009).

Secondly, software patents are too broad. This again is a problem that is much worse in the U.S., for the reasons outlined above. The first reason is the broad, uncertain law. The second is the imperfect process of examination. It takes about 5 years to obtain a patent, but only 18 hours on average are spent examining the patents.⁵³ As Carl Shapiro points out, the USPTO's typically brief review process is allowing too many "questionable" patents to be issued that would likely be found invalid through a more thorough review.⁵⁴ And while this is also an issue in the EU, because the U.S. has more patent applications than the EU, there is more pressure on the USPTO. The total number of patent applications in 2013 was 609,052 in the U.S.⁵⁵ as opposed to 147,869 in the EU.⁵⁶ And even though the overall number of patent applications in the U.S. is more than four times higher than in the EU, the number of patent examiners in the U.S. is 8,051⁵⁷—only about twice higher than in the E.U. (where the number is 4,107).⁵⁸

Patents, in and of themselves, can hinder innovation, provide barriers to entry and promote monopolies.⁵⁹ That is why a balance needs to be struck between

⁵³ *Ibid* at p. 23.

⁵⁴ Carl Shapiro, *Patent System Reform: Economic Analysis and Critique*, 19 BERKELEY TECH. L.J. 1017, 1019 n.3 at 1018 - 1019, (2004).

⁵⁵ U.S. Patent and Trademark Office Patent Technology Monitoring Team, *U.S. Patent Statistics Chart Calendar Years 1963 – 2014*, available at http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm (last accessed July 12th, 2015).

⁵⁶ European Patent Office, *Annual Report 2013*, available at <http://www.epo.org/about-us/annual-reports-statistics/annual-report/2013/statistics-trends/patent-applications.html> (last accessed July 12th, 2015).

⁵⁷ U.S. Patent and Trademark Office, *Performance & Accountability Report, 2014*, at p. 169, available at <http://www.uspto.gov/about/stratplan/ar/USPTOFY2014PAR.pdf#page=146> (last accessed July 12th, 2015).

⁵⁸ The Five IP Offices, *IP5 Statistics Report 2013 Edition*, Chapter 2, p. 9, available at <http://www.fiveipoffices.org/statistics/statisticsreports/2013edition/chapter2.pdf> (last accessed July 7th, 2015).

⁵⁹ Robert W. Hahn, *Intellectual Property Rights in Frontier Industries: Software and Biotechnology*, at Chapter II (ed., AEI-Brookings Joint Center for Regulatory Studies, 2005) available at <http://ssrn.com/abstractid=574863> (last accessed July 15th, 2015).

strong intellectual property rights and the promotion of growth (innovation) through iterative improvement.⁶⁰ To assess software patents for antitrust/competition, we therefore need to ask whether such a balance has been struck in software.

Carl Shapiro observes the negative consequences of excessive patenting: “[w]hen patents are issued for inventions that are not truly novel, or are obvious, consumers are harmed, competition is restricted, and innovation is hindered—all contrary to the underlying purposes of the patent system.”⁶¹ The overly broad software patents that are often not truly novel or are obvious are therefore at high risk of being anticompetitive. Lawrence Lessig and many others hold the view that software patents do indeed harm competition by choking innovation through covering too much⁶² and as a result, space for further innovation is restricted. The balance is too skewed toward strong patent protection. Richard Stallman, the Free Software Foundation (FSF) president and founder, says this leads to software patents giving megacorporations a sort of dominion over the whole software field.⁶³

As Lemley points out, given these problems, it is perhaps “a wonder that companies make products in patent-intensive industries at all—but yet make products they do. Both my own experience and what limited empirical evidence there is suggest that companies do not seem much deterred from making products by the threat of all this patent litigation. Intel continues to make

⁶⁰ Josh Baskin, *Competitive Regulation of Mobile Software Systems: Promoting Innovation Through Reform of Antitrust and Patent Laws*, 64 *Hastings L.J.* 1727, at p. 1729 (2012 – 2013).

⁶¹ Carl Shapiro, *Patent System Reform: Economic Analysis and Critique*, 19 *Berkeley Tech. L. J.* 1017, 1019 n.3 at highlights (2004).

⁶² Lawrence Lessig, *Exclusive Rights to Stagnate*, *Fin. Times*, Feb. 20th, 2003.

⁶³ Bruce Byfield, *End Software Patents Project Comes out Swinging*, Linux archives, (2008) available at <http://archive09.linux.com/feature/128110> (last accessed July 12th, 2015).

microprocessors, Cisco routers, and Microsoft operating system software, even though they collectively face nearly 100 patent-infringement lawsuits at a time and receive hundreds more threats of suit each year.”⁶⁴

Martin Campbell-Kelly also argues that software patents are not very different from other technological patents and they offer similar benefits to the software industry as to other technological industries—e.g. the most economically efficient way of coordinating multiple R&D investments in major software technologies. He explains that the patent system has already adapted to many new technologies and it is just a matter of time for software, too.⁶⁵

It therefore seems that the competitive concerns of software patents are as hard to prove as their competitive efficiencies,⁶⁶ which puts the benefits of their very existence in question. However, the issue is perhaps not that software patents are anticompetitive in and of themselves—there are good reasons to have reasonable software patents in a properly working patent system. However, the reality is that software patents are too numerous and overbroad and that there are grave deficiencies in the patent systems. These are the factors that cannot be overlooked when assessing software patents for antitrust/competition and it is these factors that contribute to the competitive concerns.

1.4.2. Thickets

⁶⁴ Mark A. Lemley, *What Ifs and Other Alternative Intellectual Property and Cyberlaw Story: Ignoring Patents*, Mich. St. L. Rev. 19, p. 20 – 21, (2008).

⁶⁵ Martin Campbell-Kelly, *Not All Bad: An Historical Perspective on Software Patents*, 11 Mich. Telecomm. Tech. L. Rev. 191 (2005), available at <http://www.mtlr.org/voleleven/campbell-kelly.pdf> (last accessed July 15th, 2015).

⁶⁶ See e.g. Michele Boldrin & David K. Levine, *Against Intellectual Monopoly*, (1st ed., Cambridge University Press, 2008): Boldrin and Levine have identified seventeen economic studies that have examined, empirically, whether introducing or strengthening patent protection leads to greater innovation. These studies find weak or no evidence that strengthening patent regimes increases innovation.

Because there are so many patents in the software industry, the so called patent thickets are a common everyday reality. Patent thickets have been defined as "a dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology."⁶⁷ Christina Mulligan and Timothy Lee claim that it is virtually impossible to discover all the patents one may infringe in software—there is no easily searchable database for software ideas, and the discovery costs are prohibitively high.⁶⁸ However, this means that those who want to create new software need to have a lot of money—first, to go through the discovery process, second to pay licensing fees to all the patent owners and third for any litigation costs for patents they may be infringing. Obviously, this is going to have negative effects on innovation and is going to exclude a lot of potential competitors from entering the market. Thickets can also be easily exploited by those with dominant market positions.

One of the software industry “solutions” to this problem is obtaining a large patent portfolio to serve mainly as a means of keeping detente or for cross-licensing or pooling opportunities.⁶⁹ What this basically means is that the software industry participants “pile up a lot of patents because the other guy has a lot of patents” and this then allows them to engage in cross-licensing or

⁶⁷ Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting*, (2001) in Adam B. Jaffe, et al., *Innovation Policy and the Economy* (Vol. 1, Cambridge: MIT Press, 2001), pp. 119–150, at p. 120.

However, the expression may originally come from the *SCM Corp. v. Xerox Corp.* case, 599 F. 2d 32, 1979, where SCM's alleged that Xerox constructed a "patent thicket" to prevent competition.

⁶⁸ Christina Mulligan & Timothy B. Lee, *Scaling the Patent System*, NYU Annual Survey of American Law, Vol. 68, p. 289, (2012) available at <http://ssrn.com/abstract=2016968> (last accessed July 15th, 2015).

⁶⁹ Hr'g Tr., *Business Perspectives on Patents: Software and the Internet* (Morning Session) at 356 (Friedman), (Feb. 27, 2002), available at <http://www.ftc.gov/opp/intellect/020227trans.pdf> (last accessed July 15th, 2015).

pooling negotiations if threatened.⁷⁰ “Patent wars usually are only concluded when everyone agrees that it's mutually assured destruction. And to achieve mutually assured destruction, everyone has to have a whole bunch of nuclear weapons at their back.”⁷¹ This perpetuates another vicious circle of acquisition and consecutive thicket thickening.

As there are more software patents in the U.S., their software thickets are consequently denser.

1.4.3. Patent Trolls

A thicket is a home for trolls. While the term is very popular, there is no commonly accepted definition of trolls (or less pejoratively, NPEs).⁷² The term generally encompasses entities that engage in enforcement of their patent rights with the sole purpose of collect licensing fees, while not producing or practicing their patents.⁷³

Trolls focus more on high-tech than any other industry⁷⁴ and research claims that NPE lawsuits are especially concentrated in software and software-related patents including business methods.⁷⁵

⁷⁰ Hr'g Tr., *Business Perspectives on Patents: Hardware and Semiconductors* (Afternoon Session) at 662 (Hall), (Feb. 28th, 2002), available at <http://www.ftc.gov/opp/intellect/020228ftc.pdf> (last accessed July 15th, 2015).

⁷¹ APA - American Psychological Association, *In Digital War, Patents Are the Weapon of Choice*, Philadelphia: National Public Radio, 6th ed., (2012), available at <http://search.proquest.com/docview/1095690526?accountid=14026> (last accessed July 15th, 2015).

