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New Challenges in the Intersection of Intellectual Property Rights with Competition Law - A View from Europe and the United States

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April 2013

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I. INTRODUCTION

In recent years, many countries have engaged in serious reexaminations of the legal regimes they use to support innovation. In part, the establishment of the World Trade Organization and its adoption of the Trade Related Aspects of Intellectual Property Law (TRIPS) Agreement has necessitated revision of most national intellectual property laws.¹ In part, new economic theories have driven a reassessment, particularly at the interface between competition law and intellectual property law. Mostly, however, the importance of knowledge products in the modern global economy has focused attention on finding optimal methods to promote domestic intellectual production. This paper describes key trends, with special attention to the EU and the United States, and with a focus on patent rights.

Developments in the United States demonstrate the need for reexamination. In that country, encouraging technological growth has been a longstanding interest. Thomas Jefferson was an inventor and took a personal interest in the patent system.² Many scientific institutions were established in the first century of the Nation's existence—the Smithsonian Institute and the American Association for the Advancement of Science in 1850; the National Academy of Sciences and the Department of Agriculture, in 1862. In 1862 and 1890, the Morrill Acts gave birth to the land-grant college system, which concentrated on innovation in agriculture, science, and engineering.³ Indeed, because technology—advances in aviation, radar, encryption, medicine, and nuclear energy—was considered so important to winning World War II, President Roosevelt asked Vannevar Bush, his science advisor, to create a technology plan for the post-war period.⁴

The strategy Bush developed was centered on a linear theory: he thought innovation began “upstream”, with fundamental scientific insights, and moved “downstream” through the discovery of technical applications of these insights, the development of commercial embodiments and manufacturing techniques, followed by arrangements for distribution, servicing, and sales. In Bush's view, upstream research—basic science—was too far removed from application to be an attractive target for commercial investment. At the same time, however, he saw this work as the wellspring from which multiple technological prospects flow. To assure continuing support for basic science, he recommended—and the U.S. Government pursued—a mixed program of intramural research within Government laboratories and

¹ Agreement on Trade Related Aspects of Intellectual Property Rights, 15 Apr. 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Legal Instruments—Results of the Uruguay Round vol. 31, 33 I.L.M. 81 (1994) [hereinafter TRIPS Agreement].

² *Graham v John Deere Co* 383 US 1 (1966).

³ Diana Rhoten and Woody W Powell, ‘Public Research Universities: From Land Grant to Federal Grant to Patent Grant Institutions’ in Diana Rhoten and Craig J Calhoun (eds), *Knowledge Matters* (Columbia University Press 2010) 315.

⁴ Vannevar Bush, ‘Science- The Endless Frontier: A Report to the President On A Program for Postwar Scientific Research’ (United States Government Printing Office, 1945).

Government funding of extramural research in universities and other nonprofit organizations.⁵ The expectation was that robust competition would function as an “engine,” driving industry to adapt the advances, find applications, create new businesses and jobs, enhance productivity, and improve social welfare.⁶ Intellectual property and competition (antitrust) laws would facilitate the process. Intellectual property rights would protect inventors and investors who sunk effort and funds into development from free riders—those who would otherwise copy the advance and low cost, and undercut the price charged by the original inventor. (There are other justifications for intellectual property rights, but US law has largely been based on this utilitarian approach).⁷ Competition law would supplement intellectual property protection and would also counterbalance it by safeguarding the public from right holders who might otherwise prevent follow-on innovation or otherwise impose excessive costs.

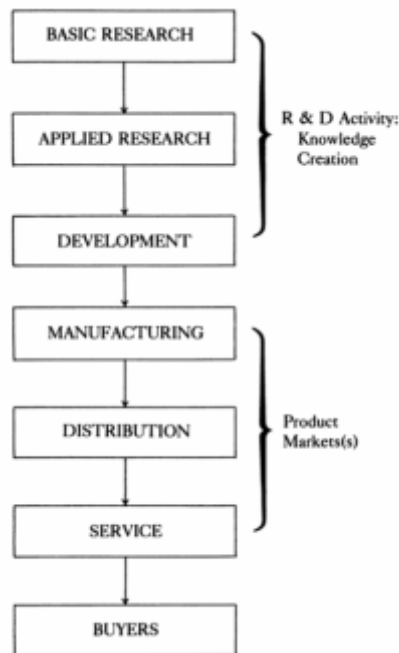
Figure 1⁸

⁵ See National Research Council of the National Academies, Committee on Management of University Intellectual Property, *Lessons from a Generation of Experience, Research and Dialogue, ‘Managing University Intellectual Property in the Public Interest’* (The National Academy Press 2010) 69-70.

⁶ Joseph A Schumpeter, *The Theory of Economic Development* (London, Transaction Pub 2005, first published by Harvard University Press in 1934) and *Capitalism, Socialism and Democracy* (1942, published by Harper & Bros. in 1950).

⁷ See, e.g., Brad Sherman and Lionel Bently, *The Making of Modern Intellectual Property Law* (Cambridge University Press 1999) 14-24 (considering the shift from occupancy to mental labour as the source of property right provided the first form of justification for instituting property rights on ideas); Kenneth W Dam, ‘The Economic Underpinnings of Patent Law’ (1994) 23 *Journal of Legal Studies* 247; F M Scherer, ‘The Innovation Lottery’ in Rochelle C Dreyfuss, Harry First and Diane L Zimmerman (eds), *Expanding the Boundaries of Intellectual Property* (Oxford University Press 2001) 3; Edmund W Kitch, ‘The Nature and Function of the Patent System’ (1977) 20 *Journal of Law and Economics* 265 (proposing a “mining claim” or “prospecting theory, more fully described below).

⁸ Jansuz A Ordovery, ‘Economic Foundations and Considerations in Protecting Industrial and Intellectual Property’ (1984) 53(3) *Antitrust Law Journal* 503, 515.



To a large extent, this construct still characterizes the innovation policy landscape. As Part II of this paper recounts, patents are available in all fields of technology. However, patentable subject matter is defined in a manner that withholds protection for advances, such as the discovery of principles of science (for example, $E = mc^2$, the fundamental relationship between energy and mass), that are so generative, applications are best developed competitively. Furthermore, rights are cabined by exceptions and limitations (such as research exceptions) that facilitate further research and competitive development downstream. And as Part III shows, there is a set of rules at the intersection between intellectual property law and competition law that are crafted to protect follow-on innovation and a competitive market place for technological products (and in some cases, for technological opportunities).

That said, it has become clear that the Bush model and the laws that flowed from it do not capture many important aspects of the innovation process. First, modern economists have questioned the linearity of innovation. Fundamental insights are not the exclusive domain of scientists. In fact, downstream players can have a significant role in identifying new prospects and finding commercial opportunities for their use. Conversely, upstream inventors are sometimes in the best position to guide the further development of fundamental insights.⁹ Thus, for example, in 1982, the United States enacted the Bayh-Dole Act in order to permit universities to own patent rights in the fruits of government-supported work.¹⁰ The enactment was largely intended to bring scientists and industry into closer alliance and facilitate greater interchange of ideas and information.¹¹ Similarly, the emerging shift from vertical integration to value chain

⁹ See, e.g., Fiona Murray and Siobhan O'Mahony, 'Exploring the Foundations of Cumulative Innovation: Implications for Organization Science' (2007) 18 Organization Science 1006.

¹⁰ 35 U.S.C. §§ 200-212.

¹¹ Peter Lee, 'Transcending the Tacit Dimension: Patents, Relationships, and Organizational Integration in Technology Transfer' (2004) 100 California Law Review 1503.

licensing recognizes that every participant in the innovation process brings its own expertise to bear in taking ideas and turning them into marketplace products.¹² Since intellectual property licenses serve to allocate rewards along the development path, rights holders require a high degree of flexibility in the manner in which they arrange their business dealings.¹³ As Parts III and IV demonstrate, both intellectual property and competition law must be reconsidered in light of these developments.

Second, it has become evident that the pattern of technological advance is not the same in all fields. As Richard Nelson and Robert Merges have noted, ‘at least four different generic models are needed. The first describes discrete invention. A second concerns “cumulative” technologies. Chemical technologies have special characteristics of their own. Finally, there are “science-based” technologies where technical advance is driven by developments in science outside the industry’.¹⁴ A “one size fits all” intellectual property system is therefore not appropriate. Specifically, because intellectual property law was first developed during the Industrial Revolution, it is largely based on stand-alone (discrete) mechanical inventions. Thus, it has few doctrines that permit one generation of innovators to “stand on the shoulders” of those who went before.¹⁵ As a result, it must be considerably revamped to deal with the incremental (cumulative) approach that characterizes much of the innovation occurring in the Knowledge Revolution. The emergence of the software and semiconductor sectors furnishes two examples. Similarly, change is necessary to make the law resonate better with a science-based sector such as biotechnology. Part II discusses the many opportunities (or as Dan Burk and Mark Lemley would put it, “levers”) that can be used to tailor patent law to deal with these realities.¹⁶

Third, classic intellectual property and innovation laws were developed with a single jurisdiction in mind. As borders have become more permeable, capital, firms, and expertise migrate to jurisdictions with the most favorable conditions.¹⁷ Indeed, the promulgation of the TRIPS Agreement within the World Trade Organization is testament to this change. Part II describes ways in which countries have started to alter patent law to reflect the global nature of the innovation enterprise and Part IV discusses changes necessitated by the global marketplace for innovative products. The increasing number of jurisdictions worldwide having adopted and enforcing competition law statutes may nevertheless complicate the operation of these global IP rules, in view of the divergent positions various jurisdictions take on the intersection of

¹² Sean M O’Connor, ‘IP Transactions as Facilitators of the Globalized Innovation Economy’ in Rochelle C. Dreyfuss, Diane L Zimmerman and Harry First (eds), *Working Within the Boundaries of Intellectual Property-Innovation Policy for the Knowledge Society* (Oxford University Press 2010) 203.

¹³ David J Teece, Gary Pisano and Amy Shuen, ‘Dynamic Capabilities and Strategic Management’ (1997) 18 *Strategic Management Journal* 509, 516; David J Teece, ‘Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy’ (1986) 15 *Research Policy* 285.

¹⁴ Robert P Merges and Richard R Nelson, ‘On the Complex Economics of Patent Scope’ (1990) 90 *Columbia Law Review* 839, 880.

¹⁵ See, e.g., Suzanne Scotchmer, ‘Standing on the Shoulders of Giants: Protecting Cumulative Research and the Patent Law’ (1991) 5 *Journal of Economic Perspectives* 29. The phrase, “standing of the shoulders of giants,” derives from a letter Isaac Newton wrote to Robert Hooke, see Robert Andrews et al (eds), *The Columbia World of Quotations No. 41418* (Columbia University Press 1996).

¹⁶ Dan L Burk and Mark A Lemley, *The Patent Crisis and How Courts Can Solve it* (University of Chicago Press 2009).

¹⁷ Pamela Samuelson, ‘Intellectual Property Arbitrage: How Foreign Rules Can Affect Domestic Protections’ (2004) 71 *University of Chicago Law Review* 223.

competition law with IP rights and the absence of a global competition law framework, equivalent to the TRIPS agreement. Part III provides an illustration by focusing on a comparative analysis of US antitrust law and EU competition law applying to IP related practices. These legal developments are not, however, the only ways in which countries adjust to the multinational environment. To the contrary, a variety of mechanisms—mostly outside of intellectual property and competition law and thus outside the scope of this paper—have developed to stem the “brain drain” and even to repatriate knowledge workers who have emigrated for education or job opportunities.

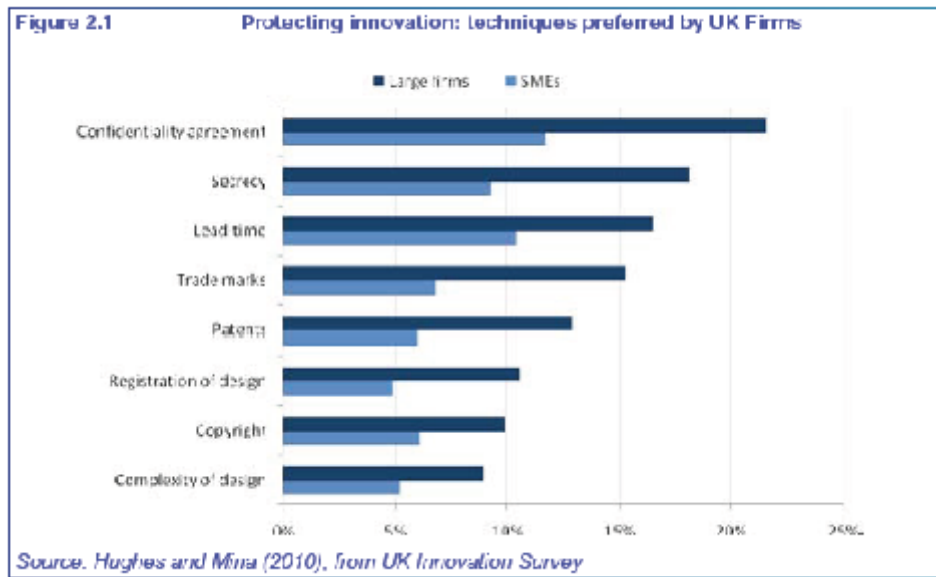
Fourth, it has become evident that intellectual property laws are not the sole determinants of innovation. Firms appropriate the benefits of inventiveness in a variety of ways; for many firms, patent law is low on the list of strategies. As a survey by Alan Hughes and Andrea Mina conducted in the United Kingdom shows, depending on the size of the firm, lead time advantage, along with methods to perpetuate that advantage through secrecy, is first on the list for many firms. Thus, laws protecting trade secrets and enforcing confidentiality agreements can be as important as more formal intellectual property law.¹⁸ Indeed, Edwin Mansfield’s work suggests that the pharmaceutical sector is alone in relying principally on patent law to capture returns from innovation.¹⁹ Once again, a “one-size-fits-all” system makes little sense and Part II illustrates how patent law can be manipulated to deal with differences that arise from the technical field in which innovation is taking place, changes that occur as an industry matures, and other variables.

Figure 2²⁰

¹⁸ See also Edwin Mansfield, ‘R&D and Innovation: Some Empirical Findings’ in Zvi Griliches (ed), *R&D, Patents and Productivity*, National Bureau of National Research (The University of Chicago Press 1984) 127.

¹⁹ Edwin Mansfield, ‘Patents and Innovation: An Empirical Study’ (1986) 32 *Management Science* 173. See generally Andrés López, ‘Innovation and Appropriability, Empirical Evidence and Research Agenda’ in *The Economics of Innovation* (WIPO 2009), available at <http://www.wipo.int/ip-development/en/economics/pdf/wo_1012_e_ch_1.pdf> accessed 28 April 2013.

²⁰ Ian Hargreaves, ‘Digital Opportunity – A Review of Intellectual Property and Growth’ (May 2011), available at <<http://www.ipo.gov.uk/ipreview-finalreport.pdf>> at p. 17, accessed 28 April 2013.



Closely related to this observation is another one: it is increasingly recognized that a significant amount of innovation occurs in the absence of *any* mechanism to directly appropriate returns. So-called “open innovation” is spurred by a variety factors, including curiosity; pleasure; the expectation of reputational benefits, professional advancement, and prizes; and to obtain reciprocal benefits.²¹ These systems are often supported by ancillary profit-based interests. For example, IBM supports Linux, a free software platform, so that it has a base that will always be freely available to run its proprietary programs; user groups will develop new products (such as research tools) through free exchange within their own communities, but once these products move to the commercial stage, intellectual property rights are needed to promote further developments. Thus far, no intellectual property or competition law regime has made adjustments that recognize the importance of open innovation. Accordingly, the sorts of accommodations necessary are mentioned only briefly in the sections that follow.²²

This discussion highlights not only the importance of intellectual property and competition law, but also the need for a governance system that stays abreast of technological, economic, and social developments, and which is steeped in the economic literature. Part V examines institutional design and highlights the regulatory choices that are available to optimize innovation law and policy.

²¹ See, e.g., Eric von Hippel, *Democratizing Innovation* (MIT Press 2005); Henry W Chesbrough, *Open Innovation: The New Imperative for Creating and Profiting from Technology* (Harvard Business School Press 2003); Katherine J Strandburg, ‘Curiosity-Driven Research and University Technology Transfer’ in Gary D Libecap (ed) (2005) 16 *Advances in the Study of Entrepreneurship, Innovation and Economic Growth* 97; Fiona Murray, et al, ‘Of Mice and Academics: Examining the Effect of Openness on Innovation’ (March 2009), NBER Working Paper Series, Vol. w14819, 2009, available at <<http://ssrn.com/abstract=1369055>> accessed 28 April 2013.

²² But see Rochelle C Dreyfuss, ‘Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm’ (2010) 31 *Cardozo Law Review* 1437.

II. THE INTERACTION BETWEEN HORIZONTAL IP RULES AND SECTOR SPECIFIC IP REGIMES

Any consideration of intellectual property law in the trade context must begin with the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), which sets minimum levels of protection that all members of the World Trade Organization (WTO) must meet. For the purpose of considering technological innovation, the patent provisions are the most significant. Under TRIPS, all members must provide patents for all “products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application” (in US parlance, they must be new, nonobvious and useful); no member can discriminate by field of technology, place of invention, or whether products are produced locally or imported (art. 27.1). The patent must give holders of product patents the right to prevent others from making, using, offering for sale, selling, or importing the identical invention; holders of process patents must enjoy the right to prevent others from using the process or using, offering for sale, selling or importing product made directly from the process (art. 28). The patent must include a disclosure of the invention (art. 29). And the right must endure for 20 years from the date the patent application is filed (art. 33).

Within these limits, there is considerable room for national variation. The TRIPS Agreement permits WTO members to exclude from patentability inventions whose exploitation would endanger the public order or involve immorality; specifically, members can exclude therapeutic, diagnostic and surgical methods, plants, and animals (for plants, however, *sui generis* protection is necessary) (art. 27.2 & 3). In addition, members may award compulsory licenses under certain, highly specified, circumstances (art. 31). Finally, there is a general exceptions test that allows members to enact “limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties” (art. 30). Art. 30 was strictly construed by a WTO Dispute Settlement Panel in the *Canada-Pharmaceuticals* case: the test is cumulative and the incursion on exclusivity must be extremely narrow. The Panel also required that any limitation meet the technological neutrality requirement of art. 27.1.²³ However, after the *Canada* dispute was resolved, a Ministerial Declaration (the Doha Declaration) emphasized that the Agreement (and presumably these provisions) must be interpreted through the lens of national interests in health, nutrition, and achieving balance between producers and consumers, and in a manner conducive to technological and socio-economic development (see arts. 7 & 8).²⁴ Arguably, the Declaration gives nations more flexibility than the *Canada-Pharmaceuticals* Panel envisioned.

There are also other flexibilities within the Agreement. Terms such as *invention*, *new*, *inventive step*, *industrial application*, *make*, *use*, *sell*, and *offer for sale* are not defined. And while the Agreement also requires effective enforcement (arts. 41-46), the Panel in another WTO case, *China-Enforcement*, interpreted the enforcement provisions in a manner that is highly

²³ Panel Report, *Canada-Patent Protection of Pharmaceutical Products*, WT/DS114/R (March 17, 2000).

²⁴ World Trade Organization, Ministerial Declaration of November 2001, WT/MIN(01)/DEC/1, 41 I.L.M. 746 (2002); World Trade Organization, Declaration on the TRIPS Agreement and Public Health, WT/MIN(01)/DEC/2, November 20, 2001, 41 I.L.M. 755 (2002).

deferential to national priorities.²⁵ Finally, TRIPS does not adopt rules regarding price controls or ownership of patent rights.

In keeping with the nondiscrimination provision in art. 27 of the TRIPS Agreement, national patent laws are trans-substantive: on their face, they treat all technologies alike. Nevertheless, as Dan Burk and Mark Lemley have cogently argued, the *application* of trans-substantive provisions to individual technologies can lead to law that is tailored to specific fields and national interests.²⁶ The following uses the elements of a patent case—validity, infringement, defenses, and remedies—to demonstrate how countries (principally the United States and the EU) tailor their law to their needs, to specific technologies, and in light of their views on economic and innovation policy. In addition, the United States applies special rules to government-funded inventions produced in certain institutions (mainly universities).

In theory, the varying needs of specific technologies could also be accommodated by varying the patent term. For example, a shorter term might be more appropriate in fields where upfront investment is low, where advances are highly cumulative, or where the field is developing rapidly.²⁷ However, art. 33 of TRIPS makes this form of differentiation difficult. More important, patent drafting is a highly developed art; drafters would surely find ways to write claims that fall into categories where the term is longer. Thus, this form of tailoring is not of practical importance.

A. Validity.

Patents must meet subject matter, novelty, inventiveness, utility, disclosure (specification) and claiming requirements.

1. Patentable subject matter. Despite TRIPS and general agreement on the scope of patent protection, there are many national variations. In the United States, the “default” rules it that “everything under the sun that is made by man” is patentable, with three general exceptions: laws of nature, physical phenomena, and abstract ideas.²⁸ The assumption is that if Congress disagrees with coverage of a new technology, it will legislatively overrule the decision. In Canada, the reverse appears to be true: when a new technology is discovered, Parliament must decide if it is patentable.²⁹ Under the European Patent Convention (EPC),³⁰ exclusions are specifically enumerated. They include scientific theories, aesthetic creations, rules for performing mental acts, business methods, programs for computers, inventions contrary to the public order, plants and animal varieties, methods for treating and diagnosing humans or animals that are practiced on the body (EPC arts. 52.2 & 53). For the European Union, the Biotechnology Directive makes

²⁵ Panel Report, *China-Measures Affecting the Protection and Enforcement of Intellectual Property Rights*, WT/DS362/R (January 26, 2009).

²⁶ Burk and Lemley (n 16).

²⁷ William D Nordhaus, *Invention, Growth, and Welfare: A Theoretical Treatment of Technological Change* (MIT Press 1969).

²⁸ See, e.g., *Diamond v Chakrabarty*, 447 US 303 (1980) (upholding patent on manmade microorganism). See 35 U.S.C. § 101.

²⁹ See, e.g., *Harvard College v Canada*, [2002] 4 S.Ct.R. 45.

³⁰ Convention on the Grant of European Patents, Oct. 5, 1973, 13 I.L.M. 270, 1065 U.N.T.S. 199 (revised at the Convention on the Grant of European Patents Nov. 29, 2000), arts. 52-53.

clear that the exclusion for plants and animals does not include biotechnological inventions, which are patentable so long as they do not involve processes for cloning human beings or modifying cell lines, or the use of human embryos for industrial or commercial purposes (arts. 1 & 6).³¹

The limitations on patentable subject matter reflect a variety of national interests. Laws of nature and principles of nature—which can also be regarded as failing the novelty test (because they have always existed) or the utility test (because in and of themselves, they have no useful applications)—are considered unsuitable subject matter because they are highly generative of multiple downstream innovations and applications. Permitting a patent would create too broad a right and impede, rather than promote, technological progress. This is particularly an issue for **biotechnology**. For example, the pending US Supreme Court case, *Association for Molecular Pathology v Myriad Genetics, Inc.*,³² will determine whether isolated DNA, which is useful in diagnosing disease and developing therapeutics, is a part of nature or changed enough from nature to merit protection. Similarly, courts have rejected patents on simple diagnostics that do little more than relate two phenomena of nature.³³ This approach improves researchers' access to the kind of information that is needed to conduct research advancing society's understanding of the human body. The exclusion also has the side effect of also improving patient access to critical health information.

The exclusion for abstract ideas, scientific theories, mental acts, and computer programs can be explained in a similar way. In addition, they may be unsuitable for protection because they are difficult to claim—to effectively describe limitations to their reach. **Software**, for example, is patentable in the United States. While it is excluded as such under the EPC, much that is inventive in this field can be claimed in Europe through clever drafting. However, the current cellphone wars demonstrate that software patents can often be so broad or indeterminate, rights appear to overlap one another and patent thickets develop. Especially for products that incorporate multiple advances, it becomes extremely difficult to obtain clear freedom to operate. Indeterminate rights often draw patent “trolls”—nonpracticing entities (also called patent assertion entities) that buy these patents and then assert them against successful commercial players. As a result, Richard Posner, a major US jurist, has suggested that patenting is inappropriate in certain fields.³⁴ Thus, he would permit patents in fields such as **pharmaceuticals**, where upfront costs (for developing new molecules and conducting clinical tests) are high and inventions can be claimed clearly (molecules, for example, can be easily described). He would not award them in for software (or more broadly, for various aspects of the **information technology (IT) industry**) where neither of these factors pertains. Significantly, the TRIPS Agreement requires copyright protection for software (art. 10); it does not mention patents on software.