⁷² The first use of the term dates back to 1991, when Peter Detkin called an entity a “troll” after having been sued by them for libel when he initially called them “extortionists”.

⁷³ See e.g. Colleen V. Chien, *Frontiers in Empirical Patent Law Scholarship: Of Trolls, Davids, Goliaths, and Kings: Narratives and Evidence in the Litigation of High-Tech Patents*, 87 N.C.L. Rev. 1571, p. 1577-1578, (2009).

⁷⁴ Colleen V. Chien, *Frontiers in Empirical Patent Law Scholarship: of Trolls, Davids, Goliaths, and Kings: Narratives and Evidence in the Litigation of High-Tech Patents*, 87 N.C.L. Rev. 1571, (2009).

⁷⁵ James Bessen, Jennifer Ford & Michael J. Meurer, *The Private and Social Costs of*

The U.S. is a much better breeding ground for trolls—the thickets are denser, the litigation costs and damages for patent infringement are generally higher⁷⁶ and the jury trials more uncertain. Therefore, it makes much more sense for people to settle and pay royalties than go to court, as the financial risks are too high—sometimes it does not even matter whether one wins or loses.⁷⁷

While trolls are definitely viewed in a more negative than positive light, they have certain competitive benefits. Trolls recycle software patents that are not used by the owners. They then license these and make them available, fostering innovation. They can help destroy anticompetitive structures by licensing to multiple licensees; they thus help to open the market.⁷⁸ Also, as Nicolas Janssens points out, trolls can be used: one can subcontract patent protection to them. Trolls are especially efficient at this as they are insensitive to counter-claims.⁷⁹

On the other hand, trolls often engage in anticompetitive (or sham) litigation. Sham litigation is defined in *Professional Real Estate Investors, Inc. v. Columbia Pictures Industries, Inc.* case⁸⁰: “the lawsuit must be objectively baseless in the sense that no reasonable litigant could realistically expect success on the merits”⁸¹ and if that is the case, “the second element of the test: to show that the subjective purpose of the litigation is to invoke government

Patent Trolls, Boston University School of Law Working Paper No. 11-45, (2011), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1930272 (last accessed July 15th, 2015).

⁷⁶ 35 U.S.C. 284, granting “treble damages” for willful patent infringement.

⁷⁷ Nicolas Janssens de Bisthoven, *Patent Trolls and Abusive Patent Litigation in Europe: What the Unitary Patent Package Can Learn From the American Experience?*, (TTLF Working Papers No. 19), Stanford-Vienna Transatlantic Technology Law Forum, Stanford: Stanford Law School, University of Vienna School of Law, at p. 53 (2013).

⁷⁸ *Ibid* at p. 68.

⁷⁹ *Ibid* at p. 71.

⁸⁰ *Professional Real Estate Investors, Inc. v. Columbia Pictures Industries, Inc.* 508 U.S. 49, 60-61 (1993).

⁸¹ *Ibid* at p. 60.

processes in a scheme to interfere directly with the business relationships of a competitor.”⁸² If both elements are met, the use of such litigation is considered anticompetitive and can lead to severe penalties.⁸³ However, the two elements are not so easy to prove.

Using stock market event studies on patent lawsuit filings, it was found that troll lawsuits are associated with half a trillion dollars of lost wealth to defendants from 1990 through 2010. That implies reduced innovation incentives and a net loss of social welfare.⁸⁴ Moreover, trolls can have foreclosure effects—this is dealt with in more detail below in part 1.4.5.

At the end of the day, trolls can be useful (e.g. for IP valuing etc.) and what they do, while ethically controversial, is not *per se* illegal. The problem lies deeper—trolls take advantage of the deficiencies in the patent system—and that has competition implications.

1.4.4. Fast Innovation, Slow Patenting

Product cycles in software happen very quickly. However, on average, whether we are talking about the EU or the U.S., it takes about 5 years from the date of the filing of the application to issue a patent.⁸⁵ What that means in software is that the people who are doing the most innovation are seldom the people who

⁸² *Ibid* at p. 62.

⁸³ Josh Baskin, *Competitive Regulation of Mobile Software Systems: Promoting Innovation Through Reform of Antitrust and Patent Laws*, 64 *Hastings L.J.* 1727, at p. 1748 (2012 – 2013).

⁸⁴ Asher Wilk, *Patentability of Software*, SWSTE, Software Science, Technology and Engineering, IEEE International Conference on Software Science, Technology and Engineering, pp. 30-39, at p. 33, (2012) or James Bessen & Jennifer Ford & Michael J. Meurer, *The Private and Social Costs of Patent Trolls*, Boston University School of Law Working Paper No. 11-45, (2011), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1930272 (last accessed July 15th, 2015).

⁸⁵ Stuart J. H. Graham et al., *Patent Quality Control: A Comparison of U.S. Patent Reexaminations and European Patent Oppositions*, in Wesley Cohen & Merrill Stephen, *Patents in the Knowledge-Based Economy* (1st ed., the National Academies Press, 2003), p. 87.

own the software patents at the time they are doing the innovation. By the time they obtain the patent, their patented technology is going to be outdated.⁸⁶

This is a clear example of how the patent system fails in software to meet one of its central aims—the promotion of innovation.

1.4.5. *Individuals and Start-ups are the Drivers of Innovation*

First of all, it should be said that certain commentators believe that increased patent protection has contributed to the ability of independent inventors and smaller firms to compete.⁸⁷ However, when it comes to software, not everyone fully agrees. Software “patents can block entry, or raise entrants' costs in variety of ways, while at the same time they may stimulate entry by improving the bargaining position of entrants vis-à-vis incumbents, and supporting a ‘market for technology’ which enables new ventures to license their way into the market, or realize value through trade in their intangible assets.”⁸⁸ Moreover, individuals and small start-ups usually do not possess the resources to enforce their patents.⁸⁹

Secondly, in the thicket-ridden software industry, sooner or later one is bound to infringe several patents. Every software company that has a product that has become even moderately successful is at risk of being threatened by patent infringement suits. And that is why every software company that plans to

⁸⁶ Mark A. Lemley, William H. Neukom Professor of Law at Stanford University, Consultation at Stanford University, August 5th, 2014.

⁸⁷ John R. Allison, Abe Dunn & Ronald J. Mann, *Frontiers of Intellectual Property: Software Patents, Incumbents, and Entry*, 85 Tex. L. Rev. 1579, p. 1580 (2007).

⁸⁸ Iain M. Cockburn & Megan MacGarvie, *Patents, Thickets, and the Financing of Early-Stage Firms: Evidence from the Software Industry*, NBER Working Paper No. w13644 (2007), available at SSRN: <http://ssrn.com/abstract=1037168> (last accessed July 15th, 2015).

⁸⁹ Jeff A. Ronspies, *Comment: Does David Need a New Sling? Small Entities Face a Costly Barrier to Patent Protection*, 4 J. Marshall Rev. Intell. Prop. L. 184 (2004).

become even moderately successful should set money aside, because litigation will not be cheap. There are the costs for legal counsel, the costs of litigation (which are much higher in the U.S.), the uncertainty of jury rulings in the U.S., and possibly damages (treble in the U.S.). Hefty settlement figures are a bargain compared to that. Therefore it is unsurprising that “[e]vidence from surveys and practitioner accounts suggests that the time and expense of intellectual property litigation is a major consideration when deciding whether to pursue an innovation, especially among smaller firms.”⁹⁰ And as “garage inventors don't have liability”⁹¹ insurance, many are practically barred from entry.

And thirdly, if all that is not enough to discourage innovation, bar entry and retain the market power of the few, there are still anticompetitive litigation threats⁹² often followed by anticompetitive settlements⁹³ even in the absence of infringements. Individuals or small firms usually have just a few employees and possess at most limited legal expertise or resources to hire legal counsel. A legal notice and a threat of a lawsuit (the so called “cease and desist letters”—which are even more common than litigation not least because they are efficient in foreclosing potential competitors) will most likely mean that the firm will abandon its development activities. It does not matter that the lawsuit is sham;

⁹⁰ Adam B. Jaffe & Josh Lerner, *Innovation and Its Discontents: How Our Broken Patent System is Endangering Innovation and Progress, and What to Do about It*, (Princeton University Press, 2004).

⁹¹ Andrew Orlowski, *Microsoft aiming IBM-scale patent program at Linux?*, The Register, (2003) available at http://www.theregister.co.uk/2003/12/08/microsoft_aiming_ibmscale_patent_program/ (last accessed July 15th, 2015).

⁹² Kimberly A. Moore, *Populism and Patents*, 82 N.Y.U. L. Rev. 69, 90-91 (2007).

⁹³ Herbert J. Hovenkamp, Mark D. Janis & Mark A. Lemley, *Anticompetitive Settlement of Intellectual Property Disputes*, Minnesota L. Rev., Vol. 87, p. 1719 (2003).

the small firm will not have the possibility to assess it as such.⁹⁴ Those “lucky” ones who can afford to spend some money to pursue their activities will stand before a choice whether to litigate, sell out or pay a licensing fee.⁹⁵ For most individuals or small start-up companies, litigation is not an affordable option. Some do not get option three, so they are practically forced to abandon all further works and sell their company.⁹⁶ And the more financially equipped pay licensing fees.

On the other hand, Professors Mark Lemley and David McGowan add that, “while the network standardization effects in software markets generate results similar to those of a monopoly, the software industry is not, in fact, a true natural monopoly. While start-up costs for a software firm are greater than marginal costs, historically they have been low enough so that developers have been able to attract financing, suggesting that barriers to entry may not be so high as to deter entry and innovation.”⁹⁷ However, anticompetitive conduct of stronger players as outlined above can.

1.4.6. Nature of Inventive Process in the Software Industry

⁹⁴ Josh Baskin, *Competitive Regulation of Mobile Software Systems: Promoting Innovation Through Reform of Antitrust and Patent Laws*, 64 *Hastings L.J.* 1727, p. 1743 (2012 – 2013).

⁹⁵ Richard Raysman & Peter Brown, *Computer Law: Pre-Filing Issues in Enforcing Software/Business Method Patents*, N.Y. L.J., Sept. 10, at 3 col. 1 (2002).

⁹⁶ See e.g. the Siri saga, where Mr. Phillips was forced to sell the Siri technology to Mr. Ricci's company: Charles Duhigg & Steve Lohr, *The Patent, Used as a Sword*, NY Times, (2012) available at <http://www.nytimes.com/2012/10/08/technology/patent-wars-among-tech-giants-can-stifle-competition.html?pagewanted=all> (last accessed July 15th, 2015).

⁹⁷ Mark A. Lemley, *Antitrust and the Internet Standardization Problem*, 28 *Conn. L. Rev.* 1041, 1054 at 1056 (1996); and David McGowan, *Regulating Competition in the Information Age: Computer Software as an Essential Facility Under the Sherman Act*, 18 *Hastings Comm. & Ent. L.J.* 771, 846 (1996).

The software industry is characterized by a layered architecture—“one layer builds on the immediately preceding one and so on.”⁹⁸ Therefore the development is cumulative or iterative. Because of the layering, there is a lot of incompatibility across different systems, which leads to network effects (meaning the more people adopt the system, the more people adopt the system and the system becomes more valuable). This can then lead to the worsening of barriers to entry and the strengthening of the position of the dominant player, who then becomes a standard.⁹⁹

Also because of the iterative nature of development, “it may be difficult to evaluate novelty and inventive steps in a software invention. As a result, increasing low quality patents lead to higher probability in patent infringement and costs, and only cause inconvenience in inventing new technology.”¹⁰⁰ Some commentators have taken that a step further in arguing that, due to their cumulative and iterative nature, collaborative inventive process, and the high level of interconnectivity with other patentable subject matter, software and business methods are inherently incompatible with patent law.¹⁰¹

⁹⁸ Maureen A. O'Rourke, *Striking a Delicate Balance: Intellectual Property, Antitrust, Contract, and Standardization in the Computer Industry*, 12 Harv. J. Law & Tec 1, p. 4 (1998).

⁹⁹ *Ibid* at pp. 4, 5.

¹⁰⁰ Asher Wilk, *Patentability of Software*, SWSTE, Software Science, Technology and Engineering, IEEE International Conference on Software Science, Technology and Engineering, pp. 30-39, at p. 33, (2012).

¹⁰¹ *Ibid*.

2. Patent Pools and Their Regulation under the U.S. Antitrust and EU Competition Laws

2.1. Definitions of Patent Pools and Reasons for Their Creation

Patent pools are generally defined in both jurisdictions as a licensing practice whereby two or more parties assemble a package of technology which is licensed not only to contributors to the pool but also to third parties.¹⁰² Licensing out of the pool, as opposed to just within the pool, is what distinguishes patent pools from portfolio cross-licensing agreements, which are beyond the scope of this paper.

Patent pools may be linked to an industry standard and are often formed when multiple patented technologies are needed to produce a standardized product.¹⁰³

Structurally, technology pools vary from simple arrangements between a limited number of parties to elaborate organizational arrangements whereby the organization of the licensing of the pooled technologies is entrusted to a separate entity.¹⁰⁴

One of the main reasons for the creation of patent pools is the occurrence of patent thickets.¹⁰⁵ As explained above in section 1.2.1., patent thickets mean

¹⁰² New TT Guidelines (*Ibid at 2*), par. 244 or Antitrust-IP Guidelines: U.S. DoJ & F.T.C., Antitrust Guidelines for the Licensing of Intellectual Property, available at <http://www.justice.gov/atr/public/guidelines/0558.htm>, (last accessed July 15th, 2015), Didd, reprinted in 4 Trade Reg. Rep. (CCH) 13,132 (1995) § 5.5.

¹⁰³ James J. Kulbaski, *Comments on Patent Pools and Standards for Federal Trade Commission Hearings Regarding Competition & Intellectual Property*, (Apr. 17th, 2002 Hr'g R.) at 1.

¹⁰⁴ New TT Guidelines (*Ibid at 2*), par. 244.

¹⁰⁵ E.g. see – Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting*, (2001) in Adam B. Jaffe, et al., *Innovation Policy and the Economy* (Vol. 1, Cambridge: MIT Press, 2001), pp. 119–150; and Indrani Barpujari, *Facilitating Access or Monopoly: Patent Pools at the Interface of Patent and Competition Regimes*, 1 *Journal of Intellectual Property Rights*, Vol.15(5), pp.345-356 (2010).

that many independent patent holders have rights that cover a technology, a situation all too common in those industries that are characterized by a large number of overlapping rights, such as the software industry.¹⁰⁶ Consequently, if one wants to manufacture or sell a product, one needs to enter into negotiations and licensing agreements with all the relevant patent holders. Not only would this be a time- and effort- consuming exercise with high transaction costs, but it is not always possible to achieve a complete patent licences portfolio. This raises the risks of litigation resulting from an incomplete patent licences portfolio and leads to a situation where innovation is disincentified.¹⁰⁷ Patent pools are therefore meant to remedy this anticompetitive situation created by thickets by clearing the “blocking rights” and enabling the licensees to operate based on one license.

2.2. Efficiencies and Competitive Concerns of Patent Pools

Both the TT¹⁰⁸ and the Antitrust-IP Guidelines¹⁰⁹ recognize that patent pools can produce procompetitive effects—i.e. by reducing transaction costs through:

- Setting a limit on cumulative royalties (royalty stacking) to avoid double marginalization, or a “hold up” (a situation where firms make relationship-specific investments, after which they may face efforts by others to

¹⁰⁶ Also see U.S. Dep’t of Justice & Fed. Trade Comm’n, *Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition 1* (2007), p. 59, *available at* www.usdoj.gov/atr/public/hearings/ip/222655.pdf (last accessed July 15th, 2015).

¹⁰⁷ Anna Maria Baumgartner, *Antitrust Issues in Technology Transfer: A Comparative Legal Analysis of Patent Licenses in the EU and the U.S.*, (TTLF Working Papers No. 18), Stanford-Vienna Transatlantic Technology Law Forum, Stanford: Stanford Law School, University of Vienna School of Law, p. 304, (2013).

¹⁰⁸ TT Guidelines *ibid* at 2, par. 245.

¹⁰⁹ IP Guidelines *ibid* at 97, § 5.5.

recontract for more of the surplus¹¹⁰) and “hold out” (a situation when buyers need multiple complementary rights and sellers arrive, strategically, in a sequenced manner to gain advantages from being the last seller¹¹¹) problems.

- The creation of one-stop licensing of the technologies covered by the pool. Also, in industries where there is more than one pool, these can compete with each other.
- The provision of a contractual right to use the IP to the licensees, increasing transparency and predictability of IP costs. This also achieves certainty and what is commonly referred to as “patent peace”—“the design freedom needed to improve current products or design new products without fear of infringement”¹¹², therefore reducing costly and uncertain infringement litigation.
- Creating economies of scale.

In cases where licensees receive on-going services, patent pools can also play a beneficial role in the implementation of procompetitive standards.¹¹³ Patent pools may also integrate the complementary capabilities or technologies of the pool members.¹¹⁴

¹¹⁰ Oliver E. Williamson, *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting* (The Free Press, New York, 388 (1985)), p. 20-21.

¹¹¹ Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 Cal. L. Rev. 1293, 1298 n.9 (1996).

¹¹² Promoting Innovation and Competition *Ibid* at 101, p. 60.

¹¹³ TT Guidelines (*Ibid* at 2), par. 245.

¹¹⁴ IP Guidelines, (*Ibid* at 97), § 5.5.

Because access to the patented technology is easier, development of new technologies is facilitated.¹¹⁵ This is especially important given the problem of “blocking rights” or thickets mentioned above.¹¹⁶ Consequently, long-term investment in manufacturing and R&D (and therefore innovation) is encouraged.¹¹⁷

However, patent pools may also be restrictive of competition, which is perhaps not so surprising given they are basically agreements between competitors. The collective pricing of pooled patents, greater possibilities for collusion (e.g. through using the mechanism of the pool to exchange competitively sensitive information¹¹⁸) and generally larger number of market participants mean that patent pools need to be scrutinized for antitrust concerns.

Specifically, they can lead to creation of price fixing cartels¹¹⁹, market allocation, and reduction of innovation in the form of standard setting or foreclosure of alternative technologies or barriers to the entry of new and improved technologies.¹²⁰

Certain industries are said to be forced to rely on pools.¹²¹ As Steven Carlson argues, “in standard-dependent technologies, such as the MPEG protocol, there

¹¹⁵ Sharon K. Sandeen, *Intellectual Property Deskbook for the Business Lawyer: A Transactions-based Guide to Intellectual Property Law* (2nd ed., Intellectual Property Committee of the American Bar Association, 2009) at p. 270.

¹¹⁶ David A. Balto & Andrew M. Wolman, *Intellectual Property and Antitrust: General Principles*, 43 IDEA 395, p. 447 (2003).