³¹ Parliament and Council Directive 98/44/EC of 6 July 1998 on the legal protection of biotechnological inventions [1998] OJ L213.

³² 653 F.3d 1329 (Fed. Cir.), cert. granted, 132 S.Ct. 1994 (2012).

³³ *Mayo Collaborative Services v Prometheus Laboratories*, 132 S.Ct. 1289 (2012).

³⁴ Richard Posner, ‘Why There are Too Many Patents in America’, *The Atlantic* (12 July 2012) <<http://www.theatlantic.com/business/archive/2012/07/why-there-are-too-many-patents-in-america/259725/>> accessed 28 April 2013.

Concerns about patents in the **IT industry** also derive from two other problems. First, it can be difficult to search the existing literature for software. In contrast to industries where library research is significantly less expensive than inventing, software engineers often write their own programs rather than determine whether there is prior art they can utilize. As a result, independent inventors can find themselves subject to a patent suit. Second, because the upfront costs of writing software are minimal, there will often be sufficient non-patent incentives to make advances in the field. Linux, for example, is supported by people who program for fun and by IBM, which benefits from a free platform on which to run its proprietary software. Much the same can be said about **business methods**. Businesses develop new methods for their own internal purposes and often keep them secret, making it difficult to search the literature before re-inventing. Patents on business methods are specifically excluded by the EPC. Although they are presumptively patentable in the United States, the Supreme Court rejected a set of patents on hedging claims as too abstract to be considered statutory subject matter.³⁵ It is expected that after that case, many fewer business methods will be patented. Since business methods are arguably not “industrially applicable,” patents in the field likely can be excluded consist with TRIPS.

In the United States, **databases** are largely unprotected by intellectual property rights for similar reasons. They are not patentable subject matter because they are not considered technological inventions. While creative selections or arrangements are protectable under copyright, the data (including scientific data) are not protected in and of themselves because they are regarded as facts and outside the ambit of copyright protection. However, the database industry does not lack incentives to compile databases. Often, they are produced for internal purposes. For example, the database in *Feist Publications, Inc. v Rural Telephone Service Co, Inc.*³⁶ was a telephone book in which the plaintiff had alphabetically listed the names, addresses, and numbers of its subscribers; it was published it because publication was required by law; the database in *British Horseracing Board v William Hill*³⁷ was a compilation of information about the horse races run by the plaintiff. Analogously, at one time pharmaceutical companies sponsored free DNA databases because the firms’ comparative advantage lay in developing therapeutics from the information; they did not want to share the profits from the downstream innovations with upstream right holders of DNA patents. For other databases, contractual agreements between the compiler and subscribers provide adequate remuneration to support compilation activities. To date, these contracts are regarded as fully enforceable. Unlike the situation in the United States, databases are subject to sui generis protection in the EU.³⁸ However, early evaluation of the effects of the Database Directive casts considerable doubt on its effectiveness at spurring the growth of the industry.³⁹

Finally, some exclusions are related to issues of morality and public order. The United States leaves it to other regulatory agencies to determine whether an advance is not moral (except that US law excludes patents encompassing a human being). As we saw, the EPC

³⁵ *Bilski v Kappos*, 130 S.Ct. 3218 (2010).

³⁶ 499 US 340 (1991).

³⁷ C-203/02 (ECJ, 9 November 2004).

³⁸ Parliament and Council Directive 96/9/EC of 11 March 1996 on the legal protection of databases [1996] OJ L077/20.

³⁹ Commission of the European Communities. First evaluation of Directive 96/9/EC on the legal protection of databases (Brussels, 12 December 2005) <http://ec.europa.eu/internal_market/copyright/docs/databases/evaluation_report_en.pdf> accessed 28 April 2013.

contains a morality exclusion and it has been imposed to prevent the patenting of **stem cells** and material derived from a cell that could eventuate in a human being.⁴⁰ It remains to be seen whether research in the EU is inhibited by this restriction. Furthermore, many countries exclude **plants** from patentability because they regard their availability as necessary to safeguard nutrition. However, there is no such exclusion in the United States and per TRIPS, every country must have at least sui generis protection for plants. Many do it through the UPOV Convention,⁴¹ which safeguards the interests of farmers and breeders with exemptions permitting farmers to save seed from one growing season to another and allowing breeders to use protected seeds for research purposes. (A general discussion of defenses to infringement is presented below).

2. Novelty. In most patent systems, a rejection on novelty grounds requires that every element of the claimed invention appear in a single piece of prior art (the US calls this the “all elements rule”).⁴² While this requirement is important—for example, it prevents patenting of natural phenomena, natural laws, and old products based on new uses—it is a very rigid requirement. Accordingly, it is not very helpful in distinguishing among technologies.

The one exception is **pharmacology**. In a recent study of the pharmaceutical sector, the European Commission found that originator firms had developed an “evergreening” strategy to prevent generic substitution after patent expiration.⁴³ At one time, a common mechanism was to patent one drug and, towards the end of the patent term, patent its metabolite. No one could take the drug after expiration without (eventually) creating the metabolite and infringing. In the United States, this practice was ended by deeming the metabolite “inherent” in the original drug, rendering the metabolite non-novel.⁴⁴ (Other mechanisms for dealing with “evergreening” are discussed in the next section.)

3. Nonobviousness (inventive step). The nonobviousness requirement demands that the invention be beyond the grasp of a person having ordinary skill in the art (called PHOSITA in the United States). In the United States, for example, the inquiry starts by finding all the prior art that is relevant to the invention, determining the gap between the prior art and the claimed invention, determining the level of skill in the art, and then asking whether PHOSITA can bridge the gap.⁴⁵

The nonobviousness requirement is arguably the most powerful tool for crafting laws that meet national needs and the demands of specific technological fields. First, because the level of skill is different (and changing) for each technology, the nonobviousness requirement automatically adjusts the availability of protection to the maturity of the industry. For example, when **biotechnology** was a new endeavor, the level of skill was considered quite low. At that time, DNA sequencing was difficult and it was easy to show that isolated DNA was

⁴⁰ Case C-34/10 *Brüstle v Greenpeace eV*, Judgment of 18 October 2011 (not yet published).

⁴¹ International Convention of the Protection of New Varieties of Plants, Ger.-Neth.-U.K., Dec. 2, 1961, 815 U.N.T.S. 89 (revised Nov. 10, 1972, Oct. 23, 1978 and Mar. 19, 1991).

⁴² 35 U.S.C. § 102.

⁴³ European Commission, Competition DG, Pharmaceutical Sector Inquiry: Final Report (8 July 2009), <http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/staff_working_paper_part1.pdf> accessed at 28 April 2013.

⁴⁴ *Schering Corp. v Geneva, Inc.*, 339 F.3d 1373 (Fed. Cir. 2003).

⁴⁵ 35 U.S.C. § 103.

nonobvious.⁴⁶ Now that even high school students can sequence DNA, isolated DNA is considered obvious.⁴⁷ In this way, the nonobviousness requirement encourages new technologies because it makes patents easy to get when the level of knowledge in the art is low. When the industry matures, the level of skill in the field grows, which means that more inventiveness is needed to merit protection—which also means that, at that point, the patent system encourages “leapfrogging,” investing in inventing advances that are substantially more sophisticated than what went before. Second, nonobviousness depends on how predictable it is that a particular experiment will be successful. For example, **mechanical** inventions are generally considered more predictable (and hence obvious) than **biotechnological** inventions. In this way, nonobviousness automatically adjusts patentability to the maturity of the underlying science and to the degree of risk inventors and investors undertake.

Because TRIPS Agreement does not define “inventive step,” the nonobviousness requirement also allows countries to adjust their laws to their technological environment. The United States Court of Appeals for the Federal Circuit, the court that hears all patent appeals, at one time set the level of nonobviousness very low. As a result, patent thickets developed and it became increasingly difficult to determine freedom to operate. In *KSR v. Teleflex Inc.*,⁴⁸ the Supreme Court raised the standard, noting that PHOSITA is not an automaton and is capable of taking creative steps, such as adapting an invention made for one purpose to another use. Further, the Court held that market demand must be considered a motivation to invent. The change in approach to **DNA patenting** was a direct result of this decision. More generally, the nonobviousness requirement can be used to deal with cumulative technologies: a higher level of inventiveness will render marginal improvements nonpatentable and will thin the thickets that might otherwise develop. Thus, Burk and Lemley suggest that the problems in the **IT industry** could be ameliorated if PHOSITA were assumed to be highly skilled. Fewer patents would then issue.

Developing countries could also exploit this approach: when local industry is unsophisticated, the inventive step could be set very low so that even less skilled technologists could acquire patents. The availability of protection would, presumably, provide local industry with significant incentives to become innovative. Alternatively, the inventive step could be set very high so that marginal improvements on existing technologies remain accessible. For example, in some places, refrigeration is scarce and it is important for the population to have access to formulations of **pharmaceuticals** that are stable at ambient temperature. If such marginal improvements were considered within the skill of the ordinary artisan, then these formulations could be developed without triggering a new term of patent protection.

As the previous example makes clear, the nonobviousness requirement can also be deployed to deal with the **pharmaceutical industry’s** evergreening problem. Another mechanism for extending patents is to find a new use for old pharmaceuticals. A new product patent cannot be obtained because the product lacks novelty, but the developer could possibly obtain a patent on a process for using the (old) medicine for the new purpose. Viagra, for example, was originally invented to treat angina, but a patent on a process for treating erectile

⁴⁶ See, e.g., *In re Deuel*, 51 F.3d 1552 (Fed. Cir. 1995).

⁴⁷ *In re Kubin*, 561 F.3d 1351 (Fed. Cir. 2009).

⁴⁸ 550 US 398 (2007).

dysfunction remained available. By the same token, the form of an existing medicine can be changed—an isomeric mixture can be separated and the active isomer could be considered a new molecule; the salt form of the medicine could be altered. Under both US and EPC law, these changes will generally be considered patentable. Generic manufacturers may market the old pharmaceutical when its patent expires, but with effective advertising, the patent holder can convince doctors to switch to the newer compound, thus extending the period of effective exclusivity.

To deal with this problem, India's patent law demands a high degree of inventiveness. A new use of a known substance is not patentable; a new use of a known process is not patentable unless it requires a new reactant or results in a new product; and a change in form is not patentable unless it enhances efficacy.⁴⁹ Based on this provision, the Indian courts denied a patent on Glivac (Gleevac), which is used to treat leukemia. The denial of protection not only protects access to Glivac in India and other countries with similar laws (or where it is not patented), the ability to produce it enhances the profits of the strong Indian generic drug sector. It remains to be seen whether India's rigorous definition of the inventive step will be considered TRIPS-compatible.

4. Utility (industrial application). As noted earlier, the industrial application requirement leads some countries to refuse patents on natural phenomena, natural principles, mental steps, scientific theories, computer programs, as well as business and therapeutic and diagnostic methods.⁵⁰ It is also useful in controlling the *timing* of patenting. The prime example is once again drawn from **biotechnology**. In the early years, attempts were made to patent expressed sequence tags (ESTs), isolated partial DNA sequences. Such patents would have created dense patent thickets, with multiple rights in specific genes. The US Patent and Trademark Office (PTO) avoided the problem by issuing Utility Examination Guidelines which requires patentees to disclose a "specific, substantial, and credible utility" for the claimed gene composition.⁵¹ As a result, significantly more work is required before these advances can be patented. In the end, only sequences that can be associated with a specific physical manifestation are regarded as meeting the utility requirement. The race to patent abated and patent thickets were avoided.

5. Disclosure (specification) and claiming. The disclosure requirement demands that a patentee enable a person of ordinary skill in the art to make and use the patented invention. In the United States, the disclosure must also contain a written description of the invention.⁵² All patents must include claims that specify the exact reach of the invention for which a patent is sought; claims may not exceed the scope of the disclosure. Because these requirements also use PHOSITA as a benchmark, they create powerful opportunities for tailoring. Countries that are not yet at the technological frontier and lack absorptive capacity can demand more detailed disclosure than is required of countries with more technologically sophisticated artisans. Similarly, these requirements can be adapted to specific technological arenas.

⁴⁹ India Patent Act, § 3(d).

⁵⁰ See, e.g., 35 U.S.C. § 101.

⁵¹ 66 Fed. Reg. 1092, 1092-99 (Jan. 5, 2001).

⁵² 35 U.S.C. § 112.

Biotechnology is a case in point. As we saw, one problem with upstream biotechnology inventions (such as isolated DNA) is that the patents can be so broad, they impede progress. In the United States, the Federal Circuit has tried to solve this problem with strict disclosure requirements. For example, the party that determined the sequence of the DNA responsible for the production of insulin in a rat also claimed the sequence for the DNA responsible for production of insulin in a human (in this respect, rat and human DNA were known to be very closely related). The patent disclosed the rat sequence, but the human sequence had yet to be determined. Federal Circuit held the patent on the human sequence was invalid on the ground that the patent only provided a written description of the rat sequence.⁵³ The result was a substantially narrower patent; indeed, the human sequence might not have been patentable at all if it was obvious to PHOSITA in light of the rat sequence. Similarly, the Federal Circuit rejected a patent on products capable of reducing NF-κB activity on the ground that the patent provided a description of how to *find* these products, but not a written description of the products themselves.⁵⁴ By rejecting this sort of patent, the court prevented inventors of new research methods from “reaching through” the process patent and acquiring rights over the products found as a result of using the process. The outcome, in short, reduced the power of biotech patents to inhibit competitive development of downstream products.

It should be noted that the interaction of the disclosure and nonobviousness requirement is problematic. In general, the level of skill of PHOSITA is considered the same for both requirements. Accordingly, the harder it is to acquire patent protection (because PHOSITA is deemed to be highly skilled), the less disclosure is required (because PHOSITA is easily enabled). To Burk and Lemley, this is part of the problem in **software**. Software engineers are considered so skilled; programs can be disclosed and claimed in very general terms. In fact, codes and algorithms are often unnecessary so long as the patent discloses the functionality the invention must perform.⁵⁵ But these generalities are one reason that the scope of software claims is so indeterminate. Better would be to assume that PHOSITA is unskilled and needs more information, for that would lead to disclosures that are more detailed—that include algorithms or code—and thus narrower. Further, it would be easier to determine when claims accompanying these detailed disclosures are infringed. A less skilled PHOSITA would, however, dilute the nonobviousness requirement—less would be required to merit protection and that would lead to more patents and deeper patent thickets. Though no country has done so to date, a better approach would be to decouple the determination of PHOSITA in these provisions. Someone seeking to invent could be determined to have a high level of skill, such as the level of skill described in *KSR*, on the theory that only people with a degree of creativity are likely to be inventors. As a result, a great deal of ingenuity would be required to merit protection. In contrast, those seeking to learn from a patent or to read a patent to determine freedom to operate are not likely to be inventors—they are merely followers. Accordingly, they could be deemed to have a lower degree of skill, and therefore to require a higher level of (more detailed) disclosure.

SUMMARY. Validity determinations can be used to deal with problematic features of the patent system. Thus, many countries have devised doctrines to deem inventions of extraordinary social significance not patentable subject matter. The subject matter requirement

⁵³ *Regents of the University of California v Eli Lilly and Co.*, 119 F.3d 1559 (Fed. Cir. 1997).

⁵⁴ *Ariad Pharmaceuticals, Inc. v Eli Lilly and Co.*, 598 F.3d 1336, 1341 (Fed. Cir. 2010) (en banc).

⁵⁵ *Fonar Corp. v Gen. Elec. Co.*, 107 F.3d 1343 (Fed. Cir. 1997).

is, however, a blunt instrument—a decision to deny protection in a specific arena eliminates the possibility of using patents to encourage innovation. For example, this could be a difficult issue in the **biotech sector**. If DNA is found unpatentable, that would free DNA for research and diagnostic purposes, but the rejection would also mean that there would be no patent protection on nature-based DNA products when used therapeutically, and that might discourage promising health-related innovation.

In some areas—**databases, plants**—this problem is solved through sui generis regimes that are better tailored to industrial needs. A proliferation of such regimes would, however also be problematic. It would introduce uncertainty into innovation law and require new international negotiations. To the extent possible, it is therefore better to cope with problems through the use of other provisions of patent law. In the United States, **biotechnology** patents have been substantially narrowed and the number of patents reduced through the utility and nonobviousness requirements. The **IT sector** could similarly benefit from this sort of refinement. Other countries, such as India, have experimented with using the nonobvious requirement for other purposes, such as in the **pharmaceutical industry** to control evergreening and improving access to medicine.

Still, these provisions will certainly allow some patents, including very broad patents, to issue. However, there are post-issuance rules that can also be used as policy levers.

B. Infringement

There are two main issues regarding infringement: interpreting the claims (that is, setting the scope of the patent) and deciding who should be regarded as an infringer.⁵⁶

1. Claim interpretation. In the United States, there are essentially two ways to interpret claims: literally and under the doctrine of equivalents (a third idea is discussed below). For Europe, the EPC nominally covers only the issues administered by the European Patent Office (EPC), which is to say patent validity. A “European patent” consists of a package of national patents and is enforced through national courts under those courts’ domestic laws (so far, there is no Community or Unitary patent). But because the strategy for claiming is heavily dependent on how claims are interpreted, the EPC includes a Protocol on the Interpretation of Article 69 (the article on the scope of protection). The Protocol cautions that interpretation must go beyond the “literal wording used in the claims.” It must be conducted in a manner that “combines a fair protection for the patent proprietor with a reasonable degree of legal certainty for third parties.” The Protocol also provides that “due account shall be taken of any element which is equivalent to an element specified in the claims.” In practice, this means that EPC patents are interpreted a single step, whereas US patents are interpreted in two steps, but the two systems reach roughly the same results for the same reasons. For expository purposes, the US approach will be followed here.

a. Literal Infringement. Literal infringement is determined by comparing each element of the accused product with the elements of the patent claim (another “all elements” rule). In the United States, claims can be formulated in means plus function form, meaning that particular

⁵⁶ See, e.g., 35 U.S.C. § 271.

elements can be claimed by coupling a basic structure to its function. In theory, this significantly broadens claims; in practice, the Federal Circuit, which prefers narrow claims, conducts an element-by-element comparison, asking if the element in the accused product is the *equivalent* of the part of the specification covering the element claimed in means plus function terms. (This is a principle of literal infringement despite its use of the word “equivalent.”).

Because literal infringement uses the same “all elements” test as the novelty requirement, it is—like novelty—a rigid test that does not leave a great deal of room for tailoring. The one exception may be in the **biotech sector**. In *Monsanto Technology LLC v. Cefetra BV*, the European Court of Justice differentiated between DNA molecules that are performing the function for which they are patented (in that case, resisting the herbicide Roundup) and molecules that had ceased to perform that function (in the case, because they were found in soy meal used to feed cattle).⁵⁷ Only the former embodiments can be deemed infringing. German patent law includes a variation of this approach. The scope of gene patents is limited to the disclosed utility.⁵⁸ Under this view, DNA patents would be infringed if used in research (to determine their function in heredity) or therapeutically (to instruct the patient’s body to encourage or suppress particular functions), but they might not be infringed when used as a diagnostic. Control over diagnostics can interfere with access to medical information (the patent holder in the *Myriad* case, for example, holds patent rights over genes associated with early-onset breast cancer and does not permit second opinion testing or quality control). With this approach to literal infringement, important social needs could be safeguarded without sacrificing the incentives patent would bring to the development of new therapies. This approach would not, however, improve the situation for upstream research, where genes are functioning for their purpose. Furthermore, the TRIPS compatibility of this approach has yet to be determined.

b. Infringement under the Doctrine of Equivalents (DOE). Systems provide for nonliteral infringement because without such a doctrine, it would often be extremely easy to avoid patent infringement while still practicing the insights of the invention: all a copyist would need to do would be to change any one element, and the accused product would escape the “all elements” analysis.

In the United States, loosely speaking, infringement under the DOE is analyzed using a function-way-result rubric. As stated by the Supreme Court, “a patentee may invoke this doctrine to proceed against the producer of a device if it performs substantially the same function in substantially the same way to obtain the same result”.⁵⁹ The analysis is made with reference to PHOSITA. An element by element comparison is made; for any element that is different from what was claimed and described in the specification, the court essentially asks whether a person of ordinary skill in the art could have made the change. If it was obvious, it is considered the sort of thing that a copyist should not do; if it was nonobvious, then it escapes infringement. There are two caveats: the patentee cannot capture through the DOE advances that would have been

⁵⁷ Case C-428/08, *Monsanto Technology LLC v Cefetra BV and Others* [2010] ECR I-6765..

⁵⁸ Gesetz zur Umsetzung der Richtlinie über den rechtlichen Schutz biotechnologischer Erfindungen [Statute Implementing the EU Biotechnology Directive], Jan. 21, 2005, BGBl. I at 146, §1a (4) (F.R.G.). PatG § 1a(4). France has adopted a similar approach, see Code de la Propriété Intellectuelle Art. L613-2-1.

⁵⁹ *Graver Tank & Mfg. Co. v Linde Air Products Co.*, 339 US 605, 608 (1950).

considered nonnovel or obvious on the patent's priority date. Furthermore, the patentee cannot capture inventions surrendered during examination ("prosecution history estoppel").⁶⁰

Note that while this test looks a great deal like nonobviousness, under US law, there is a temporal shift. In nonobviousness, the capacity of PHOSITA is determined at the time of invention (or filing); here it is determined by the state of the art at the time of infringement. Thus, later-developed technologies can be regarded as an obvious substitution.

Because it references PHOSITA, the doctrine of equivalents can be a powerful tool for tailoring. Economists split, however, on how (and whether) it should be used. Traditionally, it has been used to protect "pioneer" inventions—inventions that open a new field. The theory is that opening a new field requires very strong incentives and these can be increased by expanding the reach of the patent. Indeed, the DOE is arguably especially important for pioneers because the first version of a new technology is rarely user-friendly enough to be commercialized successfully. Unless the patent is interpreted to read on improvements, the pioneer may earn no return at all. Furthermore, some liken patents to mining claims, and think of them as giving one party the power to orchestrate efficient development of the "prospects" the earliest invention uncovers.⁶¹ For mining claims to work, they must accord broad protection to pioneers. Finally, broad protection encourages the next generation to "leapfrog" and push the technological field further more quickly.

Recently, however, economists have questioned this logic. If, as suggested, the earliest patents in a field require considerable development, a strong case can be made that this development is best accomplished competitively. Giving a broad scope to the doctrine of equivalents is much like patenting upstream research inputs: the patentee's control can impede, rather than promote, progress.⁶² Thus, some economists argue the doctrine of equivalents should be interpreted very narrowly when the inventor is a pioneer.

The controversy over the DOE is in essence, a dispute over the viability of contracting. Those who believe in broad pioneer patents are contracting optimists—they think the patentee will widely license out the right to develop applications because competitive development is in his interest—the patentee will make more money if more and better applications are developed. Contractual pessimists doubt patentees will always act rationally. They may have insufficient information to evaluate potential licensors and either refuse to license or do it badly; they might fear superseding inventions will cannibalize their own product or process; they may have an overly optimistic view of the value of their contributions. In some arenas (for example, university licensing), the licensor and licensee may have very different objectives and thus may find it hard to find a mutually agreeable position. Contractual pessimists therefore suggest that the pioneer patentee's rights be limited so that the public is free to further develop the pioneer prospect.

The DOE can be modified to deal with the problem mentioned above in connection with the **IT industry** and **business methods**. As we saw, in both arenas, independent invention is

⁶⁰ See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.*, 535 US 722 (2002).

⁶¹ Kitch (n 7).

⁶² Merges and Nelson (n 14).

more prevalent—and often more efficient—than looking for solutions to problems in the prior art. Accordingly, independent inventors often get caught up in enforcement actions—a patentee asserts a patent the later inventor was not aware of and did not learn from. The Federal Circuit has suggested that in these cases, the DOE should not be applicable. The doctrine is equitable in nature, accordingly the court has discretion on whether to find infringement. Furthermore, independent inventors sink similar costs to those paid by the pioneer and thus cannot undercut its market. The Supreme Court has, however, rejected this analysis thus far: direct patent infringement is a strict liability offense. Because of TRIPS’ technological neutrality principle, it is likely a WTO member adopting this approach would have to apply it to all fields of technology. However, it is likely to have its most important application in these sectors.

c. The Reverse Doctrine of Equivalents. As noted in the lead-in to this section, there are only two ways to interpret claims. However, the US Supreme Court has also suggested that “where a device is so far changed in principle from a patented article that it performs the same or a similar function in a substantially different way, but nevertheless falls within the literal words of the claim, the doctrine of equivalents may be used to restrict the claim and defeat the patentee’s action for infringement”.⁶³ In modern times, no court has ever decided a case on reverse DOE grounds. However, economists who favor narrow patents strongly suggest the doctrine should be revived as a way to foster downstream competition and avoid the possibility that a patentee will acquire rights over technology he could not possibly have invented. **Biotechnology** provides an example. In the one case in which the Federal Circuit cited the reverse DOE, the patentee had produced a human clotting factor by concentrating it from human plasma. The accused infringer made it by biochemically, through a recombinant process using monoclonal antibodies. Its procedure made a much purer and safer product. The question was whether the patent on the growth hormone was infringed by the new preparation. The Federal Circuit returned the case to the trial court, suggesting that the reverse DOE might apply.⁶⁴ The case was, however, ultimately resolved in a different way.