¹¹⁷ David J. Teece, *Managing Intellectual Capital: Organizational, Strategic, and Policy Dimensions* (Oxford University Press, 2002), p. 139.

¹¹⁸ Promoting Innovation and Competition (*Ibid* at 101), at p. 67.

¹¹⁹ See e.g. *United States v. New Wrinkle, Inc.*, 342 U.S. 371 (1952).

¹²⁰ TT Guidelines (*Ibid* at 2) par. 246.

¹²¹ Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting*, (2001) in Adam B. Jaffe, et al., *Innovation Policy and the Economy* (Vol. 1, Cambridge: MIT Press, 2001), pp. 119–150, at p. 126 – 129.

is essentially no choice but to deal with the patent pool.”¹²² This can also amount to a violation of abuse of dominance provisions.

Where horizontal competitors pool their patents, competition for licensees is reduced—and even where a patent holder retains the right to license outside of the pool there may not be much incentive to do so.¹²³ Where the right to license out of the pool does not exist, this could discourage innovation.¹²⁴ Moreover, where the pool requires the members to grant licences to each other for present and future technologies (“grant-back”) at minimal cost or without an adequate reward, this may further disincentivise members to engage in research and development or cost-reducing process and product innovations and lead them to just freeride on the works of others.¹²⁵

Another anticompetitive concern relates to the pool’s ability to shield invalid patents through raising the costs and risks of an unsuccessful challenge¹²⁶ (like in the EU, where a challenge fails if only one patent in the pool is valid), or to shelter weak patents from validity challenges through non-challenge provisions¹²⁷ (which seems to be the situation in the U.S.). Licensees are thus required to pay for technology that should normally be free, royalties are higher and competition from substitute technologies outside the pool may be foreclosed and innovation thus hindered.¹²⁸

¹²² Steven C. Carlson, *Patent Pools and the Antitrust Dilemma*, 16 Yale J. On Reg, 359, 373-80 (1999).

¹²³ Adam Liberman et al., *International Licensing and Technology Transfer: Practice and the Law*, (Kluwer Law International, 2008), p. 8 – 9.

¹²⁴ Promoting Innovation and Competition (*Ibid* at 101), at p. 67.

¹²⁵ IP Guidelines (*Ibid* at 97), at § 5.5.

¹²⁶ TT Guidelines (*Ibid* at 2), at par. 272.

¹²⁷ Richard J. Gilbert, *Ties That Bind: Policies to Promote (Good) Patent Pools*, 77 Antitrust L.J. 1, 8 (2010).

¹²⁸ *Ibid*.

Therefore, in any regulation of patent pools, the right balance needs to be struck, and the sections below analyze whether this is so in the EU and the U.S.

2.3. Patent Pools and Antitrust in the U.S.

The first¹²⁹ and second¹³⁰ sections of the Sherman Antitrust Act (SA) prohibit combinations in restraint of trade and monopolization of trade respectively.

Historically, patent pools could not violate the Sherman Act due to freedom of contract, but later it was realized they can have anticompetitive effects.¹³¹

Generally, patent pools are viewed in a positive light in the U.S.¹³², but certain conditions must be met, as set out by the Antitrust Guidelines for the Licensing of Intellectual Property (IP Guidelines)¹³³ in § 5.5 under “cross-licensing and pooling arrangements”, which are quite brief compared to the EU Guidelines. Another source of useful guidance is the DoJ & FTC’s Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition—Chapter 3¹³⁴—which is slightly more detailed when it comes to pools.

¹²⁹ Sherman Antitrust Act, 15 U.S.C. § 1: “Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal. Every person who shall make any contract or engage in any combination or conspiracy hereby declared to be illegal shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$100,000,000 if a corporation, or, if any other person, \$1,000,000, or by imprisonment not exceeding 10 years, or by both said punishments, in the discretion of the court.”

¹³⁰ *Ibid* at § 2: “Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$100,000,000 if a corporation, or, if any other person, \$1,000,000, or by imprisonment not exceeding 10 years, or by both said punishments, in the discretion of the court.”

¹³¹ Adam Liberman et al., *International Licensing and Technology Transfer: Practice and the Law*, (Kluwer Law International, 2008), Ch. 6, p. 25.

¹³² Josh Lerner & Jean Tirole, *Public Policy toward Patent Pools*, in *Innovation Policy and the Economy*, (Vol. 8, University of Chicago Press, 2001), p. 157-186.

¹³³ Antitrust-IP Guidelines, *Ibid* at 97.

¹³⁴ Promoting Innovation and Competition *Ibid* at 101.

The Agencies have supplemented the Antitrust-IP Guidelines with several business review letters issued by the DoJ¹³⁵, and there is further guidance in the FTC's enforcement action in the *Summit-VISX* case¹³⁶.

Parties desiring a favorable business review can strive to eliminate or minimize the risk of anticompetitive effects by incorporating certain safeguards or mechanisms contained in the aforementioned letters—they can e.g. exclude substitute patents from the pool by ensuring that each patent is essential to the standard (they can engage an independent expert to that effect), limit licensor's access to the competitively sensitive information¹³⁷, retain the licensor's right to license their patents individually, limit the scope of grantback clauses, make the license agreement available to all interested licensees and provide a clear understanding of the contents of the license.¹³⁸

The economic and legal analysis of especially older legal cases is often inconsistent and less developed than the analysis employed by the Agencies.¹³⁹

The Agencies generally analyze patent pools under the rule of reason¹⁴⁰ and the overall analysis can be divided into the 3 steps:

- Relationship between Pooled IP Rights (2.3.1.),
- Overall Licensing Agreement and Individual Restraints (2.3.2), and

¹³⁵ E.g. Letter from Joel I. Klein, Acting Assistant Attorney Gen., U.S. Dep't of Justice, to Garrard R. Beeney, Esq. (June 26, 1997) on the MPEG-2 Pool, *available at* <http://www.usdoj.gov/atr/public/busreview/215742.pdf> (last accessed July 15th, 2015); Letter from Joel I. Klein, Assistant Attorney Gen., U.S. Dep't of Justice, to Garrard R. Beeney, Esq. (Dec. 16, 1998) on the DVD Pools, *available at* <http://www.usdoj.gov/atr/public/busreview/2121.pdf> (last accessed July 15th, 2015) and Letter from Joel I. Klein, Assistant Attorney Gen., U.S. Dep't of Justice, to Carey R. Ramos, Esq. (June 10, 1999), on the 3G "Patent Platform Licencing Program, *available at* <http://www.usdoj.gov/atr/public/busreview/2485.pdf> (last accessed July 15th, 2015).

¹³⁶ Decision and Order, *In re Summit Tech., Inc.*, 127 F.T.C. 208, 217 (1999) (No. 9286), *available at* <http://www.ftc.gov/os/decisions/docs/Volume127.pdf> (last accessed July 15th, 2015).

¹³⁷ Promoting Innovation and Competition *Ibid* at 101, at p. 85.

¹³⁸ *Ibid*, p. 72.

¹³⁹ *Ibid*, p. 66.

¹⁴⁰ *Ibid*, p. 85.

- Risk of Collusive Behavior and Safeguards (2.3.3.).

These are dealt with in more detail below.

2.3.1. Relationship between the Pooled IP Rights

In practice, two main distinctions are made in the assessment of the IP rights being pooled:

- between technological complements and technological substitutes and
- between essential and non-essential technologies.

Substitutes v. Complements

Substitutes cover alternative technologies and are considered non-blocking, therefore potentially competing with each other. Complements must usually be used together to produce a certain outcome.¹⁴¹

It is generally agreed that patent pools consisting of substitutable technologies are more likely to raise antitrust concerns, as opportunities are created to use the pool as a price fixing mechanism.¹⁴²

Pools consisting of complementary technologies, on the other hand, do not completely eliminate competitors, may create efficiencies¹⁴³ and tend to lower

¹⁴¹ Secretariat of the World Intellectual Property Organization (WIPO), *Patent Pools and Antitrust—A Comparative Analysis*, (March 2014), p. 4 available at http://www.wipo.int/export/sites/www/ip-competition/en/studies/patent_pools_report.pdf (last accessed July 15th, 2015).

¹⁴² E.g. Garrard R. Beeney, *Pro-competitive Aspects of Intellectual Property Pools: A Proposal for Safe Harbor Provisions*, (Apr. 17th, 2002 Hr'g R.) at 5, available at <http://www.ftc.gov/opp/intellect/020417garrardbeeney.pdf> (last accessed July 15th, 2015), and Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting*, (2001) in Adam B. Jaffe, et al., *Innovation Policy and the Economy* (Vol. 1, Cambridge: MIT Press, 2001), pp. 119–150, at p. 134.

¹⁴³ Adam Liberman et al., *International Licensing and Technology Transfer: Practice and the Law* (Kluwer International, 2008), p. 9.

prices for consumers¹⁴⁴, making the inclusion of complementary technologies in the pool desirable from the antitrust point of view.¹⁴⁵ However, some research suggests that complements can also have negative competitive effects such as discouragement of outside firms from investing in R&D if they increase the threat of litigation or the slowing of innovation if they redirect R&D by outside firms towards technologies that are not covered by pool patents (especially if those technologies are inferior).¹⁴⁶

The DoJ assumes the patents in the pool are valid. An invalid patent is considered not to be in a complementary relationship with other patents in the pool and to raise competitive concerns. The DoJ has included a process to eliminate such patents from the pooling proposals it approved—e.g. in the MPEG-2 or the Summit-VISX cases.¹⁴⁷

Essential v. Non-essential Patents

However, categorizing patents into one of the above categories is not always easy. Where a standard has been set, the approach so far has been to determine whether a patent is essential for the purposes of complying with a particular standard.¹⁴⁸ The definition of what is essential depends on the facts—

¹⁴⁴ Promoting Innovation and Competition *Ibid* 101, p. 66.