2. Parties to Infringement. Most enforcement actions are brought against parties who are directly practicing the claims. However, it is possible to sue those who aid and abet infringement (inducers of infringement) and those who contribute to the infringement of others by selling them material whose main use is to infringe (contributory infringers). In both cases, a degree of knowledge of the infringement is necessary; in both situations the defendants are treated as equivalent to infringers. Parties who supply components to foreign markets knowing they are specially adapted to infringement and parties who import goods made with processes patented in the country of importation are also treated as equivalent to infringers. (Note that tying goods to patent licensing requirements could be considered a violation of competition law. That issue is discussed in the competition section).

For the most part, these approaches work equivalently in all forms of technology. However, they assume particular importance in the case of **mechanical** inventions, where many parts are often necessary to practice the invention. The importation provision is especially important in the **biotech sector**, where it would otherwise be possible to produce nonpatented

⁶³ *Graver Tank & Mfg. Co. v Linde Air Products Co.*, 339 US 605, 608-609 (1950). See also *Westinghouse v Boyden Power Brake Co.*, 170 US 537 (1898).

⁶⁴ *Scripps Clinic & Research Foundation v Genentech, Inc.*, 927 F.2d 1565, 1580 (Fed. Cir. 1991).

products (such as insulin) using a patented biological process in an “information haven,” and then sell the product internationally. The **IT sector** also has a strong interest in these doctrines. In some parts of the sector, it is possible to split infringement among jurisdictions. For example, Blackberry cellphones are popular in the United States but parts of the operation are located in Canada. Since patent law is territorial, all the elements in a patent claim must be practiced in a single jurisdiction. In addition, the sector is concerned because of the possibility of divided infringement—interactive software is practiced by more than one party and if each party must practice every element of the claim, then no party is liable for infringement. In many jurisdictions, concepts of contribution and inducement allow the courts to find both, or one of the parties to be infringers. (In some cases, liability is alternatively predicated on concepts of beneficial use or vicarious responsibility).

SUMMARY. Approaches to interpretation hold scope for differentiating among technologies. To date, however, the main use has been to protect pioneer patents and economists now question whether that approach is correct. Furthermore, many commentators question whether it is appropriate to vary the interpretation of the claims according to the technology. Patents are public documents; they are used by rivals to determine freedom to operate. Investors use them to decide whether to provide capital to inventors. Other firms use them to evaluate potential targets for acquisition and merger. For these purposes, it is helpful if the approach to interpretation does not vary significantly from field to field. The determination of who is an infringer must, however, be sensitive to the way inventions in different technologies are practiced.

C. Defenses to Infringement

Because validity and infringement analysis look first and foremost at the invention, defenses to infringement are a crucial means for balancing the proprietary interests of the patentee against the access interests of competitors, of consumers of patented technologies, and of the state. Defenses (including awards of compulsory licenses) also offer the most targeted way to deal with special problems. As noted above, TRIPS permits exceptions (art. 30) and compulsory licenses (art. 31) under certain highly constrained conditions, including to deal with blocking patents (art. 31(I)). In *Canada-Pharmaceuticals*, a WTO Panel required that even exceptions meeting the standards of art. 30 be technologically neutral (art. 27.1). Even so, defenses can focus on problems arising in specific fields. First, it is not clear that the Appellate Body of the Dispute Resolution Board will agree with the Panel decision: art. 30 requires that exceptions be “limited” and a provision targeted at a particular field is more limited than a technologically neutral one. Second, the Panel acknowledged that a particular field might raise a special problem. So long as the provision is not facially limited to one field (so that any other field with a similar problem will also benefit), the Panel held that the provision would not be regarded as discriminatory.

The reverse doctrine of equivalents, discussed above, can be analyzed as a defense to infringement. Other defenses include defenses for socially significant uses, for government use, and in favor of prior users. Patentees’ prerogatives can also be limited by the exhaustion doctrine, various doctrines related to bad acts (such as patent misuse), and competition law. Exhaustion and competition law are discussed separately below.

1. Socially significant uses.

a. Research. The predominant exemption in the socially significant category is the research defense. As we saw in connection with the **biotech sector**, the patenting of upstream research inputs (such as isolated DNA) can impede progress by decreasing the opportunity for competitive development of research prospects. While a subject matter exclusion would eliminate this danger, it would also eliminate the use of patents to incentivize innovation in the excluded area. A well-crafted research exemption can split the difference. Commercial use of the invention is made subject to the patent, while researchers are allowed to freely explore new research prospects. Thus, many countries recognize a general exception for research uses—in some countries, all research uses; in others, noncommercial uses.

To many countries, **research tools** are a category of their own, for if they were subject to the exemption, then the market for selling or licensing these tools could be significantly diminished. Thus, many countries distinguish between research *with* a patented invention, which is not permitted, and research *on* a patented invention (for example to learn how it works, to determine whether it accomplishes the utility stated in the patent, to find other uses of the invention), which is permitted.

In the United States, the availability of a research defense is in doubt because in *Madey v Duke University*, the Federal Circuit held that a research exemption is not applicable to work carried out as part of the business interests of the defendant.⁶⁵ Thus, research institutions—such as universities—apparently cannot use the research defense. Nevertheless, surveys by economists suggest that research scientists tend to ignore patents.⁶⁶ They are rarely sued, perhaps because they are judgment proof; perhaps because patent holders are better off allowing them to find new applications and then suing them after these applications have been developed. However, there is empirical work suggesting that research diminishes when significant inputs are patented⁶⁷ and some observers believe that the pressure to narrow the definition of patentable subject matter would diminish if the availability of inputs for research purposes were assured. Many universities have taken matters into their own hands and now refuse to grant licensees rights to control university research uses (and sometimes all research benefiting neglected populations).

⁶⁵ *Madey v Duke University*, 307 F.3d 1351(Fed.Cir. 2002).

⁶⁶ Wesley M Cohen and John P Walsh, ‘Access—or Not—in Academic Biomedical Research’ in Rochelle C. Dreyfuss, et al (eds), *Working Within the Boundaries of Intellectual Property: Innovation Policy for the Knowledge Economy* (n 12) 3-28; John P Walsh, Ashish Arora and Wesley M Cohen, ‘Effects of Research Tool Patents and Licensing on Biomedical Innovation’ in Wesley M Cohen and Stephen A Merrill (eds), *Patents In The Knowledge-Based Economy* (National Research Council 2003) 285.

⁶⁷ Kenneth G Huang and Fiona E Murray, ‘Does Patent Strategy Shape the Long-Run Supply of Public Knowledge? Evidence from Human Genetics’ (2009) 52 *Academy of Management Journal* 1193; Fiona Murray and Scott Stern, ‘Do Formal Intellectual Property Rights Hinder the Free Flow of Scientific Knowledge? An Empirical Test of the Anti-Commons Hypothesis’ (2007) 63 *Journal of Economic Behavior and Organization* 648. Cf. Heidi L Williams, ‘Intellectual Property Rights and Innovation: Evidence from the Human Genome’ (Working Paper No. 16213, National Bureau of Economic Research Working Paper, 2010) <<http://www.nber.org/papers/w16213>> accessed 1 August 2011 (work protected by agreements of confidentiality).

In Europe, the Draft Community Patent Regulation, as well as national patent statutes recognize an experimental use exception.⁶⁸

In common with many WTO countries, the United States does recognize a research exemption focused on the **pharmaceutical industry**. Under the so-called Bolar exemption,⁶⁹ generic drug manufacturers can conduct research using patented medicines during the patent term so long as the research is intended to generate data needed by authorities regulating drugs and veterinary biological products. In the United States, patentees are granted an extension of their period of exclusivity in exchange for tolerating the use, on the theory that patentees lose part of the term generating their own data for the regulatory authorities. Other countries have similar provisions, though some (including Canada) do not provide patent holders with extensions. This is the provision that was approved in the *Canada-Pharmaceutical* (art. 30) case.

Strong arguments can be made that an analogous exemption should be recognized for **software**, where there is considerable consumer demand for interoperable and backwards-compatible products. In some cases, it is necessary to work with patented software to find the application program interfaces (APIs) or other material, such as validation codes, needed to create such products. Patentees regard these uses as infringement in order to protect their initial markets and their markets for peripherals and other compatibles. But economists have suggested a reverse engineering defense that would operate along the lines of a research defense would improve competition.⁷⁰ Article 6 of the EC Software Directive, harmonizing copyright protection of software across the EU, also authorises the decompilation of “parts of a software program”, without the permission of the copyright holder, if this was “indispensable to obtain the information necessary to achieve the interoperability of an independently created computer program with other programs”.⁷¹

b. Diagnostics. As we saw, many countries exclude diagnostics from patentability. However, these provisions usually apply only to diagnoses conducted directly on the body (e.g., examining the heart with a stethoscope). Modern techniques involve laboratory examination of biological samples and relating phenomena to each other (for example, relating a DNA sequence to vulnerability to disease or to the beneficial effect of a drug). These correlations could be excluded from patentability to protect patient access to the test and to second opinion testing, and to allow agencies to monitor quality. Other approaches include would exempt all diagnostics, exempting diagnostics used for second-opinion testing, or quality-control from infringement liability, or compelling those holding patents on diagnostics to agree to license. No country has taken such actions as yet.

⁶⁸ Article 9(b) of the Draft Community Patent Regulation (noting that “acts done for experimental purposes relating to the subject matter of the patented invention” are not found to infringe the patent); Article 60(5) of the UK Patent Act of 1977 provides also for an experimental use exception as well as in situations where the infringement act of the patent is done privately and for purposes that are not commercial.

⁶⁹ 35 U.S.C. § 271(e)(1). The exception is named for *Roche Products, Inc. v Bolar Pharmaceuticals, Inc.*, 733 F.2d 858 (Fed. Cir. 1984), the case that focused attention on the problem of timing the research necessary for generic substitution.

⁷⁰ Mark A Lemley and Julie E Cohen, ‘Patent Scope and Innovation in the Software Industry’ (2001) 89 California Law Review 1.

⁷¹ Parliament and Council Directive 2009/24/EC of 23 April 2009 on the legal protection of computer program [2009] OJ L111/16.

c. Supplying the market. Some countries will award compulsory licenses in cases where the patentee fails to adequately supply the market. This is especially prevalent in the **pharmaceutical sector**, where inadequate supplies can lead to serious health problems. Originally, the TRIPS Agreement permitted such licensing only to predominantly supply the local market (art. 31(f)). However, many countries cannot manufacture pharmaceuticals. In the Doha Declaration, the WTO Ministerial Conference agreed to alter the Agreement to permit one nation to award a compulsory license in favor of another country. These licenses must follow strict conditions to prevent the drugs from flowing into countries where supply is adequate (art. 31bis). Analogously, countries that do not usually permit parallel importation (see below) may lift that ban in cases where the patentee refuses to adequately supply the market, or does not offer goods at prices comparable to those charged in other markets.⁷²

d. Working. There are countries that take the position that patents should promote local employment and technological training. Under the Paris Convention, countries were permitted to issue compulsory licenses if the patentee failed to work the patent locally in a specified time period (3-4 years) (art. 5). However, the TRIPS Agreement does not permit discrimination on the basis of whether a product is locally produced or imported. Accordingly, TRIPS can be interpreted as overriding this provision. Paris has, however, been incorporated into TRIPS (art. 2.1). Accordingly, many believe that such licenses can still be awarded. The United States generally regards the patentee as competent to decide when it is efficient to work the patent in the country. Accordingly, it does not use working requirements.

Some jurisdictions outside the United States also provide that a compulsory license can be awarded for refusals to license on reasonable terms.⁷³ These provisions are rarely invoked in court because their *in terrorem* effect tends to induce voluntary licensing. These provisions are typically aimed at blocking patent situations. They would also be useful in the **biotech** arena, to induce firms holding rights over important diagnostic and research inputs to license or to pool their patents. It might also be helpful in sectors, such as **IT and semiconductors**, where multiple inputs are needed to bring products to market.

2. Government use. The United States does not recognize patent infringement by the United States. Instead, the law provides that when a patented invention is “used or manufactured by or for the United States without license,” the patent holder can bring an action for “reasonable and entire compensation” in the United States Court of Federal Claims.⁷⁴ Other nations have similar provisions.

3. Prior users. As we saw earlier, in the **IT sector** and with respect to **business methods**, searching the prior art is difficult. If art is sufficiently obscure (e.g. a trade secret), it may not qualify as prior art for purposes of determining novelty and nonobviousness. In such cases, a

⁷² See, e.g., Australian Government, Productivity Commission Report, *Restrictions on the Parallel Importation of Goods* (2009).

⁷³ See, e.g., Patents Act, 1977, c. 37, § 48A(1)(b)(i) (Eng.); 2 John W Baxter, *World Patent Law and Practice* § 8.02 (2001); see also Robert Merges, ‘Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents’ (1994) 62 *Tennessee Law Review* 75, 104.

⁷⁴ 28 U.S.C. § 1498.

later inventor can acquire a valid patent. The first user could then find himself an infringer. To avoid that result, at one time, the United States provided a defense in favor of those who used a business method invention earlier than a specified time before a patent application on the method was filed. While the defense was only available to business methods, it covered methods of doing business with a computer and thus also served much of the **IT** community. In first to file systems, a prior user right is available in all sectors, to anyone who begins to use the invention for more than a specified time prior to filing.⁷⁵

4. Bad acts. In the United States, a patent is unenforceable in its entirety if any claim was acquired through knowing deception of the patent office (e.g. by intentionally withholding prior art that is material to the patentability decision). All sectors are equally affected by this “inequitable conduct” defense.

In some systems, abuse of the patent is also regarded as a bad act. Under the doctrine of “patent misuse,” the patent is unenforceable until the misuse is purged. At one time, many activities were considered misuse, including tie-ins, tie-outs, package licenses, price fixing, and grant backs. The defense differed from a competition law violation in two ways: there was no requirement to prove a dominant market position and the only result of proving misuse was unenforceability (in contrast, competition violations require proof of dominance and a successful patentee is awarded damages). Many observers believe that patent misuse would be very useful in the **biotech sector** and the **IT sector** (particularly for **semiconductors**). In these industries, multiple patented inputs are needed to bring products to market and there is considerable danger that one patentee will hold out and demand a disproportionate share of the profits. If holding out were deemed misuse, the risk that one patentee would block commercialization would disappear: patentees would be induced to license their patents individually or through pools. The refusal to license important upstream inputs or inventions important to public health could also be deemed misuse. Nevertheless, in recent years the United States has largely decided that conduct that is not regarded as a competition problem should also escape consideration as misuse. Thus, the doctrine has been folded into competition law, which is discussed below.

SUMMARY: Defenses to infringement are the most direct way to cure problems in the patent system. They are particularly useful in connection with scientific inputs, such as in the **biotechnology, pharmaceutical, and IT sectors**, and for refusals to license locally on reasonable terms.

D. Remedies

There are three main remedies to infringement: injunctive relief, monetary damages, and control over importation. All are required by TRIPS, but the WTO accords a great deal of deference to national choices. Authorities must “have the authority” to award relief, but they need not exercise that authority in every case, so long as the over-all scheme deters infringement. Thus, the three forms of relief offer ways to deal with problems arising in particular sectors.

1. Injunctive Relief. Because intellectual property is a right to exclude third parties, the injunction is the premier form of relief in that it restores exclusivity. Nonetheless, in recent years,

⁷⁵ 28 U.S.C. § 273.

the United States Supreme Court has emphasized the equitable nature of injunctive relief. In *ebay v. MercExchange*, it held that before a court may grant an injunction, it must consider the public interest.⁷⁶ This decision is particularly important in the **IT sector**, where we saw that the indeterminacy of **software** claims, the difficulty in searching the prior art, and the number of patents needed to bring a product to market (especially in the **semiconductor segment** of the industry) can cause very difficult problems, such as the vulnerability of independent inventors to suit, opportunistic litigation by nonpracticing entities, and holdup problems. Refusing to grant injunctions (and instead requiring the payment of royalties) is, in some ways, the functional equivalent of compulsory licensing. Knowing that an injunction will not be awarded, patentees will be more likely to negotiate deals on their own rather than have the court calculate royalties.

Arguably, however, this approach, which works *ex post* (i.e. after a suit is fully litigated) is inferior to one that permits courts to award compulsory licenses *ex ante* (that is, before resources are invested in infringing activities). For example, it cannot cure problems in the **medical sector**, where refusals to license can reduce access to medicine or to diagnostics: no one will invest in manufacturing or diagnostic equipment without knowing whether the court will withhold injunctive relief. In the United States, however, there is a limited alternative: health care providers who are guilty of infringement are not required to cease activities *or* to pay royalties. Instead, actions for contributory infringement or induced infringement can be brought against parties who supply critical inputs, knowing they will be used for infringing purposes.⁷⁷

2. Monetary damages. Monetary damages are awarded to make the patentee whole for past infringements and to deter infringement. In recent years, a great deal of attention has focused on the calculation of damages, particularly in the **IT sector**. One problem is that if damages are calculated based on what the infringer would have paid had he licensed rather than infringed, there will be no deterrent effect. But if damages are increased to deterrent levels, then in fields where there are nonpracticing entities, the high level of recovery will attract opportunistic litigation.

Second, when many inputs are needed to bring a product to market, it can be difficult to determine the value the patent invention added to the total product. In the past, patentees were able to recover an amount based on the entire market value of the product. That acted as a tax on innovation and it attracted nonpracticing entities. In *Lucent Technologies v. Gateway*, the Federal Circuit announced that henceforth, damages will be apportioned, so that a successful defendant will collect only the value its advance contributed to the success of the product.⁷⁸

Third, in cases, such as **software**, where it is difficult to search prior art, patents will often be infringed inadvertently, yet once the product is sold, it is difficult to replace the infringing component. In such cases, the new approaches to remedies can be combined. An injunction will be denied for a period of time that is sufficient to work around the infringing

⁷⁶ *eBay Inc. v. MercExchange, L.L.C.*, 547 US 388, 391 (2006) (“a plaintiff seeking a permanent injunction must satisfy a four-factor test before a court may grant such relief. A plaintiff must demonstrate: (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction”).

⁷⁷ 35 U.S.C. § 287(c).

⁷⁸ *Lucent Technologies, Inc. v. Gateway, Inc.*, 580 F.3d 1301 (Fed. Cir. 2009).

component. During that time (and to account for past infringement), money damages will be awarded, but the amount will be limited to the value the advance added to the product.

It should also be noted that Richard Posner, the noted critic of patents in the **IT sector**, recently dismissed a cellphone case when sitting as a district judge, claiming that damages for infringement could not be proved with sufficient certainty.⁷⁹

3. Border actions. Under TRIPS, members must give customs authority the power to prevent counterfeit and pirated goods from entering the market; they may also bar entry to other goods (art. 51). In the United States, this power is exercised in patent cases only when the patentee makes the invention commercially available (through local working or importation), or is in the process of developing this capacity. In that way, public availability of the invention is somewhat assured (even though the patentee can bring infringement actions against those who make, use, sell, offer to sell, or import the product).⁸⁰

SUMMARY. Adjustments to relief can be used to deal with patent thickets, holdups, and other licensing problems. However, the system is *ex post*; it is not an efficient way to induce optimum levels of exploitation and licensing.

E. Government funded inventions.

In the United States, patents on certain government-funded inventions are subject to special rules on the theory that the public pays for them twice, once in taxes to fund the research, and the second time through the supracompetitive purchase price. These rules further the government's interests in creating new high tech jobs, bringing academia and industry into close contact, and assuring access to government-supported research.

The US government supports research both intramurally (in government laboratories) and extramurally, mostly by financing scientists working in universities and other research institutions. On the whole, the extramural funding is dispensed through peer-reviewed research proposals, a process that is administered by various federal agencies. Rights over the fruits of intramural research are owned and exploited by the government. At one time, the same was true of university-based research: the government took all patent rights and generally licensed them out on a nonexclusive basis. This changed in 1982, when the Bayh Dole Act went into effect.⁸¹

The Bayh Dole Act seeks to promote the commercialization of federally-supported inventions and collaboration among scientists in universities and industry. The Act retains government ownership as a default position. But it effectuates the goal of bringing academia and industry in closer contact by allowing certain “contractors”—small businesses and nonprofit organizations (mainly universities) that are parties to government funding contracts—to elect to retain title to inventions that arise from federally funded research. If neither the funder nor contractor wishes to patent, the inventor may pursue patent rights. The rights acquired are subject

⁷⁹ *Apple, Inc. v Motorola, Inc.*, 869 F.Supp.2d 901 (N.D.Ill. 2012)(Posner, J., sitting by designation).

⁸⁰ See 19 U.S.C. § 1337. Importation actions are brought in a special tribunal, the International Trade Commission.

⁸¹ 35 U.S.C. §§ 200-212. See also 15 U.S.C. §§ 3701-3714 (the Stevenson-Wydler Technology Innovation Act of 1980), which applies to certain entities other than universities.

to various constraints.⁸² Funding agreements can exempt foreign contractors and those under the control of another government. A funding agency can also deny rights of election when the research is of national interest or when it determines that government ownership would “better promote the policy and objectives” of the Act.⁸³ After transfer, the United States enjoys a nonexclusive, nontransferable license to practice or allow others to practice the invention on its behalf; funders can also demand similar rights under foreign patents.⁸⁴ Periodic reporting of commercialization efforts is required,⁸⁵ if the funder determines that the invention has been insufficiently exploited, it can “march in” and acquire rights to the invention.⁸⁶ Government retention or reacquisition is not, however, easy: there are cumbersome requirements and a right of review. In fact, the United States has only rarely withheld patent rights and has never successfully marched in, even in situations where the right was clearly underexploited.⁸⁷

The Act imposes certain other safeguards as well. The contractor must ensure that rights can be secured.⁸⁸ Significantly, it must share the royalties received with the inventors; in most cases, it must plow its profits back into support for scientific research or education; excess earnings (measured by comparing profits to institutional budgets) must be returned to the US Treasury; licensing programs must prefer small businesses and US industry.⁸⁹ If reasonably possible, all exclusive licenses must be to entities that agree to produce products embodying the invention or using the invention “substantially in the United States”.⁹⁰ The Act thus assures that faculty members are motivated to participate in licensing activities, that there is enough contact among the parties to promote a healthy interchange of ideas and skills, and that the public’s tax expenditures are redound to the benefit of the US taxpayer through both better products and better jobs.

The Act’s main significance has been in the **biotech** sector, where much of the research is conducted by universities with support from the National Institutes of Health (NIH). As we have seen, biotech and medical research may be impeded by the many fundamental research and medical inputs are patented (DNA, research tools). Because the safeguards in the Bayh Dole Act have not been used and United States does not recognize a general research exemption, the NIH has sought to impose limitations through its funding agreements. It has asked universities to license nonexclusively (or by field of use) when possible—usually, when the invention is close enough to commercialization that the licensee need not to invest significant resources. In that way, NIH seeks to increase competition and reduce the risk of holdups. Some funding agreements require universities to state their plans for exploitation and dissemination of the work

⁸² § 202 (a), (c) & (d).

⁸³ § 202(a)(i)-(iv).

⁸⁴ § 202(c)(4).

⁸⁵ § 202(c)(5).

⁸⁶ § 203.

⁸⁷ Arti K Rai and Rebecca E Eisenberg, ‘Bayh-Dole Reform and the Progress of Biomedicine’ (2003) 66 *Law and Contemporary Problems* 289.

⁸⁸ 35 U.S.C. § 202(c)(1) & (2).

⁸⁹ § 202 (c)(7).

⁹⁰ § 204.

they do. In addition, many universities have voluntarily undertaken to license in ways that safeguard public interests.⁹¹

III. THE INTERACTION BETWEEN COMPETITION LAW AND IP LAW

A. Legal framework and goals of competition law

Competition law (or antitrust law in the United States) has developed as a separate area of law in the late 19th century, when US Congress enacted the Sherman Act in 1890 with the aim to prohibit certain business activities deemed to be anticompetitive, in particular cartels (Section 1 of the Sherman Act) and monopolization (Section 2 of the Sherman Act). Although the Sherman Act today still forms the basis for most antitrust litigation, US Congress enacted the Clayton Act (which specifically prohibited exclusive dealing agreements, tying agreements and interlocking directorates, and mergers achieved by purchasing stock) and the FTC Act in 1914 (establishing the Federal Trade Commission and providing it with the power to investigate and prevent deceptive trade practices (Section 5 FTC Act). US antitrust law is enforced by the generalist courts (at the federal and state level), the Federal Trade Commission and the Department of Justice-Antitrust Division (for criminal investigations, such as cartels).

Established by the Treaty of Coal and Steel in 1951 and the Treaty of Rome on the European Economic Community in 1957, the competition law provisions of the European Union (EU) Treaties have remained largely unchanged since, despite the various modifications of the constitutive Treaties and the merging of the European Economic Communities within the European Union in the Treaty of Lisbon in 2009. Article 101 (1) of the Treaty on the Functioning of the European Union (TFEU) prohibits agreements, concerted practices and decisions of associations of undertakings that have as their object or effect to restrict competition and affect trade between Member States. The different elements of Article 101(1) have been interpreted by the case law of the European courts. Article 101(3) provides that practices that fall within the scope of article 101(1) may not be found illegal under Article 101 and are thus not subject to the prohibition principle if they 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. In order to benefit from Article 101(3) restrictive agreements should not impose on the undertakings concerned restrictions which are not indispensable to the attainment of these objectives or should not afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products in question. Article 101(2) TFEU deals with some of the civil law effects of Article's 101(1) prohibition. The Commission benefits from a broad regulatory competence in adopting measures of general application. The Commission has, indeed, adopted regulations that exempt categories of agreements from the prohibition of Article 101(1), under Article 101(3), in specific circumstances. These texts are completed by an array of guidelines, communications, notices, priority guidance, best practices, annual reports, oral statements, press releases, guidance letters, expert reports and third party studies, which provide invaluable information for the enforcement of competition law. Article 102 prohibits the abuse by one or more undertakings of a dominant position within the internal market or in a substantial part of it in so far as it may affect trade between Member States. Both articles 101 and 102

⁹¹ AUTM, 'Nine Points to Consider in Licensing University Technology' (6 March 2007) <http://www.autm.net/Nine_Points_to_Consider.htm> accessed 1 August 2011.

provide examples of prohibited or abusive conduct. However, this list is not exhaustive and the case law of the European courts as well as the decisional practice of the Commission show an extensive interpretation of these provisions, leading, for example, to the expansion of the application of article 102 to situations where the dominant position is detained by more than one undertakings (collective dominant position) or to situations where the abuse and the dominant position are not on the same relevant market. The Court's case law has not though expanded the application of Article 101 TFEU to situations of tacit collusion if there is no evidence of some degree of concentration between the undertakings: parallel behavior does not constitute evidence of an illegal concerted practice or agreement. There was no effective system of merger control in the European Communities,⁹² at least until the first EC Merger regulation (ECMR) was implemented in 1989.⁹³ The regulation established a centralized preventive and one-stop shop merger control system with a suspensory (to unauthorized mergers) effect. The competence for the examination and the decision in merger cases with a Community dimension lies exclusively with the European Commission. Member States are free to develop their own merger control systems for mergers without a Community dimension. This report focuses on the application of Articles 101 and 102 TFEU to practices involving IP rights and does not examine merger control, although some of the issues raised are similar. EU competition law is enforced by the European Commission (in particular the Directorate General for Competition or DG Comp), national competition authorities and national courts of the EU Member States. The Court of Justice and the General Court of the EU interpret the provisions of EU competition law and (for the General Court) perform a control of legality to the decisions of the European Commission in this area.

The view that competition law should aim to promote some form of economic welfare is intrinsically linked to the influence of economics and in particular welfare economics, consumer theory and related fields in competition law analysis and is valid for both US antitrust law and EU competition law. There are different views over the meaning of economic welfare and how this may be measured. First, competition authorities and courts may examine the efficiency of a change from one competitive situation to another adopting a "total welfare standard". The latter is a measure that aggregates the surplus of different groups in the economy (e.g. producers, consumers) and measures the welfare consequences of the change. It is important that total (consumer and producer) surplus increases, even if the surplus of one of the groups (consumers or producers) diminishes. Only the size of the economic pie matters, not its distribution among each group. From a total welfare perspective the objective of competition law enforcement should be to ensure the maximum level of efficiency for all these categories. This includes allocative efficiency, for example, the possibility for consumers to pay a price that corresponds to their willingness to pay or in some cases less than their willingness to pay (leading to consumer surplus). It should also include the possibility for producers to use production processes that yield the highest output levels for a given set of inputs or for consumers the

⁹² Neither the Treaty of Rome nor the German GWB provided any specific provision for controlling mergers, with the exception of Art. 66(1)-(6) of the European Coal and Steel Community (ECSC) Treaty, which established an exclusive competence for the High Authority of the ECSC without any residual competence to Member States for establishing national merger control and without the requirement of an effect on trade between Member States.

⁹³ Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings [1989] L395/1. The case law of the European court of Justice had however extended the scope of application of Articles 101 TFEU (Joined Cases 142 and 156/84 *BAT* and *Reynolds v Commission* [1987] ECR and 102 TFEU to economic concentrations.

possibility to enjoy innovative products and services, what is usually referred to as dynamic efficiency. Finally, one should take into account the scale efficiencies producers may enjoy, enabling them to reduce the production costs of a specific good (productive efficiency) and thus to raise their surplus in the sense that if a producer has a willingness to sell, and the market price for a good is above that price, then they would be able gain a surplus equal to the gap (producer surplus).

One might take a static view of efficiency (what is the current or short term situation of consumers and suppliers on the market) or a dynamic view which is concerned with the long run evolution of the market (focusing on encouraging research and development). In some circumstances there might be tension between static allocative efficiency and dynamic efficiency. As it is explained in a Canadian Bureau of Competition commissioned report on Innovation and Dynamic Efficiencies,

“(t)o sustain innovative efforts, and thus support dynamic efficiency, firms do not expect to price at short-run marginal cost at every point in time and as a result some degree of allocative inefficiency may be inevitable. Motivating firms to make costly investments in R&D requires some prospect of “profit,” which as noted above is in the form of quasi-rents. In the absence of this positive return per unit of output sold, a firm would never be able to recoup its up-front investment in R&D, and would therefore have no incentive to undertake this investment. In other words, innovating firms anticipate a period of “incumbency” during which they are able to sell a product at a price exceeding not only the short-run marginal cost of production, but potentially also the price of existing products (if any) that do not incorporate the innovation. Consumers are willing to pay the higher price because they value the additional attributes embodied in the new or improved product sufficiently to pay a premium for it over other firms’ products”⁹⁴.

It follows, that firms engaged in considerable research and development and other innovative activity may have low marginal costs but large fixed costs, which would lead them to price significantly above marginal costs in order to earn a competitive return in the long run. This might at first sight seem in contradiction with the static allocative efficiency concern for lower prices and will certainly deviate from the model of perfect competition. However, from a dynamic total welfare perspective, this sacrifice in static allocative efficiency may be compensated by the benefits flowing from dynamic efficiency: higher profitability for the undertakings and new or better quality products for the consumers in the long run.

Competition law in the United States and to a lesser extent in the EU requires evidence of consumer harm before finding a conduct restricting rivalry or competition on a relevant market to violate the competition law statutes. The concept of “consumer harm” may include multiple dimensions⁹⁵.

⁹⁴ Andrew Tepperman and Margaret Sanderson, ‘Innovation and Dynamic Efficiencies in Merger Review’ (Canada, Competition Bureau 2007), available at <http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/02378.html#key_concepts> pp. 6-7, accessed at 28 April 2013.

⁹⁵ Part of the analysis in the following paragraphs draws on Ioannis Lianos ‘Some Reflections on the Question of the Objectives of EU Competition Law’, *CLES Working Paper Series 3/2013* (2013), available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2235875>, accessed at 28 April 2013.

(i). In the economic jargon, the protection of consumer surplus constitutes an important part of the total welfare standard test. In this context, consumer surplus denotes the consumer part of the deadweight loss suffered as a result of the restriction of competition. For example, a price increase might lead to a volume effect that would be suffered by a certain category of consumers: because of the price increase some consumers will not be able to buy the product anymore, although past consumption patterns (revealed preferences) indicate that they would have preferred to do so, if the price had not increased. Under this narrow definition of consumer surplus, the overcharge paid by the consumers as a result of the price increase should not be of concern for competition law enforcement, as it constitutes a wealth transfer from the buyers to the sellers. The suppliers may be in a position to compensate (hypothetically, not actually) the loss that consumers have suffered while still being able to compensate with this wealth transfer their own losses following the volume effect (producer surplus). In this configuration the situation will be efficient. [the “consumer surplus standard”].

(ii). It is possible to decide that consumer surplus should be preserved at any cost and thus reject any compensation by the supplier that does not compensate actually and effectively the losses incurred by these consumers as a result of the volume effect [the “narrow consumer welfare standard”].

(iii). There is also an argument to move beyond consumer surplus and include in the analysis the wealth transfer that consumers have incurred because of the overcharges following the restriction of competition. These may not only relate to higher prices but could cover any other parameter of competition, such as quality, variety, innovation. In this case, both the loss of consumer surplus and wealth transfers will be compared to the total efficiency gains pertaining to the supplier(s), thus enabling a cost benefit analysis of the effect of the conduct on the welfare of a specific group of market actors, direct and indirect consumers (not all market actors). The idea is that following the change from an equilibrium situation to another, the consumers of the specific product will benefit from a surplus and/or wealth transfer, in the sense that their ability to satisfy their preferences will increase. [the “extended consumer welfare standard”].

(iv). Some authors also argue that competition authorities should aim to preserve an optimal level of “consumer choice”, defined as “the state of affairs where the consumer has the power to define his or her own wants and the ability to satisfy these wants at competitive prices”.⁹⁶ This concept seems broader than the concepts of “consumer surplus” and “consumer welfare” (the latter including consumer surplus + the wealth transfer because of the overcharge) as it may include other parameters than price, such as quality, variety and innovation. The same authors have used interchangeably the term of “consumer sovereignty”, which is defined as “the set of societal arrangements that causes that economy to act primarily in response to the aggregate signals of consumer demand, rather than in response to government directives or the preferences of individual businesses”.⁹⁷ Defining the “optimal degree” of consumer choice or consumer sovereignty and measuring it using some operational parameters seems however a

⁹⁶ Robert H Lande, ‘Consumer Choice as the Ultimate Goal of Antitrust’ (2001) 62(3) University of Pittsburgh Law Review 503, 503.

⁹⁷ Neil W Averitt and Robert H Lande (1997), ‘Consumer Sovereignty: A Unified Theory of Antitrust and Consumer Protection Law’ (1997) 65 Antitrust Law Journal 713, 715.

daunting task. Consumer sovereignty may be conceptually appealing but may prove empirically weak to implement in competition law enforcement. One might be obliged to go a step further and claim that consumer sovereignty can be preserved by the ability of consumers to influence the characteristics of the product bundle according to their own hypothetical revealed preferences. Hypothetical revealed preference theory defines an agent's preferences in terms of what she would choose if she were able to choose, thus switching from actual to hypothetical choice.⁹⁸ The way this theory will work in practice is still a matter of speculation. It is clear that consumers are influenced in their decisions by “the context of choice, defined by the set of options under consideration. In particular, the addition and removal of options from the offered set can influence people's preferences among options that were available all along”.⁹⁹ The firms with their marketing activities may, for example, shape endogenously consumer preferences by establishing an artificial selection process, “preferences are actually constructed—not merely revealed”.¹⁰⁰ A greater focus on consumer sovereignty may thus, in some cases, lead to more intensive competition law intervention to establish the parameters of independent consumer choice and specific presumptions against commercial practices that deny the sovereignty of consumer choice. Open and contestable markets are a prerequisite for the empowerment of consumers. The consumer choice or consumer sovereignty standard may also accommodate the psychological aspect of the formation of these preferences, which is usually ignored in neoclassical price theory. The integration of behavioural economics' evidence in order to understand the consumers' behaviour and build counterfactuals of hypothetical choice, based on predictions about what someone would choose in a specific choice context may also be one of the implications of this theory.

In competition law, the aim of protecting consumers implies that the outcome/consequences of a specific practice on consumers matters, before any decision on the lawfulness or unlawfulness of this practice has been reached. A reduction of competitive rivalry, following the exclusion of a competitor or an agreement between two competitors to cooperate with each other, will not be found unlawful, if they do not also lead to a likely consumer harm or consumer detriment. A different approach would take a deontological perspective emphasizing competitive rivalry (and the protection of the competitive process as such), irrespective of any actual or potential consequences of the specific practice/conduct on consumers. Effects may indicate empirical observable findings on the worsening, in terms of price or quality, of the situation of specific groups of consumers, following the adoption of the anticompetitive practice (actual effects). It may also refer to situations where there are no observable findings of effects on these groups of consumers but there is “a consistent theory of consumer harm” which is empirically validated: that is, “the theory of harm should be consistent with factual observations” (*ex ante* validation) and “that the market outcomes should be consistent with the predictions of the theory” (*ex post* validation).¹⁰¹ The theory of harm has the objective to establish a relation of causality between the specific practice and the consumer detriment. One could think in terms of a

⁹⁸ For a critical analysis see, Daniel M Hausman, *Preference, Value, Choice, and Welfare* (Cambridge University Press 2012) 31-33, citing as the main proponent of this theory Kenneth G Binmore, *Game Theory and the Social Contract: Playing Fair* (MIT Press 1994).

⁹⁹ Eldar Shafir, Itamar Simonson and Amos Tversky, ‘Reason-Based Choice’ (1993) 49 *Cognition* 11, 21.

¹⁰⁰ *Ibid* 34.

¹⁰¹ Penelope Papandropoulos, ‘Implementing an effects-based approach under Article 82’ (1998) *Concurrences* 1, 3.

probability-statement, that is, an evaluation of the “inferential soundness” of this relationship, or in terms of relative plausibility of the specific consumer harm story.

The operation of static and dynamic approaches in assessing the effect of a practice on consumers is trickier than when one adopts a total welfare standard, hence not focusing on a specific category of actors. Turning back to our previous discussion of the tension between static and dynamic efficiency, it is arguable that increasing R&D does not necessarily lead to socially optimal innovation, as firms might have an excessive incentive (relative to that which is socially optimal) to seek to replace other firms (“the business stealing effect”).¹⁰² As it is noted by the Canadian Bureau of Competition commissioned report on Innovation and Dynamic Efficiencies, “consumers do not derive benefits from an additional dollar of R&D spending unless that dollar results in an increased likelihood of either a new product being developed or an existing product being made available for a lower price”.¹⁰³ In other words, what is important is not to focus on R&D but on the innovation process and its outcomes. However, from a total welfare perspective, the cost to consumers of the increase of innovative activity is only one component of the analysis, the other being the profits that undertakings derive from the R&D activity long run. A change will thus be deemed efficient, even if there is over-investment on R&D, with regard to what is socially optimal, should the firm’s profitability increase as a result of this R&D effort, enabling it to potentially compensate the consumers’ loss.¹⁰⁴

An important issue that has been examined from time to time in the case law of the European Courts and the decisional practice of the European Commission is if competition law and policy is an objective of EU law or is it also a means to further other objectives of EU Law. Initially, competition law and policy has been conceived as a means to enhance the objective of establishing a common (Internal) market. This “outer” aim of competition policy might explain the teleological and extensive interpretation of the competition law provisions of the Treaty that the European courts have followed in a number of cases against private or public practices that raise barriers to trade and restrict competition.¹⁰⁵ The objective of market integration has influenced the Courts in the interpretation of the competition law provisions of the Treaty, also in its recent case law.¹⁰⁶

¹⁰² Tepperman and Sanderson (n 94) 8.

¹⁰³ Ibid 9.

¹⁰⁴ A total welfare approach could also look to the possible effects of innovation across markets, so not only the effects on suppliers and consumers present in the specific relevant market, hence performing some form of general equilibrium analysis. General equilibrium analysis focuses on the economy as a whole and studies economic changes in *all* the markets of an economy simultaneously.

¹⁰⁵ Cf: Case 56 & 58/64, *Consten & Grundig v Commission* [1966] ECR 299 applying Article 85 of the EC Treaty (now Art. 101 TFEU) to distribution practices establishing vertical restraints to competition.

¹⁰⁶ Cf: Joined Cases C-501/06 P, C-513/06 P, C-515/06 P and C-519/06 P *GlaxoSmithKline Services Unlimited v Commission* [2009] ECR I-929 (finding that a dual pricing system restricting the opportunities of parallel trade constituted a restriction of competition by its object under Article 101 TFEU); See also, Joined Cases C-468/06 to 478/06, *Sot. Lelos kai Sia v GlaxoSmithKline* [2008] ECR (where the Court examined the compatibility to Article 102 TFEU of a refusal to supply wholesalers engaging in parallel exports. The Court implicitly recognized that certain types of conduct, such as a restriction of parallel trade are presumptively anticompetitive, because they frustrate the objective of the Treaty to achieve the integration of national markets through the establishment of a single market); Case 13/77, *INNO / ATAB* (1977) ECR 2115 (extending the application of the competition law provisions of the Treaty to state restrictions of competition).

B. The intersection between competition law and intellectual property: principles

1. The thesis of a “unified field” and the persistence of conflicts

Even if one adopts the view that intellectual property law and competition law pursue the common and sole objective of economic welfare, there may still be instances of conflict between the two. This mainly occurs in situations of cumulative innovation or when IP is used strategically in order to exclude competitors and harm consumers.

a. Competition law, IP rights and the common objective of economic welfare

By granting an exclusive right, intellectual property offers the opportunity to the right holder to earn extra profits. The consumers of the particular good embodying the IP right will consequently lose because the level of output of the particular good will be lower than would have been the case in the absence of an exclusive right. The tension between intellectual property and competition policy will be even more significant if the objective of the latter is also to maximise consumer welfare by limiting money transfers from the consumers to the IP rights holder. However, if the IP owner did not have the opportunity to overprice his product, there would be suboptimal incentives to commit resources to investment at the first place. In the absence of intellectual property rights, the product would simply not exist and the consumers would benefit from less innovation.

It is not clear what the term “innovation” covers but we will define it broadly as referring to an “economic change” or development that is not generated by the spontaneous evolution of consumers’ needs but is instead engendered by the producers. This covers, according to economist Joseph Schumpeter the following five cases:

“(1) the introduction of a new good – that is one with which consumers are not yet familiar – or of a new quality of a good. (2) The introduction of a new method of production, that is one not yet tested by experience in the branch of manufacture concerned, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially. (3) The opening of a new market that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before. (4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created. (5) The carrying out of the new organization of any industry [...]”¹⁰⁷

Not all type of innovation should, however, be protected by intellectual property rights on this analysis; only those whose value to the consumers is more important than the cost of the IP protection.

¹⁰⁷ Schumpeter (n 6) 66. ‘The European Commission seems also to adopt this broad definition of “innovation” in its 1995 ‘Green Paper on Innovation’ COM(1995) 688 final (The Commission defined innovation as “the renewal and enlargement of the range of products and services and associated markets; the establishment of new methods of production, supply and distribution; the introduction in changes in management, work organization and the working conditions and skills of workforce”).

It is therefore important to balance the respective effects of competition law and intellectual property on consumer welfare. The trade-off between the long-term effects of IP rights on incentives to innovate and their short-term effects on output and prices is not however an easy task. Indeed, in theory, intellectual property law focuses more on the long-term effects, while competition law's focal point is primarily on the short-term effects of a business practice to "consumer welfare".

This is not to argue that competition law ignores the long-term effects brought by greater innovation to economic welfare.¹⁰⁸ The European Commission's *Guidelines on the application of article 81(3) of the Treaty* examine the effects of a particular agreement on innovation¹⁰⁹ while they also integrate dynamic efficiencies as possible compensating factors of an otherwise anticompetitive agreement, which restricts output and increases prices.¹¹⁰ The "balancing test" that the Commission applies aims to ensure that these "qualitative efficiencies", such as new and improved products, will create "sufficient value for consumers to compensate for the anti-competitive effects of the agreement, including a price increase".¹¹¹ This is because the availability of new and improved products constitutes an important source of benefits to consumers.¹¹² However, the assessment of pro and anti-competitive effects is an arduous task as it is difficult to assign precise values to dynamic efficiencies in order to conduct a cost benefit analysis and assess the effects of a practice to "consumer welfare".¹¹³

What are the implications of a strong intellectual property protection to total and consumer welfare? By offering the possibility to the IP holder to increase prices, IP rights may decrease output and therefore total welfare. However the dynamic efficiencies brought by IP may largely compensate the losses. The effect of IP to consumer welfare is a more complicated issue and depends on the extent the "monopolistic" profits generated by the exclusive right of the IP holder will be passed on to the consumers in one way or another. This will not necessarily take the form of lower prices, but also of better quality, new products or services and extended consumer choice.

b. Intellectual property, competition and cumulative innovation

A system of strong IP protection may nevertheless harm consumers in the long run by restricting cumulative innovation. This situation raises two issues: the importance of cumulative innovation to economic welfare and the relation between innovation and market structure, as it is

¹⁰⁸ See Commission Notice- *Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements*, [2004] OJ C 101/2, ("both bodies of law share the same basic objective of promoting consumer welfare and an efficient allocation of resources. Innovation constitutes an essential and dynamic component of an open and competitive market economy. Intellectual property rights promote dynamic competition by encouraging undertakings to invest in developing new or improved products and processes. So does competition by putting pressure on undertakings to innovate. Therefore, both intellectual property rights and competition are necessary to promote innovation and ensure a competitive exploitation thereof").

¹⁰⁹ *Guidelines on the application of article 81(3) of the Treaty* [2004] OJ C101/97, paras 24 to 25.

¹¹⁰ Ibid para 70.

¹¹¹ Ibid para 102.

¹¹² Ibid para 104.

¹¹³ Ibid para 103.

not necessarily true that a competitive structure will generate more innovation than a more concentrated one.

As we have previously explained, one can distinguish between two types of innovation: “stand alone innovation”, which refers to the situation where the IP right will not be used as an input to another innovation, and “cumulative innovation”, which refers to the situation of successive innovations built upon earlier innovations. It is widely accepted that cumulative innovation substantially increases social value. Public authorities recognise this reality by establishing innovation clusters, such as the Silicon Valley in the United States, which provide the possibility for information exchange and the development of research synergies.¹¹⁴

Cumulative innovation may take different varieties: either the second innovation could not be invented without the first, or the first innovation reduces the cost of achieving the second, or finally the first innovation accelerates the development of the second by providing new research tools.¹¹⁵ The social value of the innovation process is, in each of these forms, unequally distributed between the first and the second innovator. It will be important to find the right incentive mechanism in order to ensure that earlier innovators are compensated adequately for establishing the foundations for later innovators, while also making sure that cumulative innovators still have an incentive to invest. The original design of intellectual property rights should therefore take into account the need to compensate both the initial and the subsequent innovators.

It is however impossible in practice to consider *ex ante* all the possibilities of cumulative innovation in designing the initial intellectual property rights. By definition, cumulative innovations did not exist the time the IP rights were granted to the initial innovator. Confronted with demands of subsequent innovators to use the first-generation innovation, the IP holders face a strategic choice: either they will encourage cumulative innovation or they will refuse to license their inventions and therefore block innovation. They may have an interest in refusing only if the cumulative innovator may be in a position to compete with them in the market of the second-generation product or in the market of the first-generation product covered by the IP right. This will indirectly affect consumers as, in the absence of cumulative innovation, they will not benefit from new products and services. However, by refusing to license the IP rights, holders of the first-generation product incur the risk that their rivals will develop in the future a competing technology, which will provide an alternative to the first-generation innovation.

It should also be noted that the initial design of intellectual property rights will also affect the bargaining position of the parties to the licensing agreement. Usually the IP right holder will not have any interest in refusing to license. There is an important body of literature explaining that in high technology sectors, competitors usually share information by publishing their research and do not systematically have recourse to intellectual property protection in order to

¹¹⁴ For an analysis of the Silicon Valley model in product system development, see Masahiko Aoki, *Towards a Comparative Institutional Analysis* (The MIT Press 2001) 347.

¹¹⁵ Suzanne Scotchmer ‘Standing on the Shoulders of Giants: Protecting Cumulative Innovators’ in Suzanne Scotchmer, *Innovation and Incentives* (MIT Press 2005) at p. 139.

appropriate part of the social value created by cumulative innovation.¹¹⁶ The revenues that an initial inventor can derive from cumulative innovation via licensing are considerable.