¹⁴⁵ Antitrust-IP Guidelines *Ibid* at 97, par. 2.0; Sharon K. Sandeen, *Intellectual Property Deskbook for the Business Lawyer: A Transactions-based Guide to Intellectual Property Law* (2nd ed., Intellectual Property Committee of the American Bar Association, 2009) at p. 270; Promoting Innovation and Competition *Ibid* at 101, at p. 66.

¹⁴⁶ See e.g. Thomas D. Jeitschko & Nanyun Zhang, *Adverse Effects of Patent Pooling on Product Development and Commercialization*, p. 2 (2013), available at www.justice.gov/atr/public/eag/283557.pdf (last accessed July 15th, 2015), or Ryan Lampe & Petra Moser, *Do Patent Pools Encourage Innovation? Evidence from the 19th-Century Sewing-Machine Industry*, (2009) available at <http://economics.stanford.edu/files/LampeOct15.pdf> (last accessed July 15th, 2015).

¹⁴⁷ Promoting Innovation and Competition *Ibid* at 101, p. 78.

¹⁴⁸ 6C DVD Business Review Letter – *Ibid* 129, at p. 10.

the DoJ has found reasonable (and has therefore approved) pooling proposals defining essential patents as those that are “practically (or economically) essential”¹⁴⁹, but also those that are “technically essential” to produce a product in accordance with a standard’s specifications¹⁵⁰. Essentiality then means that the patents in the pool are complements.¹⁵¹

The Agencies acknowledged, however, that in certain situations it may be reasonable to include substitute patents in a pool—cost-benefit and efficiencies analyses need to be made, and these are of course fact-dependent.¹⁵² The inclusion of substitutes is considered as one of many factors in their rule of reason analysis.¹⁵³

2.3.2. Overall Licensing Agreement and Individual Restraints

The second step in the Agencies’ analysis is to assess the overall licensing agreement and the individual restraints therein—in particular, whether the licences are exclusive, to what extent grantbacks are allowed, the structure and amount of royalties charged by the pool, and to what extent partial pool licences are allowed.

Exclusive Licensing

Exclusively licensing patents to a pool can reduce innovation, as a certain amount of freedom to combine technology is needed either to improve or

¹⁴⁹ 3C DVD Business Review Letter *Ibid* 129, at p. 3;

6C DVD Business Review Letter *Ibid* at 129, at p. 3.

¹⁵⁰ MPEG-2 Business Review Letter *Ibid* 129, at p. 9 - 10.

¹⁵¹ MPEG-2 Business Review Letter *Ibid* 129, at p. 5;

6C DVD Business Review Letter *Ibid* 129, at p. 3 - 5.

¹⁵² 3C DVD Business Review Letter *Ibid* 129, at p. 10;

6C DVD Business Review Letter *Ibid* 129, at p. 12 n.64.

¹⁵³ Promoting Innovation and Competition, *Ibid* 101, p. 78.

compete with the technology in the pool, and therefore allow production at a lower cost.¹⁵⁴ On the other hand, exclusive licences may be procompetitive if they are necessary to provide a significant incentive for the licensees to invest in complementary assets.¹⁵⁵ The competitiveness (or lack of thereof) will therefore depend on the facts of the case.

Licensors are generally free to choose exclusive or non-exclusive licensing, unless the pool members collectively possess market power in the relevant market¹⁵⁶ and are making the decision as a part of a concerted practice to hinder those outside the pool to compete with the pool in an effective way.¹⁵⁷ If that is the case, the Agencies conduct a rule of reason analysis. The Supreme Court also agrees that the rule of reason is the appropriate test, except in cases which would otherwise warrant *per se* treatment¹⁵⁸ (e.g. price fixing¹⁵⁹).

Grantbacks

The Antitrust-IP Guidelines define a grantback as “an arrangement under which a licensee agrees to extend to the licensor of intellectual property the right to use the licensee's improvements to the licensed technology”.¹⁶⁰

The Agencies recognize that grantbacks can promote competition by allowing licensors to use licensee's improvements to the licensed technology¹⁶¹, limiting

¹⁵⁴ David McGowan, *Enforcement Issues Regarding Pooling and Cross-Licensing* (Apr. 17, Hr'g R.) at 79, (2002), available at <http://www.ftc.gov/opp/intellect/020417davidmcgowan.pdf> (last accessed July 15th, 2015); Josh Lerner & Jean Tirole, *Efficient Patent Pools*, 94 Am. Econ. Rev. 691, 706 at 698-700 (2004).

¹⁵⁵ Promoting Innovation and Competition *Ibid* 101, at p. 80.

¹⁵⁶ Antitrust-IP Guidelines, *Ibid* 97, § 5.5.

¹⁵⁷ Promoting Innovation and Competition, *Ibid* 101, p.80.

¹⁵⁸ American Bar Association (ABA), ABA Section of Antitrust Law, *Intellectual Property and Antitrust Handbook 2007*, Chicago, Ill.: ABA Section of Antitrust Law, c2007, p. 237.

¹⁵⁹ See e.g. *United States v. Line Material Co.*, 333 U.S. 287, 314-315 (1948) or *United States v. New Wrinkle, Inc.*, 342 U.S. 371 (1952).

¹⁶⁰ Antitrust-IP Guidelines, *Ibid* 97, par. 5.6.

the ability of licensee's to refuse to license improvements and thus allowing production of patent-conforming products¹⁶², promoting innovation by rewarding first innovators for enabling follow-on innovation by others¹⁶³ and promoting subsequent licensing of innovation results.¹⁶⁴ At the same time, however, licensors may want to define a grantback's scope more broadly to include inventions which are related to the subject of the licensed patent or even completely unrelated inventions.¹⁶⁵ Broad grantbacks, especially those that strip the innovator of the right to license to others, can deter innovation by reducing the returns available to follow-on innovators.¹⁶⁶

Therefore, approval depends on the scope of the grantback—the Agencies are likely to approve limited grantbacks: non-exclusive grantback provisions that are limited to innovations that are within the scope of the existing essential patents to ensure that only complementary patents are added to the pool.¹⁶⁷

Royalties

The pools are normally free to fix royalties, and the Agencies generally do not assess the reasonableness of their structure or amount¹⁶⁸ but may nonetheless

¹⁶¹ Promoting Innovation and Competition, *Ibid* 101, p. 80.

¹⁶² Antitrust-IP Guidelines, *Ibid* 97, § 5.6; Herbert Hovenkamp, Mark D. Janis & Mark A. Lemley, *IP and Antitrust: An Analysis of Antitrust Principles Applied To Intellectual Property Law* (Aspen Law and Business, New York, 2002), at 25-2.

¹⁶³ Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, J.Econ. Persp., Vol. 5, Issue 1, 29 – 41, at 29, 31 (1991).

¹⁶⁴ Antitrust-IP Guidelines, *Ibid* 97, par. 5.6.

¹⁶⁵ Richard E. Donovan, *Antitrust Issues in Licensing*, in *Advanced Licensing Agreements For The New Economy* (by Ethan Horwitz & Steven M. Weinberg; Practising Law Institute, 2001) at 643, 660.

¹⁶⁶ Antitrust-IP Guidelines. *Ibid* 97, par. 5.6.

¹⁶⁷ MPEG-2 Business Review Letter *ibid* 129 at 12, 13; 3C DVD Business Review Letter *ibid* 129 at 8, 14; 6C DVD Business Review Letter *ibid* 129 at 8-9, 14-16; see also Antitrust-IP Guidelines *ibid* 97 at § 5.6.

¹⁶⁸ R. Hewitt Pate, Assistant Attorney Gen., U.S. Dep't of Justice, *Competition and Intellectual*

consider them as one of many factors when investigating alleged price coordination.¹⁶⁹ The Agencies believe (whether correctly or not) that when royalties are a small portion of the downstream price, it is unlikely that they are used to coordinate downstream prices.¹⁷⁰ However, even royalties that are a big proportion of the downstream price do not necessarily, in and of themselves, raise competitive concerns—other factors need to be considered.¹⁷¹

Partial-Pool Licenses

Generally, a refusal to license less than all of a pool's patents will not raise competitive concerns, provided that the licensors retain the ability to license their patents individually and the pool's design is otherwise procompetitive. However, this is not to say that the very idea of patent pools—the “one-stop-shop”—will not be thus defeated or that the combined costs of the individual licences will not be higher than those of the “blanket license”. A more efficient way would perhaps be to continuously review the portfolio to ensure all patents included are essential.¹⁷²

2.3.3. Risk of Collusive Behavior and Safeguards

This final step in the analysis focuses on whether pooling increases the risk of collusive behavior outside the pool and on the safeguards utilized to reduce this risk.

Property in the U.S.: Licensing Freedom and the Limits of Antitrust, Address Before the 2005 EU Competition Workshop 9 (June 3rd, 2005), available at <http://www.usdoj.gov/atr/public/speeches/209359.pdf> (last accessed July 15th, 2015).

¹⁶⁹ Promoting Innovation and Competition *ibid* 101, at p. 83.

¹⁷⁰ MPEG-2 Business Review Letter *ibid* 129 at 11; 3C DVD Business Review Letter *ibid* 129 at 13; 6C DVD Business Review Letter *ibid* 129 at 14.