Nevertheless, the private interest of the IP right holder will not always coincide with the goal of promoting cumulative innovation. In such circumstances, it may be expected that the IP right owners would likely decide to exclude competition. The simple fact that the refusal to license will make possible the exclusion of rivals from the market is not enough to infer a competition law infringement. It is also important to plausibly claim a theory of anticompetitive effects.

c. Exclusionary theories of anticompetitive effects and intellectual property rights

Economists have advanced a number of theories of anticompetitive effects explaining why even a unilateral practice may raise competition law concerns. Even if these theories apply to different settings, it is submitted that the anticompetitive effects may be reinforced in the presence of IP rights, if the later are used strategically in order to control a network and as a result restrict competition and innovation. We focus here on practices that produce anticompetitive effects and consumer harm by excluding competitors, as both US antitrust law and EU competition law apply to these practices. Some legal systems (such as EU competition law) also apply to practices that produce directly consumer harm, without the exclusion of a competitor (e.g. excessive prices, price discrimination), the so-called exploitative abuses.

(i) The leverage theory

One of the most controversial doctrines of anticompetitive effects is the leverage theory, which explains that, by refusing to license, the monopolists seek to extend their monopoly power to a downstream related market.¹¹⁷ This theory was criticised by the Chicago school of antitrust economics, which argues that an upstream monopolist has no interest in leveraging its monopoly power to a related market because it is possible to gain only one monopoly profit overall (single monopoly profit theorem).¹¹⁸ As a result, the leverage theory lost its appeal as an autonomous basis for action, in the United States,¹¹⁹ although it still retains some significance in Europe.¹²⁰

The economic grounding of the theory has nevertheless been revisited lately. Whinston criticised the assumptions of the Chicago school and argued that, in certain circumstances, a monopolist in a market A may follow a leveraging strategy by using tying practices as a commitment device in order to signal to its actual or potential competitors in the downstream market B that they will face aggressive competitive behaviour, which will eventually decrease their profits.¹²¹ The potential rivals will thus be less inclined to enter the market or be excluded

¹¹⁶ Yochai Benkler, 'Coase's Penguin, or, Linux and the Nature of the Firm' (2002) 112 Yale Law Journal 369.

¹¹⁷ Louis Kaplow, 'Extension of Monopoly Power Through Leverage' (1985) 85 Columbia Law Review 515.

¹¹⁸ Ward Bowman 'Tying Arrangements and the Leverage Problem' (1957) 67 Yale Law Journal 19; Richard Posner, *Antitrust Law* (University of Chicago Press 2001) 198-200.

¹¹⁹ *Verizon Communications, Inc. v Law Offices of Curtis V. Trinko, LLP*, 540 US 398 (Trinko case).

¹²⁰ Case T-201/04 *Microsoft v Commission* [2007] ECR II-3601

¹²¹ Michael D Whinston, 'Tying, Foreclosure and Exclusion' (1990) 80 American Economic Review 837.

from it, if they were present. This strategy is profitable if the tied goods are complements in fixed proportions to the goods in market A.

Choi and Stefanadis also developed a model in which the incumbent firm may have the interest to extend its monopoly from one market to another if the two products are complements and the new entrant can effectively enter the market for one of the two product only if it has successfully innovated in both markets.¹²² The cumulative innovators would therefore be prevented from capturing the social value of their innovation in one market before they also innovate in the second market. This will decrease their incentives to engage in innovation at the first place with the result that the dominant firm's strategy will pre-empt the emergence of cumulative innovation.

(ii) The essential facilities doctrine

The essential facilities doctrine is inspired by the leverage theory but presents certain specific characteristics. It is a legal doctrine framed by some early US decisions, which held that under specific circumstances, firms have affirmative duties to assist their competitors.¹²³ Although never explicitly accepted by the US Supreme Court, the lower courts have set the conditions for the application of the doctrine as requiring from the plaintiff proof of the following four elements: (1) control of the essential facility by a monopolist; (2) a competitor's inability practically or reasonably to duplicate the essential facility; (3) the denial of the use of the facility by a competitor; (4) the feasibility of providing the facility.¹²⁴ The Supreme Court has recently marginalised the doctrine of essential facilities and it seems that the use of the doctrine of essential facilities in US law has fallen in desuetude.¹²⁵ Because the monopolist controls an essential facility (sometimes called bottleneck) he may be able to extend his monopoly power from "one stage of production to another".¹²⁶ Under the essential facilities doctrine, a vertically integrated monopolist will be required to share some input in a vertically related market with someone operating downstream. This will only be the case if it is feasible for the monopolist to provide the facility, the competitor would be reasonably and practically unable to duplicate it and the denial of the use of the facility will deprive the competitor of an essential input, thus enabling the dominant firm to extend its monopoly power in a related market. In EU competition law, the

¹²² Jay P Choi, 'Preemptive R&D, Rent Dissipation and the 'Leverage Theory' (1996) 110 Quarterly Journal of Economics 1153; Jay P Choi and C. Stefanadis 'Tying, Investment, and the Dynamic Leverage Theory' (2001) 32 Rand Journal of Economics 52.

¹²³ *United States v Terminal R.R. Ass'n*, 224 US 383 (1912); *Associated Press v United States*, 326 US 1 (1945); *Otter Tail Power Co. v United States*, 410 US 366 (1973) (although the US Supreme Court never accepted explicitly the theory).

¹²⁴ *MCI Communications Corp. v AT&T*, 708 F.2d 1081, 1132-1133 (7th Cir. 1983) (MCI case)

¹²⁵ See for instance the position of the Supreme Court in *Trinko* case (n 119). The Court noted that there are several problems with imposing a duty to deal and with regard to the essential facilities doctrine, it found "no need either to recognize it here or to repudiate it here", noting that the doctrine applies if access is unavailable. That was not the case as the 1996 Telecommunications Act already mandated access. Some lower courts have nevertheless continued to apply the *essential facilities doctrine* after the *Trinko* decision.

¹²⁶ MCI case (n 124).

Commission first used the concept of “essential facilities” in some decisions on interim measures involving the opening of port facilities to competition.¹²⁷

An essential facility is taken as a facility to which access is essential for the provision of goods or services in a related market and where it is not economically efficient or feasible for a new entrant to replicate the facility. The concept has extended beyond infrastructure (railways, including track and stations; airports, including slot allocation; ground handling services; utility distribution networks e.g. electricity wires and gas pipelines; bus stations; ports) to airline computer reservations systems and in some cases intellectual property rights. There is some debate over the practical use of this doctrine and its added value in view of the quite interventionist approach of competition authorities and courts in Europe with regard to imposing a duty to deal, in comparison to the United States. Some authors have gone as far as analyzing all the case law of the European Courts on unilateral refusals to deal from the prism of the essential facilities doctrine.¹²⁸

Contrary to the traditional leverage theory, the essential facilities doctrine has a structural and not a behavioural component, in the sense that “a monopolist’s status (as the owner of the facility and a competitor in the market that relies on the facility) rather than any affirmative conduct determines liability”.¹²⁹ The application of the essential facilities doctrine has been extended to a wide variety of “facilities” owned or controlled by a monopolist. Commentators seem however to increasingly question the utility of the essential facilities doctrine as a valid basis for antitrust liability¹³⁰ and recent case law in the United States has placed important limitations on its use.¹³¹ The doctrine continues nonetheless to retain some significance in Europe.¹³²

(iii) Raising rivals’ costs

A distinct theory of anticompetitive effects is that dominant firms may use IP rights to create barriers to entry and raise the costs of their rivals.¹³³ As a result they will be able to increase profitably their prices, up to the level of their rivals and exercise market power, or to profitably undercut rivals’ prices and drive them out of the market. IP rights may facilitate strategies of raising rival costs if the technology covered by the IP right is a valuable input.

¹²⁷ *Sea Containers v Stena Sealink* [1994] OJ L15/8; See also *B&I Line plc v Sealink Harbours Ltd and Sealink Stena Ltd* [1992] CMLR 255.

¹²⁸ See, John Temple Lang, ‘Defining Legitimate Competition: Companies’ Duties to Supply Competitors, and Access to Essential Facilities’ (1994) 18(2) *Fordham International Law Journal* 437.

¹²⁹ Herbert J Hovenkamp, Mark D Janis and Mark A Lemley, ‘Unilateral Refusals to License in the US’ in François Lévêque and Howard Shelanski (eds), *Antitrust, Patents and Copyright - EU and US Perspectives* (Edward Elgar, 2005) 12 and 18.

¹³⁰ See Abbott B Lipsky and Gregory J Sidak ‘Essential Facilities’ (1999) 51 *Stanford Law Review* 1187, 1191-1192.

¹³¹ Herbert J Hovenkamp, *Federal Antitrust Policy* (3rd ed, Thomson/West 2005) 309-314.

¹³² Case C-7/97 *Oscar Bronner GmbH & Co KG v Mediaprint Zeitungs- und Zeitschriftenverlag GmbH & Co KG* [1998] ECR I-7791.

¹³³ Thomas G Krattenmaker and Steven C Salop ‘Anticompetitive Exclusion: Raising Rivals’ Costs to Achieve Power Over Price’ (1986) 96 *Yale Law Journal* 209.

Rubinfeld and Maness underscore that IP owners may use their IP portfolio strategically to raise their rivals' costs by creating a "patent thicket", which includes patents whose validity is questionable ("submarine patents"), or by adopting a strategy of "patent flooding", in which "a firm files a multitude of patent applications that claim minor variations on a competitor's existing technology".¹³⁴ These strategies will have the advantage, according to the same authors, to "require little or no short-run profit sacrifice to achieve the desired long-term goal of lessening competition in the marketplace".¹³⁵ They may nonetheless achieve a number of anticompetitive effects, such as foreclosure, predatory pricing and tacit collusion. Indeed, competitors will face a difficult choice: either they will have to litigate the validity of the patents, or they will have to accept a license and pay the fee, or finally they will have to design their products "around the patent".¹³⁶ All these practices will increase their costs, reduce their incentives to innovate and facilitate collusive practices as, in most cases, the dispute will lead to an anticompetitive patent settlement¹³⁷ or a cross-licensing scheme.¹³⁸ The IP owners could also offer a predetermined bundle of licenses to their competitors (package licensing), even if the later do not need the whole package. This will have the effect of limiting their rivals' choice and reducing their incentives to innovate, thus restraining competition in the final goods market.

(iv) Maintenance to monopoly

The theories of anticompetitive effects set out in this section relate to strategies that erode the competitive advantage of the monopolist's rivals in a related market with the aim to extend the monopolist's market power in that related secondary market. An alternative claim of anticompetitive effect is that the dominant firm will seek to maintain its monopoly power on the primary market of the technology covered by the IP right. This maintenance of monopoly claim will usually be integrated in a sequential innovation scheme.¹³⁹

Carlton and Perloff give the example of a two-period setting with a firm that operates in a primary market and a market for a complementary good. Under this example, due to a patent, the firm has, in a first period, a dominant position in the primary market. However, in a second period, the incumbent monopolist faces the risk of entry of an alternative producer into the primary market. According to their model, although the alternative producer has a superior complementary product in both periods, his primary product is of equivalent quality only in the second period.

¹³⁴ Daniel L Rubinfeld and Robert Maness 'The Strategic Use of Patents: Implications for Antitrust' in Lévêque and Shelanski (eds) (n 129) 85.

¹³⁵ Ibid 87.

¹³⁶ Ibid 97.

¹³⁷ Herbert Hovenkamp, Mark D Janis and Mark A Lemley 'Anticompetitive Settlement of Intellectual Property Disputes' (2003) 87 Minnesota Law Review 1719.

¹³⁸ Cross-licensing may also have anticompetitive effects: Adam B Jaffe and Josh Lerner, *Innovation and Its Discontents: How the Broken Patent System is Endangering Innovation and Process, and What to Do About it* (Princeton University Press 2004) 60.

¹³⁹ Dennis W Carlton and Michael Waldman 'The Strategic Use of Tying to Preserve and Create market Power in Evolving Industries' (2002) 33 Rand Journal of Economics 194; Choi and Stefanadis (n 122).

The strategy of the alternative producer will be to use the profits earned by selling units in the complementary market to cover its fixed costs of entering the primary market. The incumbent monopolist can react by increasing the costs of entry of his rivals in the complementary market. He will achieve this goal by tying the primary product with the complementary product. As a result, the entry of the alternative producer in the primary market at the second period will be deterred. It is not the objective of the strategy to extend monopoly power in the market of the complementary good but simply to preserve market power in the primary product covered by the IP right. Consequently, less innovation will happen in both the primary and complementary products markets.

These different models suggest that, in certain circumstances, IP rights holders will have the interest to deter dynamic innovation that could render obsolete their technological standard.¹⁴⁰ This situation is exacerbated in a network setting, as the IP rights holders will have more incentives to engage in predatory practices in order to control the standard of the network.¹⁴¹ By doing so, they will not only be able to recoup their investments but also capture the full value of the network. Indeed, the value of a network increases as it grows larger and more firms participate in it. The IP holder will therefore be able to capture value that has been created by the other participants to the network. The objective of IP rights should be to compensate the inventive effort of the IP holder and not to confer a windfall profit.

These anti-competitive effects can only be produced if the IP holder has a monopoly power. This is an important issue as the main objective for granting IP rights is to confer to the IP holder the ability to raise prices. On the contrary, competition law constraints the use of monopoly power.

2. The focus on static allocative efficiency analysis in competition law

a. IP rights are not monopolies¹⁴²

The history of IP rights highlights the fact that their conception as a form of “property right” is a recent evolution.¹⁴³ One could mention the example of patents, which were initially considered as monopoly privileges granted by the sovereign to supporters and favourites as a reward for their loyalty.¹⁴⁴ The excesses of these unjustified grants of privilege led to an increasing unrest of the courts and the legislature, which sought to create boundaries for these exercises of “royal prerogative”.

¹⁴⁰ Dennis W Carlton and Robert H Gertner ‘Intellectual Property, Antitrust and Strategic Behavior’ NBER Working Paper Series, Working paper 8976, available at < <http://www.nber.org/papers/w8976> > last accessed 28 April 2013.

¹⁴¹ Herbert J Hovenkamp, *The Antitrust Enterprise—Principle and Execution* (Harvard University Press 2005) 277-304.

¹⁴² For a more extensive analysis, see Ioannis Lianos ‘Competition Law and Intellectual Property Rights: Is the Property Rights’ Approach Right?’ in John Bell and Claire Kilpatrick (eds) 8 *The Cambridge Yearbook of European Legal Studies* (Hart Publishing 2006) 153.

¹⁴³ Boudewijn Bouckaert, ‘What is Property?’ (1990) 13 *Harvard Journal of Law and Public Policy* 775.

¹⁴⁴ Christopher May and Susan K Sell, *Intellectual Property Rights – A Critical History* (Lynne Reiner 2006).

In the case *Darcy v Allein*, decided in 1602,¹⁴⁵ the Kings Bench applying the restraints of trade doctrine, considered that the grant of an exclusive privilege damages everyone who wants to use the product because the monopolist will raise the price and reduce the quality of the goods and “deprive other workmen of a living”.¹⁴⁶ However, the court rendered an exception from the prohibition limited-term patents. This rule was codified by the Statute of Monopolies in 1623, which declared void all monopolies but explicitly excepted from the prohibition, patents granted to the first inventor or inventors of new manufactures, if these were not “contrary to the law, nor mischievous to the state, by raising prices of commodities at home, or hurt of trade, or generally inconvenient”.

The collision between the restraints of trade doctrine (being for these purposes an early antecedent of competition law) and what could be considered as the initial steps of patent law has been resolved in recognising the limited circumstances in which patent monopoly grants could be upheld. It is interesting to note that the word “property” was not used and that intellectual property rights were referred to as “privileges”. Patents were also to be considered void any time they raised the price of commodities “at home”. Their creation was purely motivated by mercantilist reasons (enhance technological progress and export trade) and their negative effects on prices strictly limited to foreign trade and consumers.

The use of the term “property” came later when it became clear that there should be some kind of natural rights justification for maintaining this kind of monopoly privilege in the period of laissez-faire that followed the mercantilist era. The evolution of the “monopoly” concept has nevertheless limited the risks of conflict between competition law and intellectual property. As a result it has enfeebled the rationale of the “property rights” rhetoric.

The use of the term “property” does not necessarily confer an absolute antitrust immunity.¹⁴⁷ One of the attributes of property rights is exclusivity. Exclusivity means that the owner of the property has the right to exclude others from exercising his rights of use without permission. The right to exclude was also the cornerstone of the legal conception of “monopoly”, before the consolidation of the more economic concept of market power. Indeed, during the most active period of antitrust enforcement that started in United States in the 1930s and also even prior to that, the legal definition of what constituted “monopoly” was still predominant and diverged from the definition of this term by economists.¹⁴⁸ This period also marks the ascendancy of the competition logic after a period of peaceful co-existence between intellectual property rights and antitrust.

If monopoly is considered as a synonym for exclusive right, then by definition the owner of a patent is a monopolist. But if the meaning of monopoly is the condition that generates social loss, in economics this condition is only present “when the demand curve has a negative slope in the region at which output is occurring”.¹⁴⁹ This is not always the case for intellectual property

¹⁴⁵ *Darcy v Allen* (The Case of Monopolies) (1602), Moore (K.B.) 671.; 77 Eng. Rep. 1260.

¹⁴⁶ Michael J Trebilcock, *The Common Law of Restraint of Trade* (Sweet & Maxwell 1986).

¹⁴⁷ Rudolph J Peritz, ‘The “Rule of Reason” in Antitrust Law: Property Logic in Restraint of Competition’ (1989) 40 *Hastings Law Journal* 285, 336.

¹⁴⁸ Edward S Mason, ‘Monopoly in Law and Economics’ (1937) 47 *Yale Law Journal* 34.

¹⁴⁹ Edmund W Kitch, ‘Patents: Monopolies or Property Rights?’ (1986) 8 *Research in Law and Economics* 31, 33.

rights, as there may be substitute products or technologies, which are not covered by the property rights and could be used instead by the consumers.¹⁵⁰ The owners of the intellectual property rights are therefore limited in their capacity to charge a monopoly price as they should also take into account the competitive pressures exercised by competing products or technologies.

One could also compare the situation with a monopolistic competition equilibrium following some product differentiation. Consequently, terminology can be seen to have an important significance.¹⁵¹ In this context, the use of the concept of economic rents is a more suitable terminology than the concept of “monopoly” because it highlights the fact that the patent holder benefits from a cost advantage that allows him to make more profits than his rivals but the patent does not necessarily confer him the possibility to restrict output and therefore exercise monopoly power.¹⁵²

The presumption that an intellectual property right may confer monopoly power has been weakened and ultimately abandoned in both US antitrust law¹⁵³ and EU competition law.¹⁵⁴ Although there is no presumption that IP rights confer market power, they may however reinforce in EU competition law the inference of a dominant position if the undertaking also enjoys a high market share.¹⁵⁵

b. The property rights character of IP rights should not provide competition law immunity

One of the side-effects of the conflict between competition law and intellectual property rights is the need to find theoretical justifications for instituting property rights in ideas. It is not the first time that intellectual property is placed in a defensive position. The “literary property” debate of the 18th century and the “patent controversy” of the 19th century, highlighting the collision of copyright and patents with the common law and the principle of free trade, engendered an important debate on the theoretical underpinnings of intellectual property.¹⁵⁶ From these beginnings, it is clear that the narrative of property that appeared in both periods played an “*ex post facto*” role in legitimating the granting of property rights in ideas. It also served as a useful organising concept for all the different forms of IP rights that have emerged. In more recent times, the adoption of international treaties on intellectual property, within the WTO

¹⁵⁰ Roger E Meiners and Robert J Staaf, ‘Patents, Copyrights, and Trademarks: Property or Monopoly?’ (1990) 13 Harvard Journal of Law and Public Policy 911; Edmund W Kitch, ‘Elementary and Persistent Errors in the Economic Analysis of Intellectual Property’ (2000) 53 Vanderbilt Law Review 1727, 1734.

¹⁵¹ Hillary Greene, ‘Afterword: The Role of the Competition Community in the Patent Law Discourse’ (2002) 69 Antitrust Law Journal 841, 844.

¹⁵² Dam (n 7) 250-251. The ability to raise prices profitably and restrict output is also a prerequisite for finding an “exclusionary market power” in situations of raising rivals’ costs strategies.

¹⁵³ *Illinois Tool Works Inc. v Independent Ink Inc.*, 547 US (2006). The Supreme Court abandoned the presumption that a patent confers market power upon the patentee.

¹⁵⁴ Case 78/70 *Deutsche Grammophon Gesellschaft mbH v Metro-SB-Grossmarkete GmbH & Co.*, [1971] ECR 487, para 16. ; Joined Cases C-241/91 and C-242/91 *Radio Telefis Eireann v Commission (Magill)*, ECR [1995] I-743, para 46.

¹⁵⁵ See, Case 85/76 *Hoffmann-La-Roche v. Commission* [1979] ECR 461, para 42D & 48; Case T-51/89, *Tetra Pak Rausing S.A. v Commission* [1990] ECR II-309, para 23.

¹⁵⁶ On the “literary controversy” see, May and Sell (n 144) 87-97; Sherman and Bently (n 7) 11. On the “patent controversy” see Fritz Machlup and Edith Penrose, ‘The Patent Controversy in the Nineteenth Century’ (1950) 10 Journal of Economic History 1.

or the WIPO, has strengthened the importance of IP rights while at the same time restricted governments' discretion to actively apply their competition law statutes.¹⁵⁷

From this perspective, considered as a form of property, IP rights benefit from a high level of esteem and legal protection that could lead to a weak application or even immunity from competition law enforcement. Property rights are of constitutional value. They are generally protected by the Constitutions of the European Union Member States and by the first additional Protocol of the European Convention of Human rights (ECHR), which is also integrated in European Union law. The rhetoric of "property rights" therefore plays an important role in legitimating IP rights and in defining a framework for the interface between intellectual property and competition, which is largely biased in favour of IP rights. US law is somewhat different. The Constitution gives Congress the authority to create patent and copyright rights, however, there is no requirement that it do so.¹⁵⁸ However, once a patent or copyright is awarded, it is treated like property.

There are an increasing number of references, in competition law discourse, to the need to establish an analogy between physical property rights and intellectual property. Take for example the US Guidelines for Intellectual Property of 1995 which provide that:

"(t)he Agencies apply the same general antitrust principles to conduct involving intellectual property that they apply to conduct involving any other form of tangible or intangible property".

The European Commission also mentioned in the *Microsoft* decision that IP rights are "not in a different category to property rights as such". In addition, article 17 of the Charter of Fundamental Rights of the European Union, which has since the Lisbon Treaty legal-binding effect, proclaims the right to property, which is based on Article 1 of the Protocol to the ECHR.¹⁵⁹ The guarantee laid down in subsection 1 of article 17 applies also to IP, mentioned in subsection 2, which emphasizes the analogy drawn between property rights in goods and property rights in ideas. One could remark that the term "rights" is not used for intellectual property, while this is the case for property. However, nothing is mentioned in the second paragraph concerning the possible public interest limits to the scope of intellectual property protection.

It remains however clear that property does not constitute an absolute right. European Union law emphasises the "social function" of property, according to which, property rights can be restricted for reasons of public interest, provided that those restrictions in fact "do not constitute, as regards the aim pursued, a disproportionate and intolerable interference which

¹⁵⁷ See article 31 of the TRIPS agreement. Hanns Ullrich, 'Expansionist Intellectual Property Protection and Reductionist Competition Rules: a TRIPS Perspective' in Keith Maskus (ed), *International Public Goods and Transfer of Technology* (Cambridge University Press 2005) 726-757.

¹⁵⁸ US Const. Art. 1, § 8.

¹⁵⁹ According to article 17 of the Charter, "1. Everyone has the right to own, use, dispose of and bequeath his or her lawfully acquired possessions. No one may be deprived of his or her possessions, except in the public interest and in the cases and under the conditions provided for by law, subject to fair compensation being paid in good time for their loss. The use of property may be regulated by law insofar as is necessary for the general interest. 2. Intellectual property shall be protected."

infringes upon the very substance of the rights thus guaranteed”.¹⁶⁰ Competition law constitutes a “general interest” objective that could justify a restriction on the scope of property rights.¹⁶¹ The terminology of “property rights” does not create an antitrust immunity for IP rights, as their use can be restricted any time they contribute to an infringement of competition law and act against the public interest.

At the same time as being powerless in providing an immunity status to IP rights, the “property rights” rhetoric also does not contribute to the understanding of the necessity of balancing the objectives of reward and dissemination. Indeed, the criterion of “property” is formalistic and does not provide any useful information as to the adequate level of reward and dissemination in order for the scope of the IP right to be optimal.¹⁶² This is clear from proponents of a strong IP protection not referring to the concept of “property right”, when attempting to emphasise the instrumental character of intellectual property in order to achieve greater innovation and economic welfare. On the contrary, economists fully adhere to the instrumental approach to property rights and consider property rights as a form of collective action in the marketplace along with other tools such as direct regulation, liabilities, rewards and taxes.¹⁶³

The parallel drawn with physical property is consequently not helpful in determining the adequate balance between reward and dissemination. It is remarkable that both those favouring a less activist antitrust policy against IP rights and those advocating a more careful consideration of the effects of intellectual property protection to competition adhere to the “property rights” logic of intellectual property, while supporting opposite conclusions.¹⁶⁴

We consider that the analogy with property rights on tangibles is misleading¹⁶⁵. First, IP rights have distinct characteristics not present in physical property rights. Information may be considered as a pure public good as the “consumption” of information by one person does not diminish the possibility of its consumption by another. Simultaneous (or joint) consumption is also possible. The necessity to confer property rights in order to avoid congestion externalities,

¹⁶⁰ Case 265/87 *Herman Schröder HS Kraftfutter GmbH v Hauptzollamt Gronau* [1989] ECR 2237, para 15.

¹⁶¹ *FAG-Flughafen Frankfurt/Main AG*, 98/190, OJ [1998] L 72/30, para 90. This is also a conclusion reached by the advocate general George Cosmas in Case C-344/98 *Masterfoods Ltd. v HB Ice Cream Ltd.* [2000] ECR I-11369.

¹⁶² Steve Anderman, ‘Does the Microsoft Case offer a New Paradigm for the Exceptional Circumstances Test and Compulsory Copyright Licenses under EC Competition Law?’ (2004) *Competition Law Review* 7, 22.

¹⁶³ Steven Shavell, *Foundations of Economic Analysis of Law* (Belknap Press of Harvard Univ. Press 2004) 93-94; See also Richard Posner, *Economic Analysis of Law* (6th ed, Aspen 2003) 47 (distinguishing between “formal property rights” and the way economists describe them as “every device – public or private, common law or regulatory, contractual or governmental, formal or informal – by which divergences between private and social costs or benefits are reduced”); James E Krier ‘The (Unlikely) Death of Property’ (1990) 13 *Harvard Journal of Law and Public Policy* 75, 76 and 78 (“(regulation and property) are simply variations in a more general category of operational techniques. Property is just a system of regulation and vice versa”).

¹⁶⁴ Comp. Cyril Ritter, ‘Refusal to Deal and Essential Facilities: Does Intellectual Property Require Special Deference Compared to Tangible Property?’ (2005) 28 *World Competition* 281; Simon Gevenaz, ‘Against Immunity for Unilateral Refusals to Deal in Intellectual Property: Why Antitrust Law Should Not Distinguish Between IP and Other Property Rights’ (2004) 19 *Berkeley Technology Law Journal* 741 who take a more activist antitrust standpoint with Christian Ahlborn, David S Evans and Jorge A Padilla ‘The Logic & Limits of the “Exceptional Circumstances Test” in Magill and IMS Health’ (2004) 28 *Fordham International Law Journal* 1109.

¹⁶⁵ See, Ioannis Lianos, ‘Competition Law and Intellectual Property Rights: Is the Property Rights’ Approach Right?’ in John Bell and Claire Kilpatrick (eds) 8 *The Cambridge Yearbook of European Legal Studies* (Hart Publishing 2006) 153.

which is the usual rationale for physical property rights, is not therefore compelling.¹⁶⁶ The overuse of the information by free riders may nevertheless decrease the value of the resource for the inventors who will find it more difficult to recoup their fixed costs. As a result, their incentives to innovate will diminish and the level of provision of this good would be below the socially efficient level.¹⁶⁷ Granting a property right on information requires a trade-off between the need to encourage innovation and the adequate dissemination of the innovation.¹⁶⁸ This is an important difference with physical property rights and highlights the inherent instrumental character of intellectual property. Second, the intervention of the public authorities is also more systematic and intensive for IP rights than for tangible property rights.¹⁶⁹ For example, the examination of the conditions of patentability is done by a specialised regulator, the Patent Office. This highlights the most important difference between intellectual property rights and property rights on tangibles: the intervention of an independent regulatory agency. By considering that certain intellectual property rights such as patents are not common law rights but simple creations of an administrative process, it is possible to argue that they should not benefit from the thesis of the efficiency of common law and that they can be the outcome of a regulatory capture.¹⁷⁰

3. Standards for the interaction between competition law and IP rights

Standards for the intersection between competition law and IP rights in Europe and the US have initially taken a formalist perspective focusing on the scope of the IP rights, their value or their essential function¹⁷¹. This did not rely on a case-by-case analysis of the economic effects of the interaction between competition law and IP rights on incentives to innovate or the dissemination of the invention but on a formalistic analysis of the scope of the IP right, its value, its essential function or the intent of the patent holder. Most recently, competition authorities in Europe and in the United States have opted for a balancing approach that compares welfare effects between, on the one hand static allocative efficiency and, on the other hand, dynamic efficiency on a case by case basis. These tests, although more economically oriented than the formal standards focusing on the scope of the IP rights, are difficult to apply in practice and may lead to favour competition law over IP rights in most circumstances.

a. Formalistic standards for the IP/Competition Law interface

(i) Standards focusing on the scope or value of the IP right

¹⁶⁶ Mark A Lemley, 'Property, Intellectual Property and Free Riding' (2005) 83 Texas Law Review 1031.

¹⁶⁷ Paul M Romer, 'When Should We Use Intellectual Property Rights?' (2002) 92 American Economic Review 213-216.

¹⁶⁸ Nordhaus (n 27).

¹⁶⁹ William Landes and Richard Posner, *The Economic Structure of Intellectual Property Law* (Harvard University Press 2003) 415; Bouckaert (n 143) 805 (noting that IP rights 'are exogenous to the inner logic of private law' and 'the only difference (with government regulation) is that the users of the ideas compensate producers directly without the intermediation of the government').

¹⁷⁰ Hovenkamp *The Antitrust Enterprise – Principle and Execution* (n 139) 250-251 (giving examples of interest-group capture of IP protection).

¹⁷¹ See, Michael Carrier 'Resolving the Patent-Antitrust Paradox Through Tripartite Innovation' (2003) 56 Vanderbilt Law Review 1047.

Standards focusing on the scope of the IP rights have taken different forms. First, the inherency doctrine, or limited license doctrine, protects the practices inherent to the exercise of the IP right from the application of competition law.¹⁷² For example, “an output restriction imposed on licensees is encompassed by the patent holder’s right to refuse to license to manufacturers altogether”.¹⁷³ In *Bement*, the Supreme Court recognized the right of a patent holder to impose price restrictions on licensees, as the patent holder disposes the right to charge any price (even monopolistic) if it would reserve the market to itself.¹⁷⁴ According to the Court, “(t)he object of the patent laws is monopoly, and the rule is, with few exceptions, that any conditions which are not in their very nature illegal with regard to this kind of property, imposed by the patentee and agreed to by the licensee for the right to manufacture or use or sell the article, will be upheld by the courts, and the fact that the conditions in the contracts keep up the monopoly, does not render them illegal”.¹⁷⁵ The doctrine was extended in order to grant antitrust immunity to patent holders imposing tying restrictions to their licensees, forcing them to limit the use of the patented product with unpatented products supplied by the patent holder.¹⁷⁶ The assumption was that if the licensees were happy to accept this additional burden it is because of the competitive superiority of the patented invention that provided the right to the patent holder to control the market for unpatented goods. The impact of this jurisprudence was to extend the rights of the patent holder to exclude, use and control a market of unpatented goods. The inherency doctrine, very favorable to the interests of patent holders, was abandoned following the introduction of the Clayton Act 1914 in which tying clauses restricting competition were made illegal, irrespective of whether they concerned patented or unpatented goods.¹⁷⁷ The Supreme Court overruled *Dick* in *Motion Picture Patents* referring to the Clayton Act, in which the Court condemned a licensing provision requiring operators of motion picture projectors to screen film only produced by the manufacturer¹⁷⁸ and confirmed in *Morton Salt Co. v Suppiger Co.* that the use of the patent monopoly to restrain competition in the marketing of the unpatented goods for use with the patented one constituted a patent misuse and was contrary to public policy.¹⁷⁹ Following this turn, the US antitrust authorities have been relatively hostile to IP rights, culminating with the formulation of the so called “Nine No-Nos”, a set of practices involving IP rights which were to be found to infringe antitrust law.¹⁸⁰

¹⁷² Vladimir Bastidas Venegas, ‘Shifting Towards a Dynamic Efficiency Test?: Evaluating Licensing Agreements under Antitrust Law’ in Steven Anderman and Ariel Ezrachi (eds) *Intellectual property and Competition Law – New Frontiers* (Oxford University Press 2011) 461-485.

¹⁷³ *Ibid* 466.

¹⁷⁴ *Bement v National Harrow Co.*, 186 US 70 (1902) cited by V. Bastidas Venegas (n 172) 466.

¹⁷⁵ *Ibid* 70.

¹⁷⁶ *Henry v AB Dick Company*, 224 US 1 (1912).

¹⁷⁷ Clayton Act, Section 3.

¹⁷⁸ *Motion Picture Patents Company v Universal Film Manufacturing Company et al.*, 243 US 502 (1917).

¹⁷⁹ *Morton Salt Co. v Suppiger Co.*, 314 US 488 (1942).

¹⁸⁰ Bruce B Wilson, ‘Patent and Know-How License Agreements: Field of Use, Territorial, Price and Quantity Restrictions’ Address Before the Fourth New England Antitrust Conference (6 November 1970). The list was developed by Bruce Wilson, a former deputy assistant attorney general for antitrust in the 1970s and included mandatory package licensing (patent pools), tying of unpatented supplies, mandatory grant-back clauses, compulsory payment of royalties in amounts not reasonably related to sales of the patented product, tie-outs, post-sale price restrictions on resale by purchasers of patented products.

In *US v General Electric*, the Supreme Court suggested a different standard for the interaction between competition law and IP rights.¹⁸¹ The case concerned a restriction on the price of patented goods imposed by the patent holder to the licensee. The Court focused for the first time on the extent of the reward received by the patent holder and held that “the patentee may grant a license to make, use and vend articles under the specification of his patent for any royalty or upon any condition the performance of which is *reasonably within the reward* which the patentee by the grant of the patent is entitled to secure”.¹⁸² According to the Court, “one of the valuable elements of the exclusive right of a patentee is to acquire profit by the price at which the article is sold [...] (t)he higher the price, the greater the profit, unless it is prohibitory”.¹⁸³ Although this case law favors the interests of the patent holder as opposed to that of licensees, when the patent holder grants a license to make and vend the patented article, the use of the term “reasonable” opens the door to some form of control of the restrictions on price or methods of sale imposed by the patent holder. Commentators have suggested different standards to account for the reasonableness of the restriction¹⁸⁴.

Baxter proposed a “comparability test” according to which “a patentee is entitled to extract monopoly income by restricting utilization of his invention” as long as the restriction is confined “as narrowly and specifically as the technology of his situation and the practicalities of administration permit”.¹⁸⁵ Baxter’s assumption is that the bargaining between the patent holder and the licensee sets the reward for each patented invention and provides information on the value of the patent for society. Any restriction confined to the exploitation of the patented invention and not extending to unpatented items will thus be immune from the antitrust laws. However, antitrust law should capture restrictions that potentially may harm the bargaining process, which is understood as being comparable to the value of the invention to licensees and to society. Any restriction affecting the genuineness of the bargaining process, for example a restriction protecting licensees from competition by other licensees, or a restriction allowing the monopolization of the end product in competition with other substitutable technologies, and thus leading to the sharing of the monopolistic profits between licensor and licensee, impacts on the function of the bargaining process as a mechanism for determining the reward to the patent holder and thus falls within the scope of antitrust intervention as going beyond the value of the patent.

Taking a Chicago school of antitrust economics perspective, Bowman advanced a “competitive superiority” test, which would allow a patentee to utilize a restrictive practice if the reward to the patentee represents “the patented product’s competitive superiority over substitutes”.¹⁸⁶ Bowman distinguishes between profit maximization (which may include the monopolistic price) and the extension of the legal patent monopoly to unpatented products. Only when the latter is established, the practice will fall under the scope of the antitrust laws. Hence,

¹⁸¹ *US v General Electric*, 272 US 476 (1926).

¹⁸² *Ibid* 489 (emphasis added).

¹⁸³ *Ibid* 490.

¹⁸⁴ For more analysis, see Carrier (n 171); Bastidas Venegas (n 172).

¹⁸⁵ William F Baxter, ‘Legal Restrictions on Exploitation of the Patent Monopoly: An Economic Analysis’ (1966) *Yale Law Journal* 267. For a critical analysis, see Michael A Carrier, ‘Unravelling the Patent-Antitrust Paradox’ (2002) 150(3) *University of Pennsylvania Law Review* 761, 795-796.

¹⁸⁶ Ward S Bowman, *Patent and Antitrust Law: A Legal and Economic Appraisal* (University of Chicago Press 1973).

according to this standard, antitrust law will not apply to a practice that aims to deal with free-riding concerns, price discrimination or quality control, to the extent that these will not extend the monopoly rent to unpatented products.

In Europe, the development of standards for the interaction between competition law and IP rights is further complicated by the division of competence between the EU and its Member States with regard to IP law and competition law: Competition law is mainly an EU competence, if inter-state trade is affected, while the creation of systems of intellectual property remains the competence of the Member States. Starting with *Consten & Grundig* on the granting of a trade mark,¹⁸⁷ the EU courts have asserted on numerous occasions that the “existence” of IP rights granted under national law is not affected by the European treaties, while the “exercise” of the IP rights may fall within the scope of EU competition law. This distinction is based first, on the drafting of the Treaty which, in the context of the free movement of goods provisions of the Treaty, grants to Member States the possibility to justify quantitative restrictions to trade for the protection of intellectual property rights (Article 36 TFEU), second, on the fact that Article 345 TFEU provides that Member States’ systems of property law should be protected. The distinction between “existence” and “exercise” may be subject to criticism as it is difficult to distinguish between the core of the IP right, its scope, and its exercise, unless the distinction reflects a decision over a list of legitimate activities that can fall within the scope of the IP right, similar to the approach followed in the US with regard to the scope of the IP rights. For example, would the sale of the IP right fall within the scope of EU competition law or would it be part of the existence of the right, assuming that this covers as any property right the use and sale of the right?

The European Courts have proceeded to a formalistic approach by defining the scope of the IP rights as linked to the “subject matter” and the “essential function” of the specific IP rights. The concept of the “specific subject-matter” made it possible to determine what might be covered by the legal status of any industrial or intellectual property right without damaging the EU principles of competition or that of free movement. For instance, in the field of patents, the ‘specific subject-matter’ consists, in the Court of Justice’s view, in “the exclusive right to use an invention with a view to manufacturing industrial products and putting them into circulation for the first time [...] as well as the right to oppose infringements”.¹⁸⁸ The Court also found that “the basic function of the trade mark [is] to guarantee to consumers that the product has the same origin”,¹⁸⁹ a definition later expanded to cover the ability of trademark owners to oppose “any possibility of confusion to distinguish that product from products which have another origin”.¹⁹⁰ The Court referred to the purposive concept of “essential function” in order to expand the specific subject matter beyond the core rights previously identified. For example, in *American Home products*, the Court referred to the “essential function” of trademarks to grant to a trademark owner the right to prohibit a reseller of its goods from repackaging the products and then applying the trademark to the new package.¹⁹¹

¹⁸⁷ Joined cases C-56/64 and 58/64 *Consten and Grundig v Commission* [1966] ECR 299.

¹⁸⁸ Case 15/74 *Centrafarm BV and Adriaan de Peijper v Sterling Drug Inc* [1974] ECR 1147.

¹⁸⁹ Case 119/75 *Terrapin (Overseas) Ltd. v Terranova Industrie CA Kapferer & Co* [1976] ERR 1039.

¹⁹⁰ Case 102/77 *Hoffmann-La Roche & Co. AG v Centrafarm* [1978] ECR 1139.

¹⁹¹ Case C 3/78 *Centrafarm v American Home products corporation* [1978] ECR 1823.

In *Windsurfing*, the Court found incompatible with Article 101(1) TFEU a patent licensing agreement containing obligations placed on the licensees only to use components approved by the licensor and to sell the patented product in conjunction with a product outside the scope of the patent clauses.¹⁹² *Windsurfing* argued that the purpose of the requirement was solely to ensure that the products sold by the licensees were not of inferior quality and did not infringe the rights of other licensees, hence, they were covered by the specific subject-matter of the licensed patent rights. The Court found that such quality controls do not come within the specific subject-matter of the patent unless they relate to a product covered by the patent since their sole justification is that they ensure 'that the technical instructions as described in the patent and used by the licensee may be carried into effect'.¹⁹³ The Court found the "arbitrarily placed" obligation on the licensee only to sell the patented product in conjunction with a product "outside the scope of the patent" as not being "indispensable to the exploitation of the patent".¹⁹⁴

The distinction between "existence" and "exercise" has also affected the enforcement of Article 102 TFEU to IP rights. In *CICCRA/Renault* and *Volvo/Veng*, concerning the refusal by the automobile manufacturers to deliver to independent repairers the spare parts they were producing, the Court emphasised that "the right of the proprietor of a protected design to prevent third parties from manufacturing and selling or importing, without its consent, products incorporating the design constitutes the very subject-matter of his exclusive right", finding that "an obligation imposed upon the proprietor of a protected design to grant to third parties in return for a reasonable royalty, a licence for the supply of products incorporating the design would lead to the proprietor thereof being deprived of the substance of his exclusive right, and that a refusal to grant such a licence cannot in itself constitute an abuse of a dominant position".¹⁹⁵ The Court noted, however, that the "exercise" of an exclusive right could be subject to Article 102 TFEU in "exceptional circumstances" if there was "certain abusive conduct" and provided three examples of situations where Article 102 TFEU could be applicable: in this case (i) the excessive pricing of the patented products, (ii) the refusal to supply independent repair shops and (iii) failure to continue production of parts for car models still in circulation.¹⁹⁶ The concepts of "subject matter" and "essential function" of IP rights have been used in these cases as a shield to competition law enforcement. However, by opening the door for "certain abusive conduct" to fall under Article 102 TFEU the Court sapped the practical relevance of the "existence" / "exercise" distinction.

In *Magill*, a case involving the refusal by TV stations grant a copyright license for the relevant information on their day programmes, thus impeding *Magill* from launching a weekly TV guide, the General Court went as far as concluding that the broadcaster conduct was outside the essential function of the copyright when, "in the light of the details of *each individual case*, it is apparent that that right is exercised in such ways and circumstances as in fact to pursue an aim manifestly contrary to the objectives of Article [102 TFEU]".¹⁹⁷ According to the Court, "(i)n

¹⁹² Case 193/83 *Windsurfing International v Commission* [1986] ECR 611.

¹⁹³ *Ibid* para 45.

¹⁹⁴ *Ibid* para 57.

¹⁹⁵ Case 53/87 *CICCRA v Renault* [1988] ECR 6039; Case 238/87 *Volvo v Veng* [1988] ECR 6211, para 8.

¹⁹⁶ *Ibid* para 9.

¹⁹⁷ Case T-69/89 *RTE v Commission* [1991] ECR II-485; Case T-70/89, *British Broadcasting Corporation and BBC Enterprises Ltd v. Commission* [1991] ECR II-535, para 58 (British Broadcasting case); Case T-76/89, *ITP v Commission* [1991] ECR II-575.

that event, the copyright is no longer exercised in a manner which corresponds to its essential function [...] which is to protect the moral rights in the work and ensure a reward for the creative effort, while respecting the aims of, in particular, Article [102 TFEU]. Indeed, “(i)n that case, the primacy of [EU] law, particularly as regards principles as fundamental as those of the free movement of goods and freedom of competition, prevails over any use of a rule of national intellectual property law in a manner contrary to those principles”.¹⁹⁸ Although in its judgment on appeal the Court of Justice has not discussed this part of the General Court’s judgment and did not deal with the issue of the “subject matter” of the copyright in question, Advocate General Gulmann noted in his Opinion that “the right to refuse licences forms part of the specific subject-matter of copyright” and criticized the General Court’s conclusion for incorporating “the aim of the competition rules in the determination of the essential function of copyright” and thus for not accepting the competition law immunity of conduct falling within the scope of the “essential function” of the copyright.¹⁹⁹ The Court of Justice preferred instead to refer to the “exceptional circumstances” that conduct involving IP rights might fall under article 102 TFEU.²⁰⁰ The concept of “exceptional circumstances” has been interpreted broadly by the jurisprudence of the European Courts,²⁰¹ as well as national courts,²⁰² thus suggesting that the EU courts have abandoned their previous formalistic approach focusing on the definition of the scope of the IP right and its core for a more open-ended approach that would involve some form of case by case (economic) analysis.

It is noteworthy that in other occasions the EU Courts went beyond a purely formalistic distinction between the “existence”, the core of the IP right, and its “exercise” and considered the value of the IP right in envisioning the interaction between competition law and IP rights. In *Erawu-Jacquery v La Hesbignonne*, the Court held that a prohibition on the sale or export of basic seeds was not within Article 101 TFEU since considerable investment had been made in developing the basic seed.²⁰³ According to the Court, “a person who has made considerable efforts to develop varieties of basic seed which may be the subject-matter of plant breeders’ rights must be allowed to protect himself against any improper handling of those varieties of seed” and “to that end, the breeder must be entitled to restrict propagation to the growers which he has selected as licensees”.²⁰⁴

¹⁹⁸ Ibid British Broadcasting Case, para 58.

¹⁹⁹ Opinion of AG Gulman in Joined cases C-241/91 P and C-242/91 P, *Radio Telefis Eireann (RTE) and Independent Television Publications Ltd (ITP) v Commission* [1995] ECR I-743, para 38 & 70.

²⁰⁰ Joined cases C-241/91 P and C-242/91 P, *Radio Telefis Eireann (RTE) and Independent Television Publications Ltd (ITP) v. Commission* [1995] ECR I-743.

²⁰¹ See, for instance Joined cases C-241/91 P and C-242/91 P, (n 194), paras 10 & 50; Case C-418/01 *IMS Health GmbH & Co OHG v. NDC Health GmbH & Co KG* [2004] ECR I-5039, para 35, 37 (listing as constituting exception circumstances the refusal to grant license of an input the supply of which was indispensable for carrying on the business in question, the fact that such refusal prevented the emergence of a new product for which there was a potential consumer demand, the fact that it was not justified by objective considerations and was likely to exclude all competition in the secondary market); Microsoft CFI case (n 120), para 331 and 647 (noting that prejudice may arise where there is a limitation not only of production or markets, but also of technical development, thus extending the scope of application of Article 102 TFEU to refusals to license) (IMS Health case).

²⁰² See, for instance in the UK, *Intel Corp. v Via Technologies Inc.* [2002] EWCA Civ 1905 (Civil Division – Court of Appeal), para 48 (noting that exceptional circumstances may extend beyond those contemplated in *Magill* and *IMS*).

²⁰³ Case 27/87 *SPRL Louis Erawu-Jacquery v La Hesbignonne SC* [1988] ECR 1919. See also, Case 258/78, *Nungesser v. Commission* [1982] ECR 2015.

²⁰⁴ Ibid para 10.

(ii) Standards focusing on the intent of the IP holder

A possible alternative standard is to focus on the intent of the monopolist.²⁰⁵ Some US courts have adopted standards based on intent advancing the view that a monopolist should not “rely upon a pretextual business justification to mask anticompetitive conduct”.²⁰⁶ This might involve some analysis of the subjective intent of the undertaking, by looking to documents, emails or statements. However, it is unclear at what level of management the decision-maker should look to find evidence of intent and it is quite common for executives to use language that suggests intent to exclude a competitor.

An alternative would be to examine objective intent as this is indicated by the behaviour of the undertaking. In its Preliminary Report of the Sector Inquiry on the Pharmaceutical Sector, the Commission noted that “intention can [...] be taken into account in competition law assessments”,²⁰⁷ although it is clear that the intent of the applicants does not form part of the assessment of patent claims.²⁰⁸ The *Astra Zeneca* decision of the European Commission, confirmed by the General Court, acknowledged the importance of evidence of anticompetitive intent in demonstrating that a conduct is liable to have anticompetitive effects.²⁰⁹ The General Court found that while abuse is an objective concept, “[...] intention can still be taken into account to support the conclusion that the undertaking concerned abused a dominant position, even if the abusive conduct actually took place”.²¹⁰ In any case, evidence of intent plays a limited role in Article 102 analysis.²¹¹

b. Economic balancing tests

Balancing tests weigh the restriction of allocative efficiency or other anticompetitive effects of the conduct involving IP rights from one side and the possible benefits of these IP rights in inducing innovation and dynamic efficiency on the other side. Innovation is considered positively as it enhances competition in the market and provides a variety of choice to

²⁰⁵ Carrier (n 171) 793.

²⁰⁶ *Image Technical Services, Inc. v Eastman Kodak Co.* 125 F.3d 1195 (9th Cir. 1997), 1219.