¹⁷¹ Promoting Innovation and Competition *ibid* 101, at p. 83.

¹⁷² Promoting Innovation and Competition *ibid* 101, at p. 84.

Exchange of Sensitive Information

As mentioned above, the pool can serve as a mechanism that facilitates the exchange of competitively sensitive information, which could lead to, e.g., downstream price coordination¹⁷³ and reduction of innovation as a result of reduced investment in research and development because of fears that others in the pool will misappropriate sensitive information.¹⁷⁴ The existing pools that have been approved by the Agencies have used several mechanisms to avoid the abovementioned concerns—e.g. using an independent licensing administrator¹⁷⁵ or designing “walls” to limit access to each other’s sensitive information.¹⁷⁶

2.4. Patent Pools and Competition in the EU

The main competition provision in the EU can be found in Article 101 TFEU and prohibits cartels.¹⁷⁷

¹⁷³ U.S. DoJ & FTC, Commentary on the Horizontal Merger Guidelines 18-23 (2006), available at <http://www.usdoj.gov/atr/public/guidelines/215247.pdf> (last accessed July 15th, 2015).

¹⁷⁴ U.S. DoJ, Antitrust Division Policy Guide to Merger Remedies 23 (2004), reprinted in 4 Trade Reg. Rep. (CCH) ¶ 13,171, available at <http://www.usdoj.gov/atr/public/guidelines/205108.pdf> (last accessed July 15th, 2015).

¹⁷⁵ E.g. the MPEG pool – see the MPEG-2 Business Review Letter *ibid* 129 at 4, 11.

¹⁷⁶ E.g. both the DVD pools – see 3C DVD Business Review Letter *ibid* 129 at 7-8, 13; 6C DVD Business Review Letter *ibid* 129 at 9-10, 14.

¹⁷⁷ Consolidated Version of the Treaty on the Functioning of the European Union 2012 O.J. (C326) 47, Art. 101 (“TFEU”): The following shall be prohibited as incompatible with the internal market: all agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the internal market, and in particular those which:

- (a) directly or indirectly fix purchase or selling prices or any other trading conditions;
- (b) limit or control production, markets, technical development, or investment;
- (c) share markets or sources of supply;
- (d) apply dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage;

However, patent pools in the EU are covered by a new regime that came into effect on May 1st, 2014 and the main differences from the old regime are going to be highlighted below. Patent pools are not explicitly covered by the new TTBER¹⁷⁸, unlike the old TTBER.¹⁷⁹ It is the new TT Guidelines¹⁸⁰, a more voluminous guidance paper than the US Antitrust-IP Guidelines, that analyses patent pools under Article 101(1).

The new analysis that the Commission uses can also be divided into 3 main steps:

- Safe harbor (2.4.1.),
- Article 101 (1) TFEU assessment (2.4.2.), subdivided into 3 steps reminiscent of the U.S. approach above (2.3.1. – 2.3.3.), and
- Article 101 (3) assessment (2.4.3.).

These are dealt with in more detail below.

2.4.1. Safe Harbor

In contrast with the old TT Guidelines¹⁸¹ and the position in the U.S., the new TT Guidelines provide a comprehensive safe harbor for patent pools covering not only the creation of the pool, but also the licensing out, regardless of the market position, if all of the following conditions are met: open participation in the pool creation, inclusion only of essential technologies, inclusion of sufficient

(e) make the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.

¹⁷⁸ *Ibid* 2.

¹⁷⁹ Commission Regulation 772/2004 on the application of Article 81(3) of the Treaty to Categories of Technology Transfer Agreements, 2004 O.J. (L123) 11 (“Old TTBER”).

¹⁸⁰ *Ibid* 2.

¹⁸¹ Commission Notice, Guidelines on the application of Article 81 of the EC Treaty to Technology Transfer Agreements, 2004 O.J. (C 101) 2 (“Old TT Guidelines”).

safeguards against exchanges of sensitive information, non-exclusive licensing, licensing on RAND terms (i.e. reasonable and non-discriminatory terms—similar to FRAND: fair, reasonable and non-discriminatory terms in the EU), freedom of parties to challenge the validity and essentiality of the pooled technologies and freedom of parties to develop competing technology.¹⁸² If the conditions are not met, the pools need to be analyzed under Article 101 (1).

2.4.2. 101 (1) TFEU

Those pools that do not fulfill the criteria as set out in the TT Guidelines have to be assessed under Article 101 (1) TFEU. The approach of the Commission here is largely in line with the international trend, including in the U.S.

a) Relationship between Pooled IP Rights

Not unlike the U.S., the Commission recognizes that competitive risks and the efficiency enhancing potential of technology pools depend to a large extent on the relationship between the pooled technologies and their relationship with technologies outside the pool, and also distinguishes between:

- technological complements and technological substitutes and
- essential and non-essential technologies.¹⁸³

Complements¹⁸⁴, substitutes¹⁸⁵ and essentiality¹⁸⁶ are defined and treated similarly as in the U.S., but it is important to note that the Commission stresses

¹⁸² New TT Guidelines *ibid* 2 at par. 261.

¹⁸³ New TT Guidelines *ibid* 2 at par. 250.

¹⁸⁴ New TT Guidelines *ibid* 2 at par. 251.

¹⁸⁵ New TT Guidelines *ibid* 2 at par. 251.

that the definitions are not clear-cut or static and therefore patent pools require an on-going competition law review.¹⁸⁷ Also, the new definition of essentiality clarifies that essentiality covers not only essentiality in relation to producing a particular product, but also in relation to complying with a standard.¹⁸⁸

While the inclusion of substitutes in the pool is seen as potentially problematic in the U.S., they are not totally ruled out. The inclusion is subject to the rule of reason. However, in the EU, patent pools that cover substitute technologies receive a much stricter treatment—they are deemed a violation of Article 101 (1) as price fixing cartels and the conditions of Article 101 (3)¹⁸⁹ (which can be seen as the European counterpart of the U.S. rule of reason in some ways) will generally not be fulfilled.

b) Overall Licensing Agreement and Individual Restraints

Exclusive Licensing

The EU position in this regard seems to be stricter than in the U.S., with paragraph 270 of the new TT Guidelines specifying that licensors and licensees should be free to grant and obtain licences outside the pool (especially where the pool has a dominant position on the market¹⁹⁰), outlining the competitive

¹⁸⁶ New TT Guidelines *ibid* 2 at par. 252.

¹⁸⁷ WIPO Patent Pools Report *ibid* 135, at p. 16.

¹⁸⁸ New TT Guidelines *ibid* 2 at par. 252.

¹⁸⁹ Article 101 (3) TFEU (*ibid* 171): agreements or practices that would, in principle, violate Article 101 (1) which contribute to improving the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefit, and which do not (a) impose on the undertakings concerned restrictions which are not indispensable to the attainment of these objectives; and (b) afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products in question do not fall under the prohibition of Article 101 (1).

¹⁹⁰ New TT Guidelines *ibid* 2, par. 269.

concerns of the alternative. It also warns against the competitive risks of non-compete obligations in standards.

Grantbacks

Here, the EU mirrors the U.S. approach—it requires that grantback obligations should be non-exclusive and limited to developments that are non-essential.¹⁹¹

Royalties

Like in the U.S., the pool is free to fix royalties, subject to any commitment to license on FRAND terms.¹⁹²

Partial Pool Licenses

The TT Guidelines do not deal with partial pool licences.

c) Risk of Collusive Behavior and Safeguards

Sharing Sensitive Information

Here, the EU also follows the U.S. approach, recognizing the risks of collusion¹⁹³ and requiring certain safeguards.¹⁹⁴

2.4.3. Art. 101 (3)

However, there are pools that will neither fulfill the criteria for a safe harbor in the TT Guidelines, nor escape violating Article 101 (1)—in fact, given that the

¹⁹¹ New TT Guidelines *ibid* 2, at par. 271.

¹⁹² New TT Guidelines *ibid* 2, at par. 268.

¹⁹³ New TT Guidelines *ibid* 2, at par. 259 – 260; also Case C-7/95 P, *John Deere*, 1998 E.C.R. I-3111.

¹⁹⁴ E.g. an independent expert or licencing body – par. 259 of the new TT Guidelines *ibid* at 2.

safe harbor requirements are largely similar to the factors examined under Article 101 (1), these pools will likely not be rare. But they could still be “saved” under Article 101 (3) if their procompetitive efficiencies outweigh their negative effects on competition.¹⁹⁵ Therefore, a balancing exercise similar to the U.S. rule of reason needs to be undertaken before patent pools in the EU can be labeled as anticompetitive.

2.5. Comparison and Analysis of the Two Systems

While there used to be substantial convergence between the U.S. and the EU approaches in the past (perhaps because the EU sought to pattern their policies after the U.S.¹⁹⁶), after the 2014 changes it is arguably less so. There are the obvious differences we have always had—the longer EU codes, maybe best explained by the civil tradition influences in the EU; and the larger number of cases in the U.S., maybe to make up for the brevity of the codes. Then there is the single market imperative in the EU that does not figure as a consideration in the U.S. and affects (for better or worse)¹⁹⁷ the antitrust analysis in the EU.¹⁹⁸

What the 2014 change accomplished in the EU is that now patent pools can take the advantage of the safe harbor regime provided for by BERs. The regime is generally seen as providing the much needed certainty in the area—if the necessary conditions are met, all the other requirements fall away and the

¹⁹⁵ New TT Guidelines *ibid* 2, at par. 265.