²⁰⁷ European Commission, Pharmaceutical Sector Inquiry, Final Report (n 43), footnotes 375 and 376.

²⁰⁸ For example, in the context of the DG Comp’s Pharmaceutical sector inquiry, the European Patent Office argued against a scrutiny of the intent of applicants in applying for patent rights for purposes of competition law. See, Communication from the Commission, Executive Summary of the Pharmaceutical Sector Inquiry Report, available at < http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/communication_en.pdf >, last accessed 28 April 2013, p. 7

²⁰⁹ Commission Decision, *AstraZeneca* (n 20) Annex A, para. 13.

²¹⁰ Case T-321/05 *AstraZeneca AB v Commission* [2010] ECR II-2805, para 334, although on appeal the Court of Justice did not explicitly confirm this position: Case C-457/10P *AstraZeneca AB v. Commission* (6 December, 2012).

²¹¹ See, for instance, Case C-549/10 *Tomra Systems ASA v Commission* (April 12, 2012), para 19 (noting that “it is clearly legitimate for the Commission to refer to subjective factors, namely the motives underlying the business strategy in question”), paras 21 and 22 (observing that “the Commission is under no obligation to establish the existence of such intent on the part of the dominant undertaking in order to render Article [102 TFEU] applicable” and that “(t)he existence of an intention to compete on the merits, even if it were established, could not prove the absence of abuse”).

consumers. Contrary to the formalistic analysis conducted under the scope or intent tests, balancing tests involve some consideration of the economic effects of the IP rights in the specific market configuration.

One of the most sophisticated balancing tests is Kaplow's ratio test, which examines the ratio between "the reward the patentee receives when permitted to use a particular restrictive practice" and "the monopoly loss that results from such exploitation of the patent".²¹² According to Kaplow, 'patentee reward' and 'monopoly loss' refer, respectively, to the incremental reward and loss resulting from the practice in question.²¹³ The ratio depends on how much the reward is increased or decreased as opposed to how much the monopoly deadweight loss is increased or decreased by each individual licensing restriction. This ratio will be compared to an "optimal ratio", which is the ratio for increasing the patent life by one year, assuming that patent law has made the right balance of incentives and rewards at the first place.²¹⁴ If the individual ratio for the specific practice is lower than the optimal ratio, the practice should be prohibited. If it is higher, then one should measure whether the licensing practice costs less (in providing the incremental reward) than the last year of patent life. If the individual ratio is higher, the practice is permitted. Contrary to other standards, the test provides a balancing on a case-by-case basis of the possible effects of the exercise of the IP rights on allocative and dynamic efficiency. However, the test is resource intensive, as it requires ascribing particular numbers for patentee reward and monopoly loss, a difficult task already for economists not to mention the courts.²¹⁵ It also focuses on total welfare and does not grant a specific weigh to the welfare of consumers, unless we assume that the interest of the consumers long term coincide with that of the inventor, which might be problematic in jurisdictions in which the protection of the consumers is the primary objective of competition law. One might also object to the narrow view of the concept of innovation in this test as it emphasizes the reward for the pioneer inventor (standalone innovation), without considering the possibility of cumulative innovation.²¹⁶ The implicit assumption that the patent system has made the right balance of incentives and rewards, in order to define the optimal ratio, may also be questioned.

Among the various economic balancing tests that have also been suggested, Ordovery argues that the critical trade-off is "between incentives for investment in knowledge creation and the overall efficiency with which this investment is achieved".²¹⁷ For Ordovery, both competition law and intellectual property law contribute to the two stages of competition that are "pertinent to the understanding of dynamic evolution of the economy": "(e)x ante competition occurs at the R&D stage (production of knowledge); (e)x post competition occurs at the product (or service)

²¹² Louis Kaplow, 'The Patent-Antitrust Intersection: A Reappraisal' (1984) 97 Harvard Law Review 1813, 1816.

²¹³ Ibid 1831-1832.

²¹⁴ Ibid 1830.

²¹⁵ Carrier (n 172) 798. As it has been noted by Janusz A Ordovery, 'Economic Foundations and Considerations in Protecting Industrial and Intellectual Property' (1984) 53(3) Antitrust Law Journal 503, 514 (noting that "it is unlikely that the analyst will have information that is precise enough to determine the movement of the ratio, especially in those close cases when, as a result of relaxation, both numerator and denominator of the ratio move in the same direction, as when a new practice increases both the innovator's reward and the monopoly loss").

²¹⁶ Bastidas Venegas (n 172) 473.

²¹⁷ Ordovery (n 215) 509.

stage”.²¹⁸ The presentation of the tension between these two areas as indicating a tension between monopoly and competition is thus incorrect:

“First of all, inasmuch as patent, copyright and trademark laws and antitrust law are all concerned with promoting efficient allocation of social resources, there can be no conflict on this account. In particular, both patent and antitrust law recognize that without clearly specified property rights the economic system is bound to collapse. And, second of all, antitrust law itself recognizes monopoly (market power) as a reward for innovative effort”.²¹⁹

Hence, the conflict arises when the dynamic goals of the patent law clash with the static allocative goals of competition law, hence the conclusion that “the conflict between these two bodies of law reflects the trade-off between static and dynamic efficiency”.²²⁰ The comparison of static allocative efficiency effects and dynamic efficiency raises the issue of the discounting of the dynamic efficiency effects, “because the benefits from a given R&D investment flow over time they must be made commensurate with the up-front costs of the investment itself”.²²¹ Ordover conceptualizes the existence of two markets: the upstream market (of ideas, information and knowledge) and the downstream market (of products and services) arguing that these two markets are connected temporally but also intertemporally linked “in the sense that economic events (such as the intensity of competition) that occur in the upstream market have a prospective impact on competition and on allocative efficiency in the downstream market”.²²² He suggests the analysis of the effects of these practices and institutions in the form of a structured rule of reason that would look to market shares, market concentration and entry barriers at both levels of this “temporal vertical chain”. The analysis is more complicated than for other vertical agreements in the licensing context as the firm that sells the license participates both in the upstream (R&D) market as well as in the downstream (product or services) market, which suggests that the anticompetitive effect is more likely in the licensing context if the restriction is employed by a firm that operates in both markets. A practice is deemed efficient “if it leads to a lower cost of ‘producing’ the same ‘quantity’ of knowledge, new information or ideas”.²²³ Should it be necessary to weigh the pro-competitive effects in one market to the anti-competitive effects in the other, Ordover suggests giving a greater weight to expansions of the R&D output than to expansions (or contractions) of outputs of goods and services. In essence, his approach advances the following components in the structured rule of reason analysis: “(i) (t)he finegrain structure of both the downstream and upstream markets, (ii) (t)he actual legal interpretations of the patent, copyright and trade- mark laws: for example, are patents interpreted broadly or narrowly? (iii) (t)he strength of incentives for the creation of intellectual and industrial property provided by other tools of social policy that have an impact on knowledge and information creation, (iv) (t)he nature of the R&D activity itself. For example, are R&D expenditures being devoted to a ‘patent race’ towards a major breakthrough where there can be (temporarily) only

²¹⁸ Ibid 510.

²¹⁹ Ibid 511.

²²⁰ Ibid

²²¹ Ibid 514.

²²² Ibid

²²³ Ibid 517.

one winner, or are these expenditures being devoted to minor process or product improvements that allow a number of winners to coexist as rivals in the marketplace”.²²⁴

Other economic balancing tests focus on the IP side of the equation and suggest an adjustment of the scope and strength of IP rights as a possible solution to the problem.²²⁵

Although not explicitly referring to a balancing test, the US DOJ and FTC *Intellectual Property Guidelines* in 1995 took a more positive view of IP rights and ended the period of hostility represented by the “Nine No Nos” approach previously followed by the US agencies, following a period during the 1980s during which the IP rights have been strengthened. The Guidelines advance that restraints in intellectual property licensing arrangements are evaluated under the rule of reason, the Agencies inquiring “whether the restraint is likely to have anticompetitive effects and, if so, whether the restraint is reasonably necessary to achieve procompetitive benefits that outweigh those anticompetitive effects”,²²⁶ by looking to the characteristics of the restraint (was it imposed by a competitor or a non-competitor, does it involve an exclusive license?) and a number of market factors (concentration, market shares, possible foreclosure or collusive effects). According to the Guidelines,

“(i)f the Agencies conclude that the restraint has, or is likely to have, an anticompetitive effect, they will consider whether the restraint is reasonably necessary to achieve procompetitive efficiencies. If the restraint is reasonably necessary, the Agencies will balance the procompetitive efficiencies and the anticompetitive effects to determine the probable net effect on competition in each relevant market”.

The Guidelines also put in place a “safety zone” recognizing that licensing arrangements often promote innovation and enhance competition and thus some degree of certainty should be offered to undertakings in order to encourage such activity. The safety zone encapsulates a balancing test, as it implies that such arrangements have positive effects on welfare. With regard to the effect on product markets, the licensor and its licensees collectively should account for no more than twenty percent of each relevant market significantly affected by the restraint. With regard to the effect on technology and innovation markets, there should be at least four or more independently controlled technologies in addition to the technologies controlled by the parties to the licensing arrangement. Alternatively, there should be four or more independently controlled entities in addition to the parties to the licensing arrangement possessing the required specialized assets or characteristics and the incentive to engage in research and development that is a close substitute of the research and development activities of the parties to the licensing agreement.²²⁷ There is no presumption that arrangements falling outside the “safety zone” are anticompetitive.

²²⁴ Ibid 518.

²²⁵ E.g. Kaplow ‘The Patent-Antitrust Intersection: A Reappraisal’ (n 212).

²²⁶ US DOJ & FTC, Antitrust Guidelines for the Licensing of Intellectual Property (April 6, 1995), Section 3.1, available at < <http://www.justice.gov/atr/public/guidelines/0558.htm#t21> > accessed 28 April 2013.

²²⁷ Ibid Section 4.3.

The EU Guidelines on Transfer of Technology Agreements seem to be inspired by the same principle.²²⁸ Their starting standpoint is that there is no inherent conflict between intellectual property rights and EU competition rules. According to the Commission,

“[...] both bodies of law share the same basic objective of promoting consumer welfare and an efficient allocation of resources. Innovation constitutes an essential and dynamic component of an open and competitive market economy. Intellectual property rights promote dynamic competition by encouraging undertakings to invest in developing new or improved products and processes. So does competition by putting pressure on undertakings to innovate. Therefore, both intellectual property rights and competition are necessary to promote innovation and ensure a competitive exploitation thereof”.²²⁹

The Guidelines refer to the concept of “dynamic competition”,²³⁰ which we will explore later in the report, but it is important here to note that although there is no presumption that intellectual property rights and licence agreements as such give rise to competition concerns, any eventual anticompetitive concerns will be assessed with an eye on the possible pro-competitive efficiencies, which must be “balanced against the negative effects on competition”.²³¹ The EU Guidelines also create a safe harbour for licensing arrangements that do not impose any hardcore restriction, such as a cartel, a resale price maintenance clause, restrictions on the exploitation and development of the licensee's own technology.²³² In the current version of the EU Regulation, the market share threshold to be applied for the purpose of the safe harbour depends on whether the agreement is concluded between competitors or non-competitors. In the case of agreements between competitors, which do not include a hardcore restriction, the market share threshold is 20 % and in the case of agreements between non-competitors it is 30 %, as in the latter case the activities of the parties are usually complementary to each other. Outside the safe harbour created by the market share thresholds individual assessment is required. The fact that market shares exceed the thresholds does not give rise to any presumption that the agreement is caught by Article 101 TFEU. In order to promote predictability beyond the application of these thresholds and to confine detailed analysis to cases that are likely to present real competition concerns, the Commission adds a second safe harbor, again with the exception of hardcore restrictions, when there are four or more independently controlled technologies in addition to the technologies controlled by the parties to the agreement that may be substitutable for the licensed technology at a comparable cost to the user.²³³ According to the Guidelines, in assessing whether the technologies are sufficiently substitutable, the relative commercial strength of the technologies in question must be taken into account.

In the context of Article 102 TFEU, the European Commission seems to have been inspired by the balancing approach in its *Microsoft* decision.²³⁴ The specific characteristics of

²²⁸ Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements (n 106).

²²⁹ Ibid para 7.

²³⁰ Ibid para 8.

²³¹ Ibid para 9.

²³² Article 4, Transfer of Technology Block Exemption Regulation 772/2004, [2004] OJ L23.

²³³ Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements (n 106) para. 131.

²³⁴ Commission Decision, *Microsoft/W2000* (COMP/C-3/37.792), 24 March 2004, available from <<http://www.europa.eu.int/comm/competition/antitrust/cases/decisions/37792/en.pdf>> accessed 28 April 2013 (Microsoft Commission Decision).

intellectual property rights were not *prima facie* taken into account. The Commission observed that “there is no persuasiveness to an approach that would advocate the existence of an exhaustive checklist of exceptional circumstances and would have the Commission disregard *a limine* other circumstances of exceptional character that may deserve to be taken into account when assessing a refusal to supply”.²³⁵ Microsoft has put forward the same justification as in the US litigation: the need to protect its own incentives to innovate by preserving its intellectual property rights.²³⁶ The Commission rejected that claim by affirming that intellectual property rights “cannot as such constitute a self-evident objective justification for Microsoft’s refusal to supply”.²³⁷ It followed in that respect the position of the Federal Circuit in the US *Microsoft* case.²³⁸

The Commission considered that innovation is an objective for both intellectual property and competition law²³⁹ and adopted a balancing test focused on innovation incentives concluding that

“[...] a detailed examination of the scope of the disclosure at stake leads to the conclusion that, on balance, the possible negative impact of an order to supply on Microsoft’s incentives to innovate is outweighed by its positive impact on the level of innovation of the whole industry (including Microsoft). As such the need to protect Microsoft’s incentives to innovate cannot constitute an objective justification that would offset the exceptional circumstances identified”.²⁴⁰

On examination, the test seems broader than the “new product” rule. First, the Commission takes into account the incentives of the competitors of the dominant firm to innovate in the future. This was not an issue considered in *Magill* and *IMS/NDC Health* where the question was about products which, absent the refusal to supply, have been sold or were to be offered in the market. Second, the Commission included in its analysis the incentives of Microsoft to innovate. In *Magill* and *NDCHealth* the Court only referred to the dominant firm’s competitors, which had the intention to enter the secondary market in order to offer a new product and were excluded by the dominant firm. However, in *Microsoft*, the Commission took also into account Microsoft’s incentives to innovate in comparing the situation where article 102 applies with the alternative situation where Microsoft’s anti-competitive behaviour remains unfettered.²⁴¹ According to the Commission,

“Microsoft’s research and development efforts are [...] spurred by the innovative steps its competitors take in the work group server operating system market. Were such competitors to disappear, this would diminish Microsoft’s incentives to innovate”.²⁴²

²³⁵ Ibid para 555.

²³⁶ Ibid para 709.

²³⁷ Ibid para 710.

²³⁸ *U.S. v Microsoft Corp.*, 253 F.3d 34, 63 (Microsoft’s argument that the exercise of an intellectual property right cannot give rise to antitrust liability “borders on the frivolous”) (US Microsoft Case).

²³⁹ Microsoft Commission Decision (n 228) para 712.

²⁴⁰ Ibid para 783.

²⁴¹ Ibid para 725.

²⁴² Ibid para 725.

Because of the nature of the market, Microsoft's incentives to innovate were maintained, while those of its competitors were also preserved.

The analysis of the incentives of a dominant firm or of its rivals in the secondary market to innovate extends the scope of article 102 TFEU in comparison with the new product rule. This is based on the assumption that competitive pressure increases the dominant firm's incentives to innovate. This is also linked to the belief that a competitive market is the optimal structure for innovation.

The Commission's DG Comp Staff Discussion paper on Article 102 TFEU, adopted in 2005, suggested the adoption of two tests: the "new product rule" and the "incentives to innovate" test.²⁴³ First, in order to constitute an infringement, the refusal to grant a licence should prevent: "the development of the market for which the licence is an indispensable input, to the detriment of consumers. This may only be the case if the undertaking which requests the licence does not intend to limit itself essentially to duplicating the goods or services already offered on this market by the owner of the IPR, but intends to produce new goods or services not offered by the owner of the right and for which there is a potential consumer demand".²⁴⁴ Second, "a refusal to licence an IPR protected technology which is indispensable as a basis for follow-up innovation by competitors may be abusive even if the licence is not sought to directly incorporate the technology in clearly identifiable new goods and services. The refusal of licensing an IPR protected technology should not impair consumers' ability to benefit from innovation brought about by the dominant undertaking's competitors".²⁴⁵

The implementation of this test in practice would, however, raise important difficulties. The courts are not generally well equipped to conduct the type of prospective cost-benefit analysis that would be necessary in order to balance the incentives of the dominant firm and its rivals to innovate. In that respect, *Microsoft* was a relatively easy case. The Commission did not undertake the difficult task to balance incentives to innovate, as it assumed that the incentives of Microsoft were not hampered by the prohibition of the refusal to supply interoperability. However, if the dominant firm's incentives to innovate were affected by the prohibition of the refusal to licence, it would have been necessary to conduct a proper cost-benefit analysis, which may prove a difficult task for the judiciary.

In its *Microsoft* judgment, the General Court rephrased the condition of the "new product rule" by considering that prejudice to consumers may arise where there is limitation of technical development.²⁴⁶ The Court did not however balance Microsoft's incentives to innovate with those of its competitors, thus focusing on a version of the balancing test that would compare static allocative inefficiencies to dynamic efficiency benefits. This version of the test may lead to an extension of the scope of Article 102 TFEU, as it takes into account only the incentives of the rivals of the dominant firm to innovate without considering those of the dominant firm.

²⁴³ DG Competition discussion paper on the application of Article 82 of the Treaty to exclusionary abuses (hereinafter referred as DG Staff Discussion Paper) December 2005, available at <<http://www.europa.eu.int/comm/competition/antitrust/others/discpaper2005.pdf>> accessed 28 April 2013, paras 237 -242.

²⁴⁴ *Ibid* para 239.

²⁴⁵ *Ibid* para 240.

²⁴⁶ *Microsoft* CFI case (n 118), para 647.

The Commission followed up with its Guidance on its enforcement priorities with regard to exclusionary abusive practices by integrating the “new product rule” to the consideration of consumer harm in the context of Article 102 TFEU in the form of dynamic effects, advancing that “consumer harm may, for instance, arise where the competitors that the dominant undertaking forecloses are, as a result of the refusal, prevented from bringing innovative goods or services to market and/or where follow-on innovation is likely to be stifled”.²⁴⁷ The Commission seems however to subject dynamic efficiency gains to a more demanding analysis, than anticompetitive dynamic effects: as for all types of objective justifications, “the dominant undertaking will generally be expected to demonstrate, with a sufficient degree of probability, and on the basis of verifiable evidence, that the following cumulative conditions are fulfilled: (i) the efficiencies have been, or are likely to be, realised as a result of the conduct [...] (ii) the conduct is indispensable to the realisation of those efficiencies: there must be no less anti-competitive alternatives to the conduct that are capable of producing the same efficiencies [...], (iii) the likely efficiencies brought about by the conduct outweigh any likely negative effects on competition and consumer welfare in the affected markets [...] (iv) the conduct does not eliminate effective competition, by removing all or most existing sources of actual or potential competition”.²⁴⁸ The Commission further notes that “rivalry between undertakings is an essential driver of economic efficiency, including dynamic efficiencies in the form of innovation”, thus requiring a residual degree of competition to be maintained in all cases.²⁴⁹ The current approach does not take into account efficiencies with low probability of being realized or passed on to consumers. A similar approach is followed in the context of article 101(3) TFEU.²⁵⁰

The risk of the economic balancing approach is that in practice courts and competition authorities may emphasize more restrictions to allocative efficiency than dynamic efficiency benefits. The possibility that these economic balancing tests might lead in practice to weigh more static efficiency as opposed to dynamic effects has led to the view that competition law should turn to dynamic analysis and embrace the goal of innovation.

c. Competition law and the turn to dynamic analysis

(i) “Dynamic competition” as a criterion of competition law analysis

The competition/static allocative efficiency bias of the economic balancing test has led many authors to suggest a re-orientation of competition law towards a more dynamic approach

²⁴⁷ Communication from the Commission — Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings, [2009] OJ C 45/7, para. 87 (Guidance Paper).

²⁴⁸ Ibid para 30.

²⁴⁹ Ibid

²⁵⁰ European Commission, Notice - Guidelines on the application of article 81(3) [2004] (n 107), para. 51, noting that “(a)ll efficiency claims must [...] be substantiated so that the following can be verified: (i) the *nature* of the claimed efficiencies, (ii) the *link* between the agreement and the efficiencies, (iii) the *likelihood* and *magnitude* of each claimed efficiency and (iv) how and *when* each claimed efficiency would be achieved”. According to the Commission, the parties should describe and explain in detail what is the nature of the efficiencies and how and why they constitute an objective economic benefit and substantiate any projections as to the date from which the efficiencies will become operational so as to have a significant positive impact in the market. Unsubstantiated efficiency claims are rejected. These requirements also apply in the context of Article 102 TFEU.

that would incorporate innovation as an objective of competition law²⁵¹. The concept of “dynamic competition” regroups a number of theories that might be distinguished from the “static competition model”.²⁵² Jerry Ellig and Daniel Lin outlined the principal strands of dynamic competition law scholarship: (i) Schumpeterian competition does not focus on price and output but on new products, new technologies, new sources of supply, new forms of organization. Possession of market power is found consistent with vigorous competition; (ii) Evolutionary competition acknowledges that firms develop different routines for doing things and that the bundle of routines that best enables undertakings to grow and prosper is selected by the competitive process, which should be left to operate freely (without intervention); (iii) from an Austrian perspective, information about production methods and consumers’ desires is incomplete. Hence, competition is a process by which firms discover new resources and better ways to satisfy consumers; (iv) a path dependence approach would focus on increasing returns and network effects, acknowledging the fact that consumers may be locked in to inferior technologically options and that competition often takes the form of “winner takes it all”; Finally, (v) a resource based perspective will emphasize capabilities in transforming resources to valuable outputs and thus increase profitability.²⁵³ A common characteristic of these different theories of “dynamic competition” is that they focus on innovation as a key component of the competitive process.

Several authors have explored the implications of such dynamic analysis in competition law. Richard Gilbert and Steven Sunshine have argued for the explicit integration of dynamic efficiency concerns in merger control, through the concept of “innovation markets”.²⁵⁴ David Evans and Richard Schmalensee have noted that “firms engage in dynamic competition for the market, through sequential winner-take-all races to produce drastic innovations, rather than through static price/output competition in the market”.²⁵⁵ They argued for a competition law

²⁵¹ See, Michael A. Carrier, *Innovation for the 21st Century: Harnessing the Power of Intellectual Property and Antitrust Law* (Oxford University Press 2011).

²⁵² See, for this opposition, Tepperman and Sanderson (n 93) 5, “Competition based on the successive introduction of new or better products over time is called dynamic competition. Dynamic competition based on investment in R&D may be thought of as a form of “competition for the market” in contrast to price competition which is “competition in the market.” This characterization is overly simplistic, however. There are certainly many situations in which both forms of competition operate—firms may compete for customers’ business by reducing price and improving quality for existing goods, and by pursuing innovation in an effort to introduce new goods to market. Nonetheless, this way of dichotomizing competitive rivalry serves to emphasize an important contrast. Static views of competition take the existing set of products and market participants as given, describing the outcome of competitive behaviour among those market participants using strategic instruments such as pricing or advertising that can be applied and varied in the “short term”. Dynamic competition involves the creation of new products and potentially also new markets, along with the replacement or obsolescence of older products. It also implicitly or explicitly involves entry and exit by firms—there is no guarantee that today’s successful firms will be able to offer the product attributes demanded by tomorrow’s consumers”.

²⁵³ Jerry Ellig and Daniel Lin, ‘A Taxonomy of Dynamic Competition Theories’ in Jerry Ellig (ed), *Dynamic Competition and Public Policy – Technology, Innovation and Antitrust Issues* (Cambridge University Press 2011) 16-44.

²⁵⁴ Richard J Gilbert and Steven C Sunshine, ‘Incorporating Dynamic Efficiency Concerns in Merger Analysis: The Use of Innovation Markets’ (1995) 63 *Antitrust Law Journal* 569.