¹⁹⁶ Hans Ullrich, *Patent Pools - Policy and Problems*, in *Research Handbook on Intellectual Property and Competition Law*, (Edward Elgar Publishing Limited, Cheltenham, 2008).

¹⁹⁷ Article 101 (1) has been applied even to intra-technology restrictions in patent licences where they divide the single market. However, as the patentee has an exclusive right, he should be able to impose whatever restrictions in such cases, and the grant of a licence can be seen as increasing competition!

¹⁹⁸ Richard Whish & David Bailey, *Competition Law*, p. 770, (Oxford, Oxford University Press, 2012).

patent pools are free to function. This is a much simpler and shorter process than in the U.S., where the pools have to wait for the business review. Once it gets to the review, however, the jurisdictions treat pools indeed very similarly, albeit in their own ways.

Therefore, as long as certain safeguards that are similar in both jurisdictions are adhered to, both systems generally agree that patent pools are procompetitive. However, does the procompetitiveness of patent pools hold for software patents, given their particularities?

3. Software Patent Pools and Antitrust/Competition

Given the findings of Section 1 and Section 2, this Section explores whether pooling alleviates or exacerbates the competitive concerns of software patents and whether, as a result, software patent pools are more or less anticompetitive than other patent pools.

3.1. Software Patents Are Too Numerous and Too Broad

The main question is whether the software industry would be a more or less competitive place with or without patent pools. Given that there are many overbroad patents (and the best solution would be not to have so many), having them collectively licensed through the pool may indeed be better than having them in the hands of one or several companies where any one of those companies can block anyone¹⁹⁹—for all the reasons outlined above.

On the other hand, if the pool violates many of the antitrust/competition provisions, it is not so certain. Therefore, the second question needs to be, what are the restrictions on the pool? For the pool to be a competitively better alternative to just having the patents out there in private hands, it needs to adhere to the abovementioned antitrust/competition laws. And this is the trouble with software patent pools.

Firstly, given that software patents are overbroad (i.e. sometimes covering even substitutable technologies), there is a real risk that the software patent pool will thus end up covering substitutable technologies. Moreover, patent pools, especially in the software area, have rapidly increased in size, from tens to

¹⁹⁹ Mark A. Lemley, William H. Neukom Professor of Law at Stanford University, Consultation at Stanford University, August 5th, 2014.

hundreds and even thousands of patents, making it far more difficult for independent experts to evaluate the quality and validity of patents and to ensure that they are complementary and not competing or substitute patents.²⁰⁰

Secondly, another concern is that strong patent protection combined with the pools gives technology companies that are a part of the pool significant leeway to refuse to deal. Moreover, given that these strong exclusionary rights last twenty years²⁰¹ (which is arguably too long for the fast-paced software industry), these patents could in effect foreclose all competition long enough to ruin any startup effort to innovate that field²⁰². This possible consequence is dealt with in more detail below in section 3.5.

Thirdly, it has been argued that pools can shield invalid patents from validity challenges.²⁰³ A recent study²⁰⁴ reviewed the MPEG-2 pool and concluded that at the beginning of 2014 only 40% of their patents were current. The number of valid patents in the MPEG-2 pool decreases every year.

That would mean that innovation in the field covered by these invalid patents from the pool would be prevented and the length of monopoly rights for these expired patents will be extended. It also resembles tying and bundling—forcing the producers to buy something they do not need in order to buy a product they actually want to buy.

²⁰⁰ David Balto, *Barriers to Competition on the Innovation Superhighway: How the Lack of Antitrust Scrutiny of Patent Pools Deters Competition*, at p. 2, available at: <http://dcantitrustlaw.com/patent%20pools%20-5%209%20pdf.pdf> (last accessed October 22nd, 2014).

²⁰¹ 35 U.S.C. § 154 (2012).

²⁰² Josh Baskin, *Competitive Regulation of Mobile Software Systems: Promoting Innovation Through Reform of Antitrust and Patent Laws*, 64 *Hastings L.J.* 1727, at p. 1739, (2012 – 2013).

²⁰³ See under Competitive Concerns of Patent Pools above in Section 2.2.

²⁰⁴ David Balto, *Barriers to Competition on the Innovation Superhighway: How the Lack of Antitrust Scrutiny of Patent Pools Deters Competition*, available at: <http://dcantitrustlaw.com/patent%20pools%20-5%209%20pdf.pdf> (last accessed October 22nd, 2014).

However, as Mark Lemley points out, it may be that it is not so much the pool that is shielding the patents, but rather the sheer number of patents in the pool. “If IBM comes to you with an offer of a license to their patent portfolio, it is usually not feasible to say no, I think your patents are invalid so I am not going to pay, because even though some may be invalid, loads more are valid.”²⁰⁵ However, that is also the case in the situation without pools. Therefore, unless we thought all patents in an area were invalid, we might need to pool to clear the way to the patents that are valid.²⁰⁶

However, there is harm in not invalidating these invalid patents. Misallocation of resources can occur, because the price for a license ought to be discounted to take account of the fact that some patents are invalid. The MPEG-2 pool’s decreasing trend in valid patents is not followed by the royalty rates. Producers are thus paying for something that should be free, and this naturally translates to the prices charged to the consumers. David Balto says that it is “[m]ore likely simply to yield to the pool’s demands for royalties, even if the patents might be weak or invalid, because of the uncertainty and expense of challenging the essentiality determination or litigation.”²⁰⁷ Also, “few, if any, potential licensees have the resources at their disposal to procure non-infringement opinions—or an independent expert determination of essentiality—for a pool containing thousands of patents. Indeed, it is far cheaper for a potential licensee to simply take a license to the pool, whether or not the patents in the pool are truly

²⁰⁵ Mark A. Lemley, William H. Neukom Professor of Law at Stanford University, Consultation at Stanford University, August 5th, 2014.

²⁰⁶ *Ibid.*

²⁰⁷ David Balto, *Barriers to Competition on the Innovation Superhighway: How the Lack of Antitrust Scrutiny of Patent Pools Deters Competition*, p. 4, available at: <http://dcantitrustlaw.com/patent%20pools%20-5%209%20pdf.pdf> (last accessed October 22nd, 2014).

essential, because the alternatives—spending considerable time and money to conduct an independent assessment or not do so and run the risk of infringement liability—are prohibitively expensive.”²⁰⁸

The question therefore arises: are the royalties paid by producers (and therefore, consumers) for access to the technology bundle containing valid as well as expired and invalid patents higher than the royalties they would have to pay in the absence of the pool (and therefore the thicket situation)? It is important to find an answer to this question, because the current pool situation, while certainly not the ideal solution, may still be an improvement from the non-pool situation as regards competitive efficiencies.

3.2. Thickets

The main idea behind patent pooling was to alleviate the problems created by patent thickets—this is dealt with in more detail in in section 2.1.—and in this particular case pools are clearly preferable to individual patents in the software industry.

On the other hand, in order to be an equal participant in the pool, one has to have a decent portfolio in order to reap all the benefits. And in order to acquire a decent portfolio, one has to acquire a considerable number of patents. It follows that the more patents there are in a field, the worse the thickets are. In this sense, software patent pools do not completely “solve” the thicket problem, because they (albeit indirectly) contribute to the acquisition frenzy that perpetuates the vicious circle.

²⁰⁸ Scott Sher, Jonathan R. Lutinski & Bradley T. Tennis, *The Role of Antitrust in Evaluating the Competitive Impact of Patent Pooling Arrangements*, 13 Sedona Conf. J. 111, at p. 130 (2012).

3.3. “Patent Trolls”

On one hand, it makes good sense to have patent trolls in the pools rather than outside—as a result of the pool’s cross licences, the pool participants can use the troll’s patents without the fear of litigation threats. This is very valuable in software.

On the other hand, this does not protect those who are not part of the pool in the same way. Also, patent pools work because the incentives of the patent owners are largely symmetric—where one patent owner cannot make a product without licences from another patent owner and vice versa, they decide to put their licences in a common pool. Trolls, however, do not have this incentive—they do not need the other licences, because they do not produce anything. So they can abuse the fact that their patents are needed and they do not need the other patents by asking for higher royalties. This may mean pools are less effective in software than other areas where owners of patents are also participants in market.²⁰⁹

3.4. Fast Innovation, Slow Patenting

Because software creators are rewarded with a patent so late, they are not equal participants in the pools—they are going to be buyers, rather than sharers in the pool, even though they have the technology. This could discourage innovation in the software industry.²¹⁰

²⁰⁹ Mark A. Lemley, William H. Neukom Professor of Law at Stanford University, Consultation at Stanford University, August 5th, 2014.

²¹⁰ *Ibid.*

3.5. Individuals and Start-ups Are the Drivers of Innovation

In software, there are thousands of patents, so no single firm holds them all and pools are created. Software patents are then used as “bargaining chips” and can create barriers to entry for small players: Large firms have large portfolios,²¹¹ and most are a part of some cross-licensing agreements or pools—so they have access to most of the technology. But what about the small firms? Are the costs of licensing prohibitively high?

The question therefore is whether pools are solving the royalty stacking and hold up problems and therefore giving start ups a lower price and better access to technology. One of the dangers is tying unnecessary patents to the licences—something that could hardly be avoided given how many and how broad software patents there are—which could raise royalty prices.

Another consideration is whether the pool alleviates or exacerbates the problem of anticompetitive litigation and settlements. Are individuals and start-ups more likely to get cease and desist letters from or be sued by several hundreds of different software patent owners or by the pool? What implications does that have? This data is unfortunately not available and would be hard (if not impossible) to collect.

3.6. Nature of Inventive Process in the Software Industry

Because of the iterative nature of development it could be harder to say which software patents are substitutes and which ones constitute essential

²¹¹ Because large firms patent more – see John R. Allison, Abe Dunn & Ronald J. Mann, *Frontiers of Intellectual Property: Software Patents, Incumbents, and Entry*, 85 Tex. L. Rev. 1579, p. 1597 (2007).

technology. The implications of including substitutes in the pool are dealt with above.

Conclusion

Drawing absolute conclusions is beyond the scope of this work. However, the research indicates the following. Software possesses particularities that originate from the way software is patented and the way innovation happens in the software industry. These particularities distinguish software from other types of technology and are competitively relevant.

While software patents were introduced with the objective of promoting innovation in the software industry, they are often very broad and too numerous, which can lead to barriers to entry, promotion of monopolies and restriction of innovation. Because of the numerous and overbroad patents, the software market is prone to patent thickets, which can have the effects of raising entry costs, excluding market entrants, and allowing for exploitation by the dominant players and thus choking innovation. Thickets also attract patent trolls which engage in anticompetitive litigation, which has foreclosure effects and reduces innovation.

As the inventive process in software is iterative, it is hard to prevent qualitatively weak patents; and due to standardization, barriers to entry can be worsened and the position of the dominant player can be strengthened. Moreover, the innovation in software happens very fast while the patenting process is very slow in comparison, which can again stifle innovation. Lastly, it is the individuals and start-ups that drive innovation in software—and there are risks that they could be barred from entry.

Patent pooling was devised primarily to deal with one of the competitive issues of patents—the thickets. However, even though the central aim is to remedy an

anticompetitive situation, the formation and functioning of patent pools can also give rise to anticompetitive concerns. As David Balto points out, recent years have shown that “structural, behavioral and market forces, especially in high-tech markets, are putting significant, perhaps unanticipated pressures on the competitive model of pooling and collective licensing.”²¹²

When the patents in the pool are software ones, the particularities of software can have an influence on the competitiveness of the patent pools in question. Because software patents are too numerous and too broad and because of the iterative nature of development in the software industry, there is the danger that substitutable technologies can be included in the pool, that the strong patent protection combined with the pooling mechanism can aid with refusals to deal with foreclosure effects and that the pool can shield invalid patents, raising royalties. Pools can indirectly cause thickets to thicken, and trolls in pools can raise royalties. Because of the late rewards for inventors, inventors are going to be sharers rather than buyers in the pool, which can negatively affect innovation. Individuals and start-ups can get barred from entry due to pooling. However, as with the competitive efficiencies and concerns of software patents, the competitive concerns and efficiencies of software patent pools are hard to prove. Moreover, a balancing exercise needs to be done to ascertain whether the competitively “imperfect” pools are still not a more procompetitive solution than the situation of their absence.

²¹² David Balto, *Barriers to Competition on the Innovation Superhighway: How the Lack of Antitrust Scrutiny of Patent Pools Deters Competition*, p. 25, available at <http://dcantitrustlaw.com/patent%20pools%20-5%209%20pdf.pdf> (last accessed October 22nd, 2014).

Given the findings, software patent pooling does not seem to be a perfectly procompetitive solution. It does not completely alleviate all the competitive concerns of software patents. But arguably, it was never really meant to do that. What is more worrying, however, is that apart from raising the general competitive concerns of patent pooling, specific concerns arise due to particularities of software. But for all we know, it could well be better than the alternative. A decisive competitive analysis of software patent pools versus the alternative would be needed. However, given the complexity of the matter, it would certainly be, at the very least, challenging—if not impossible.

It is unlikely that a panacea for the situation exists. However, any reform should start at the root of the problem—in this case, it should start with patent law. Many argue that software patents should be abolished all together.²¹³ Given that “the sensible basis for determining patentable subject matter is to determine whether innovation is unlikely in the absence of patents”²¹⁴ and “prior to 1981 it was not possible to patent software, and many important software innovations occurred”,²¹⁵ this would make sense. On the other hand, as Asher Wilk points out, it is unlikely this would happen as “thousands of software patents have already been issued and there are strong political and commercial

²¹³ See e.g. Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 Emory L.J. 1025, 1143, (1990) or Pamela Samuelson & Robert J. Glushko, *Comparing the Views of Lawyers and User Interface Designers on the Software Copyright “Look and Feel” Lawsuits*, 30 Jurimetrics J. 121, 135, (1989) or Russell Moy, *A Case Against Software Patents*, 17 Santa Clara Computer & High Tech. L.J. 67, 70-74, (2000).

²¹⁴ Josh Baskin, *Competitive Regulation of Mobile Software Systems: Promoting Innovation through Reform of Antitrust and Patent Laws*, 64 Hastings L.J. 1727, at pt. III. (2012 – 2013).

²¹⁵ Asher Wilk, *Patentability of Software*, SWSTE, Software Science, Technology and Engineering, IEEE International Conference on Software Science, Technology and Engineering, pp. 30-39, at p. 33, (2012); and Michele Boldrin & David K. Levine, *Against Intellectual Monopoly*, (Cambridge University Press, Cambridge, 2008).

forces interested in software patents.”²¹⁶ Moreover, there are innovations in software that are worthy of and appropriately protected by patents. Therefore, a better approach may be to properly define what software is patentable based on scientific and economic evidence, rather than politics. This would bring much needed certainty, narrow down the overbroad patents and reduce their number. However, the feasibility of this happening is also uncertain.

Another suggestion would be to reduce the patent term. According to Brian Love, trolls “are responsible for more than two-thirds of all suits and over eighty percent of all infringement claims litigated in the final three years of the patent term. These findings cast serious doubt on the utility of the last few years of the patent term”.²¹⁷ Allowing for reverse engineering of software patents,²¹⁸ permitting an independent invention defense²¹⁹ and strengthening patent misuse defense²²⁰ are also reform suggestions worth exploring.

The reform, however, would not be complete without reforming antitrust/competition law as well. Some proposed solutions include reforms of anticompetitive litigation to solve the issue of trolls,²²¹ compulsory patent

²¹⁶ *Ibid*, at p. 38.

²¹⁷ Brian J. Love, *An Empirical Study of Patent Litigation Timing: Could a Patent Term Reduction Decimate Trolls Without Harming Innovators?*, 161 U. Pa. L. Rev. 1309 (2013). In fact, their findings are so dramatic, that “all claims asserting the average product-company patent are resolved before the average NPE patent is asserted for the first time”.

²¹⁸ See e.g. Josh Baskin, *Competitive Regulation of Mobile Software Systems: Promoting Innovation through Reform of Antitrust and Patent Laws*, 64 Hastings L.J. 1727, at p. 1751 – 1753 (2012 – 2013); or Duncan M. Davidson, *Common Law, Uncommon Software*, 47 U. Pitt. L. Rev. 1037, 1105 (1986).

²¹⁹ See e.g. Samson Vermont, *Independent Invention As A Defense To Patent Infringement*, 105 Mich. L. Rev. 475 (2006); or Mark A. Lemley, *Correspondence: Should Patent Infringement Require Proof Of Copying?*, 105 Mich. L. Rev. 1525 (2007).

²²⁰ Daryl Lim, *Patent Misuse and Antitrust Law: Empirical, Doctrinal and Policy Perspectives*, (Edward Elgar, Northampton, MA, USA, 2013).

²²¹ See e.g. Josh Baskin, *Competitive Regulation of Mobile Software Systems: Promoting Innovation through Reform of Antitrust and Patent Laws*, 64 Hastings L.J. 1727 (2012 – 2013).

licensing laws to avoid refusals to license²²² and binding and strictly enforced requirements to license on FRAND terms²²³.

The above reforms concentrate on improving the overall environment in which software patent pools exist. However, the scrutiny of software patent pools as such for antitrust/competition should also be increased and be more focused as well to take into account the particularities of software mentioned above. Tightly connected to that matter is the issue of antitrust/competition enforcement.²²⁴ Given the competitive concerns of software patent pools outlined above, the courts' permissiveness when labeling essential patents and the fact that it is the pool itself that hires the expert evaluator, proper enforcement is vitally needed. However, in over 15 years, neither federal antitrust enforcer has challenged a patent pool.²²⁵

Whether the other reforms materialise is uncertain, but to ensure software patent pools are indeed solving more competitive problems than they are causing, proper scrutiny and enforcement are a must—and there is plenty of scope for improvement.

²²² See e.g. Carol M. Nielsen & Michael R. Samardzija, *Compulsory Patent Licensing: Is It a Viable Solution in the United States?*, 13 Mich. Telecomm. Tech. L. Rev. 509, p. 527, (2007) available at <http://www.mttl.org/volthirteen/nielsen&samardzija.pdf> (last accessed July 15th, 2015).

²²³ E.g. Mark A. Lemley, William H. Neukom Professor of Law at Stanford University, Consultation at Stanford University, August 5th, 2014.

²²⁴ Kenneth Flamm, *A Tale of Two Standards: Patent Pools and Innovation in the Optical Disk Drive Industry*, Working Paper 18931, National Bureau of Economic Research (2013) available at <http://www.nber.org/papers/w18931> (last accessed July 15th, 2015).

²²⁵ David Balto, *Barriers to Competition on the Innovation Superhighway: How the Lack of Antitrust Scrutiny of Patent Pools Deters Competition*, available at <http://dcantitrustlaw.com/patent%20pools%20-5%209%20pdf.pdf> (last accessed October 22nd, 2014).