²⁵⁵ David S Evans and Richard Schmalensee, ‘Some Economic Aspects of Antitrust Analysis in Dynamically Competitive Industries’ in Adam B Jaffe, Josh Lerner and Scott Stern (eds), *Innovation Policy and the Economy*, Vol. 2, (MIT Press 2002). On the distinction between competition for the market and competition in the market, see Paul A Geroski, ‘Competition in Markets and Competition for Markets’ (2003) 3 *Journal of Industry, Competition and Trade* 151.

analysis in “dynamic industries” that would require explicit consideration of “dynamic competition”, thus making a distinction between competition law applying to the “new economy” or “high technology” and the “old economy”. Christopher Pleatsikas and David Teece have criticized the static analytical frameworks applied in defining markets and measuring market power without due noting that the basis for competition in many high technology industries is fundamentally different from that in more mature and stable industries, as there is a much greater emphasis on performance-based, rather than price-based, competition and hence a more “dynamic analysis” is required.²⁵⁶ Sidak and Teece have argued for a “neo-Schumpeterian framework for antitrust analysis that favors dynamic competition over static competition [that] would put less weight on market share and concentration in the assessment of market power”.²⁵⁷ The concept of “dynamic competition” has been given different definitions. Some have emphasized the time dimension of the concept arguing that “(d)ynamic competition models entail the prediction of future competitive outcomes”.²⁵⁸ Others, have observed that “dynamic is a shorthand for a variety of rigorously competitive activities such as significant product differentiation and rapid response to change, whether from innovation or simply new market opportunities ensuing from changes in “taste” or other forces of disequilibrium”,²⁵⁹ taking leave from the concept of equilibrium, at least in a non-stochastic form. As it was often repeated, dynamic analysis “views competition through a broader lens and focuses less on outcomes and more on process”.²⁶⁰ This view might require a complete revamp of the way competition law addresses innovation.

Michael Katz and Howard Shelanski observed the multiplier effect that innovation may have on efficiency gains. They suggested the consideration of dynamic efficiencies, even if these are not certain, thus breaking with the conventional hostility of competition law to efficiency gains that are not certain, by advancing an expected value approach that would account both the magnitudes and probabilities of potential, merger-related efficiencies.²⁶¹ Competition authorities and courts should use a decision-theoretic approach under conditions of uncertainty, which would select the course of action that yields the highest expected payoff, “where the expected value of taking an action is equal to the payoffs associated with the different possible outcomes that can follow from that action weighted by the probabilities that those outcomes will occur if the action is taken”.²⁶² Such an approach would require the decision-makers to base their judgment on broader evidence about how competition is evolving in the specific industry. Jonathan Baker has also suggested an industry-specific approach in competition law enforcement by arguing that competition law authorities should target enforcement to appropriate industries: “winner-take-all markets” or markets where future product competition remains unaffected by

²⁵⁶ Christopher Pleatsikas and David Teece, ‘The analysis of market definition and market power in the context of rapid innovation’ (2001) 19 *International Journal of Industrial Organization* 665.

²⁵⁷ Gregory J Sidak and David J Teece, ‘Dynamic Competition in Antitrust Law’ (2009) 5(4) *Journal of Competition Law & Economics* 581.

²⁵⁸ Douglas H Ginsburg and Joshua D Wright, ‘Dynamic Analysis and the Limits of Antitrust Institutions’ (2012) 78(1) *Antitrust Law Journal* 1.

²⁵⁹ David J Teece, ‘Favoring Dynamic over Static Competition: Implications for Antitrust Analysis and Policy’ in Geoffrey A Manne and Joshua D Wright, *Competition Policy and Patent law under Uncertainty* (Cambridge University Press 2011) 203, 211.

²⁶⁰ *Ibid* 217.

²⁶¹ Howard A Shelanski and Michael L Katz, *Mergers and Innovation* (2007) 74 *Antitrust Law Journal* 1.

²⁶² *Ibid*.

current product market competition, as a result of pending technological change, growing demand or regulatory intervention.²⁶³

Other authors have challenged the view that competition law analysis is static and does not accommodate dynamic competition concerns. Cal Shapiro criticized the view that innovation and dynamic competition concerns should lead competition law to be extremely cautious of imposing limits on the conduct of dominant firms or prohibiting mergers in dynamic industries, noting that today's market leaders may be able to maintain or extend their dominance while slowing the pace of innovation and arguing that competition doctrine does not actually focus on static analysis.²⁶⁴ More recently, Gans argued that static analyses are not misleading and can be a good proxy for dynamic effects, with the exception of cases where the predominant mode of commercialization by innovative entrants is via cooperation rather than competition with incumbent firms, in which case both static and dynamic analyses should be combined.²⁶⁵

Joshua Wright has expressed doubts as to the state of current theoretical apparatus and empirical evidence in competition law to conduct the complex trade-offs required by dynamic competition law analysis.²⁶⁶ Drawing on previous work by Harold Demsetz,²⁶⁷ Wright highlights the complexity of the task of weighing effects on the several dimensions of competition that might be affected by a specific conduct. In some cases one dimension of competition (e.g. price) is negatively correlated to another (e.g. new products, innovation or quality) and this negative correlation means that a policy selecting the optimal mix of competitive forms requires knowledge of the "technical rates of substitution between these forms in order to covert different forms into common units of consumer welfare".²⁶⁸ However, as Wright notes, competition law analysis "does not provide an analytically coherent method to equalize measures of intensity, efficiency or consumer welfare".²⁶⁹ Wright argues against presumptions of anticompetitive effect in this context and an overall guiding principle of deference to the competitive process, in the absence of clear and convincing evidence of substantial consumer harm.²⁷⁰

It follows from these divergent points of view that there is some disagreement over the adequate methodologies to be followed for the incorporation of innovation and "dynamic competition" in competition law analysis. Some would favour an adjustment to the existing tools, by paying more attention to possible dynamic anticompetitive effects and taking more into account dynamic efficiency gains, eventually biasing the economic balancing process in favour of dynamic efficiency considerations. Others would encourage a tailored-made approach to

²⁶³ Jonathan Baker, 'Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation' (2007) 74(3) *Antitrust Law Journal* 575.

²⁶⁴ Carl Shapiro, 'Antitrust, Innovation, and Intellectual Property - Testimony Before the Antitrust Modernization Commission' (8 November 2005).

²⁶⁵ Joshua S Gans, 'When Is Static Analysis a Sufficient Proxy for Dynamic Considerations? Reconsidering Antitrust and Innovation' (2011) 11(1) *Innovation Policy and the Economy* 55.

²⁶⁶ Joshua D Wright, 'Antitrust, Multidimensional Competition and Innovation – Do we Have an Antitrust-Relevant Theory of Competition Now?' in Geoffrey A Manne and Joshua D Wright (eds), *Competition Policy and Patent law under Uncertainty* (Cambridge University Press 2011) 228-251.

²⁶⁷ Harold Demsetz, '100 Years of Antitrust: Should we Celebrate?' Brent T. Upson Memorial Lecture, George Mason University School of Law, Law and Economics Center (1991).

²⁶⁸ Wright, 'Antitrust, Multidimensional Competition and Innovation' (n 258) 241.

²⁶⁹ *Ibid* 233

²⁷⁰ *Ibid* 251.

“dynamic competition” by developing new concepts and tools,²⁷¹ such as innovation markets and an innovation-centred competition law.²⁷²

It is important here to note that whichever approach with regard to the integration of “dynamic competition” is followed, this will have little implications on the relation between competition law and IP rights. In other words, this is a different question than the interaction between “static competition” and “dynamic competition” in competition law analysis. First, there should be no assumption that intellectual property rights promote “dynamic competition”, as this depends on the nature of innovative activity in the industry (including the degree of cumulative innovation) or the strength of IP protection, among other factors. If that is true the fact that competition law focuses on “static competition” or “dynamic competition” is irrelevant, with regard to the interaction between these two areas of law. Indeed, a static competition law analysis might be the least imperfect option, if it is compared to the choice of protecting IP rights that would not advance “dynamic competition” but would restrict “static competition”. Protecting “static competition” is better than not protecting any form of competition. Second, even if one assumes that intellectual property rights promote “dynamic efficiency” or “dynamic competition”,²⁷³ a rather blunt assumption with regard to the available evidence so far, it is also unclear how that would affect the interaction between competition law and intellectual property rights. If competition law pursues both “dynamic competition” and “static competition”, it would be a far superior instrument than intellectual property law, which would sacrifice “static competition” for “dynamic efficiency”, unless one considers that “dynamic efficiency” weighs more than “static efficiency” and that the methods for incorporating dynamic efficiency in intellectual property law are superior than those available in competition law analysis. However, there is no reason to assume that intellectual property law has developed a superior “technology” than competition law for incorporating dynamic efficiency concerns in the analysis. It is only if competition law pursues exclusively “static efficiency” that it would constitute an inferior alternative to intellectual property law, should it be assumed that intellectual property promotes “dynamic efficiency”. Hence, by bringing “dynamic competition” and innovation to the centre of competition law, competition law scholars may finish by transforming competition law to a more effective regulatory instrument than intellectual property in promoting innovation.

(ii) Technology and innovation markets in US and EU competition law

The US DOJ and FTC Guidelines for the licensing of IP note that an arrangement can affect price or output in three types of markets: a market for existing goods and services, a technology market consisting of intellectual property that is licensed and its close substitutes, and an innovation market consisting of the research and development directed to particular new or improved goods or processes and the close substitutes for that research and development,

²⁷¹ Gilbert and Sunshine (n 247); Marcus Glader, *Innovation Markets and Competition Analysis: EU Competition Law and US Antitrust Law* (Edward Elgar 2006).

²⁷² Michael A Carrier, ‘Resolving the Patent-Antitrust Paradox Through Tripartite Innovation’ (2003) 56 *Vanderbilt Law Review* 1047.

²⁷³ Assuming that innovation is the first order preference of consumers and that dynamic competition is the process that enables consumers to maximise their utility, the concepts of “dynamic efficiency” and “dynamic competition” are close to each other and can be used interchangeably.

“tomorrow’s products”.²⁷⁴ Technology and innovation markets serve as analytical tools to predict changes in the price or output of goods and services.

According to the US DOJ and FTC Guidelines, technology markets consist of the intellectual property that is licensed and its close substitutes, technologies or goods that are close enough substitutes significantly to constrain the exercise of market power with respect to the intellectual property that is licensed. The concept is used when rights to intellectual property are marketed separately from the products in which they are used, technology being an input, which is integrated either into a product or a production process. That would be the case, for example, of an upstream firm that is not vertically integrated downstream to the production and commercialisation of the products. The concept is referred to also in the EU Block exemption regulation on the transfer of technology agreements and Guidelines.²⁷⁵ The delineate the relevant technology market, both the European Commission and the US Agencies will apply the hypothetical monopolist test (or SSNIP test),²⁷⁶ which identifies the smallest group of technologies and goods over which a hypothetical monopolist of those technologies and goods likely would exercise market power, by imposing a small but significant and non-transitory increase of the price (e.g. the royalties) of a level of 5-10%.

The concept of innovation markets enables competition authorities to assess the effects of an anticompetitive practice on research and development efforts and eventually future product markets. Gilbert and Sunshine have suggested a five steps process for identifying innovation markets: first, identify the overlapping R&D activities of the merging firms, second, locate any alternative sources of R&D, third, evaluate actual and potential competition from downstream products that could make it unprofitable for a hypothetical R&D monopolist to raise price or reduce output; fourth, assess potential competitive effects on investment and R&D that could result from the increased concentration brought about by the practice; fifth, assess any efficiencies arising from the practice that would likely increase output and lower the post-practice price of R&D in the innovation market under review, in order to determine whether such efficiencies would be sufficient to outweigh any likely anticompetitive effects.²⁷⁷ An alternative to the innovation markets approach would be to use potential competition theory and in particular consider the possibility of limit pricing, the strategy of constraining price in order to reduce the risk of future entry.²⁷⁸ Applying potential competition analysis would however require that one of the firms is already an established supplier of the relevant good and service, which is not always the case and some effects, for example possible delays in introducing a new drug in the market, cannot be captured by the tool of potential competition.²⁷⁹ The concept of innovation market thus extends the ability of competition law to assess effects on research tools or processes competition.

²⁷⁴ US DOJ and FTC Guidelines on the licensing of IP rights, (n 220) Section 3.2. The distinction between these three markets was first noted by William F Baxter, ‘The Definition and Measurement of Market Power in Industries Characterized by Rapidly Developing and Changing Technologies’ (1984) 53 *Antitrust Law Journal* 717.

²⁷⁵ Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements (n 106) para 19-25.

²⁷⁶ Small but Significant and Non-transitory Increase in Price test.

²⁷⁷ Gilbert and Sunshine (n 247) 596-597.

²⁷⁸ Robert J Hoerner, ‘Innovation Markets: New Wine in Old Bottles?’ (1995) 64 *Antitrust Law Journal* 49.

²⁷⁹ Richard J Gilbert, ‘Competition and Innovation’ in Wayne D Collins (ed) 1 *ABA Section of Antitrust Law, Issues in Competition Law and Policy* 577, 583 (American Bar Association 2008) Ch 26.

The concept has nevertheless been subject to a number of criticisms: first, R&D is only an input to the production of goods and services and competition law analysis should focus on outputs, the actual supply of future goods and services; second, the sources of R&D may be difficult to identify as discoveries may come from unexpected places; third, economic theory does not provide a solid empirical basis on the assumption that the decrease in the number of firms engaged in R&D will affect negatively innovation (the link between market structure and innovation), as the elimination of redundant expenditure, the reduction of costs and the possibility for the firm to fully capture the results of the R&D programme might accelerate the process of innovation (if one takes a Schumpeterian view).²⁸⁰

Recognizing that a licensing arrangement may affect the development of goods that do not yet exist, the US DOJ & FTC Guidelines acknowledge that they will analyse such an impact either as a separate competitive effect in relevant goods or technology markets, or as a competitive effect in a separate innovation market.²⁸¹ The concept will be used only when the capabilities to engage in the relevant research and development can be associated with specialized assets or characteristics of specific firms. The authorities will rely on market data or evidence from buyers' and market participants' assessments of the competitive significance of innovation market players. The use of this concept in some high profile merger cases has been controversial.²⁸²

From the other side of the Atlantic, the EU Guidelines do not ascribe the same importance to this concept than to that of technology markets. The Commission accepts that licence agreements may affect innovation markets, but in analysing such effects, the Commission prefers to confine itself to examining the impact of the agreement on competition within existing product and technology markets. It is only in a limited number of cases that it might be useful and necessary to also define innovation markets, for example where the agreement affects innovation aiming at creating new products and where it is possible at an early stage to identify research and development poles, in which cases it will analyse whether after the agreement there will be a sufficient number of competing research and development poles left for effective competition in innovation to be maintained.

(iii) Dynamic analysis in the context of competition law assessment in merger control and antitrust

In most cases, dynamic analysis is incorporated in competition law assessment with the consideration of “dynamic efficiencies”. As it has been noted by some commentators, “dynamic efficiency in competition economics is connected to whether appropriate incentives and ability exist to increase productivity and engage in innovative activity over time, which may yield cheaper or better goods or new products that afford consumers more satisfaction than previous consumption choices”, the concept relating to “the ability of a firm, industry or economy to

²⁸⁰ Ibid.

²⁸¹ US DOJ and FTC Guidelines on licensing IP rights (n 220), Section 3.2.3.

²⁸² See, for instance, Genzyme Corporation / Novazyme Pharmaceuticals, Inc. and the statement of Chairman T. Muris (critical to the use of the concept): <<http://www.ftc.gov/os/2004/01/murisgenzymestmt.pdf>> accessed 28 April 2013.

exploit its potential to innovate, develop new technologies and thus expand its production possibility frontier”.²⁸³ Both static and dynamic efficiencies should be taken into account in competition law enforcement. We have previously noted that the evidential requirements for the proof of efficiency gains in competition law, in particular in the context of the EU, might render more difficult the consideration of dynamic efficiencies.²⁸⁴

The main difficulties relate, first, to the verification requirement as well as to the requirement that efficiency gains and their passing on to consumers (whose position should not be worse than that prior the anticompetitive conduct) must be probable enough, in view of the fact that the burden of proof rests on the defendants.²⁸⁵ Firms may have difficulty to meeting the requisite level of proof with regard to causation and the quantification of the incremental surplus created by the additional innovative effort, most of which will relate to future products.²⁸⁶ Remote dynamic efficiencies may also be discounted to some extent against short-term anticompetitive effects. Second, the requirement that restrictions should be indispensable for the realization of dynamic efficiency gains (in merger control, any dynamic efficiency put forward should be merger specific) raises the issue of causation and of the existence of less restrictive to competition alternatives to achieve the same dynamic efficiency gain.²⁸⁷ Third the trade-off between static allocative inefficiency, because of higher prices, and dynamic efficiency is particularly difficult to make. Some have opted for a “dynamic pure consumer welfare standard”, in order to balance any consumer harms flowing from short run price increases with consumer benefits from price decreases in the longer run resulting from diffusion of the merger-induced cost reductions to other competitors.²⁸⁸ However, as we have highlighted above, applying an appropriate discount rate to future time periods, in order to ensure that greater weight will be given to relatively more certain, short run, effects than uncertain dynamic efficiencies, might

²⁸³ Andrej Fatur, *EU Competition Law and the Information and Communication Technology Network Industries* (Hart Publishing 2012) 40. See also, Jesús Huerta De Soto, *The Theory of Dynamic Efficiency* (Routledge 2009).

²⁸⁴ The US Guidelines seem to offer more flexibility to the parties to argue efficiency gains. The comparison of anticompetitive harms and procompetitive efficiencies will “necessarily” be a qualitative one.

²⁸⁵ E.g. according to the Guidelines on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings (EC) [2004] OJ C31/03, paras 79-88, efficiency claims have to be ‘substantiated’, ‘verifiable’, ‘precise and convincing’, and should be quantified ‘[w]here reasonably possible’. Section 9.3 of Form CO requires notifying parties making efficiency claims to provide detailed quantification, including estimated cost savings and assessments of the significance of new product introductions and improvements.

²⁸⁶ For a detailed analysis, see Christian R Fackelmann, ‘Dynamic Efficiency Considerations in EC Merger Control. An Intractable Subject or a Promising Chance for Innovation?’ Oxford Centre for Competition Law and Policy Working Paper No. L-09/06, pp. 23-32 (concluding that “quantification of dynamic efficiencies appears to be beyond the (pre-sent) powers of economic analysis, let alone of enforcement practice”. Even if the assessment of dynamic efficiencies is purely qualitative, the EU Horizontal Merger Guidelines require firms to provide material on the basis of which a “clearly identifiable positive impact on consumers, not a marginal one”, thus raising the standard of proof for the parties).

²⁸⁷ EU Commission’s Guidelines on the application of Article 81 of the EC Treaty [now Article 101 TFEU] to technology transfer agreements (n 106) require undertakings arguing dynamic efficiency gains to explain and demonstrate why seemingly realistic and significantly less restrictive alternatives would be significantly less efficient from a dynamic perspective. Again, the US Agencies seem more flexible. The US Guidelines note that “the Agencies will not engage in a search for a theoretically least restrictive alternative that is not realistic in the practical prospective business situation faced by the parties”.

²⁸⁸ Steven C Salop, ‘Efficiencies in Dynamic Merger Analysis’ (1995), Statement at FTC Hearings on Global and Innovation-Based Competition, available at www.ftc.gov/opp/global/saloptst.htm accessed 29 April 2013.

defeat the purpose of favoring “dynamic competition”. In conclusion, the static and dynamic efficiency trade-off will in most cases take the form of a “rough comparison”.²⁸⁹

A possible solution to the risk of over-considering static allocative inefficiency effects would be to weigh more heavily liked dynamic efficiencies than static effects. Tepperman and Sanderson provide two reasons for that.²⁹⁰ First, there may be many sources for dynamic efficiencies, while only one for allocative inefficiency, in view of the important spill-over effects that innovation in one market or sector might bring to other markets or sectors and thus to a different set of consumers. This effect is not taken into account by conventional competition law analysis that focuses on the effects on a relevant market (as a result of the partial equilibrium analysis performed) and does not incorporate in the analysis cross-market effects. The European Commission takes into account the positive welfare effects of an agreement as long as “the group of consumers affected by the restriction and benefiting from the efficiency gains are substantially the same”.²⁹¹ The Court’s position on this issue seems more liberal. In a number of cases on the application of Article 101(3) the Court had regard to advantages arising from the agreement, not only for the specific relevant market but also for “every other market on which the agreement in question might have beneficial effects”.²⁹² Second, price effects tend generally to be transitory, given the dynamically competitive nature of competition, as higher profitability will generally attract new entry and a new round of innovation in order to displace the leader. This conclusion relies on the assumption that the market leader would not be able to block or deter entry through the exercise of exclusive rights (e.g. IP rights) or strategic conduct (e.g. predatory pricing, tying).

What are the different sources of dynamic efficiency gains?²⁹³ First, dynamic efficiency gains may derive from variable and fixed costs savings across time. Second, they may arise from a combination of R&D programs or different capabilities creating synergies (these may relate to the integration of R&D activity, productive assets or distribution capacity, that is different segments of the innovative process). In the case of R&D synergies this might reduce the risk of a wasteful duplication and the elimination of redundant R&D. Third, they might be economies of scale or scope in R&D activities, the assumption being that an R&D program of some size is more productive than two separate programs of half size. The avoidance of patent thickets issues and a better IP rights enforcement might also be considered as enhancing dynamic efficiency, by enhancing returns to R&D efforts. Increased financial resources on innovation and improving the spread of R&D risk constitute further sources of dynamic efficiency gains.

It is worthy of note that neither the EU Guidelines on the Transfer of Technology nor the US Guidelines on the licensing of IP examine the different sources of dynamic efficiency and provide guidance on how the trade-off between static and dynamic efficiency will be done in practice. The Guidelines prefer a general presumptions approach that would assume the

²⁸⁹ Tepperman and Sanderson (n 94) 33

²⁹⁰ Ibid

²⁹¹ European Commission, Notice - Guidelines on the application of article 101(3) (n 107) para. 43. The Commission notes, however, in its Horizontal Merger Guidelines (n 278) para. 79, that “(c)onsumers may also benefit from new or improved products or services, for instance resulting from efficiency gains in the sphere of R&D and innovation”, thus not confining the consideration of efficiencies to a specific relevant market.

²⁹² Case T-86/95 *Compagnie générale maritime and others v Commission* [2002] ECR II-2011, para. 130; Case T-213/00 *CMA GCM & Others v Commission* [2003] ECR II-913, para. 227.

²⁹³ Tepperman and Sanderson (n 94) 34-38.

existence of dynamic efficiencies if the licensing arrangement falls within one of the two safe harbours of the regulation (structural indicators, such as market shares or the number of technologies available). The more recent US Horizontal Merger Guidelines include a new section on innovation and product variety, which incorporates dynamic competition in the analysis of anticompetitive effects. It is recognized that “competition often spurs firms to innovate” and that the US Agencies will intervene if “a merger is likely to curtail the merger firm’s innovative effort below the level that would prevail in the absence of the merger”.²⁹⁴ The possible effects on innovation could take different forms, such as a reduced incentive to continue with an existing product-development effort or a reduced incentive to initiate the development of new products. With regard to dynamic efficiencies, the Guidelines note that “in evaluating the effects of a merger on innovation, the Agencies consider the ability of the merged firm to conduct research or development more effectively”, in particular if this may spur innovation without affecting short-term pricing.²⁹⁵ Yet, it is also recognized that “the Agencies should consider the ability of the merger firm to appropriate a greater fraction of the benefits resulting from its innovations”, including licensing and intellectual property conditions, which “affect the ability of a firm to appropriate the benefits of its innovation”. Although the Guidelines acknowledge that most weight is given to the results of competition analysis over the short term, it is also noted that “(r)esearch and development cost savings may be substantial and yet not be cognizable efficiencies because they are difficult to verify or result from anticompetitive reductions in innovative activities”, thus opening the door to a more flexible consideration of dynamic efficiencies.

The trade-off between static anticompetitive effects (allocative inefficiency) and dynamic efficiencies may even be more complicated in a multi-jurisdictional setting. One may envisage a situation in which a licensing practice affects consumers in jurisdiction A but enables a licensor established in jurisdiction B to profit from dynamic efficiency gains. In principle, this should not pose a problem, as the consumers of jurisdiction A would eventually benefit from the outcome of the innovation in the long run. Yet, it is possible that the product will first be introduced in the market of jurisdiction B, thus benefiting the consumers of this jurisdiction, without the consumers of jurisdiction A being able to enjoy within a reasonable time frame, for different reasons, the benefits of the sacrifice of allocative efficiency for the purposes of innovation. This issue may become a concern, from a political economy perspective, if the core of the inventive activity is concentrated in some jurisdictions only.

d. The need to apply an overall “decision theory” framework

It should be clear by now that the case law has developed multiple standards in order to tackle the anticompetitive exercise of intellectual property rights. Despite the use of the “property rights” rhetoric, the competition law authorities and the courts do not apply the essential facilities doctrine and take into account the need to protect innovation. The standards used are nevertheless complex and fact-specific and ultimately a source of uncertainty for firms.

²⁹⁴ US DOJ & FTC Horizontal Merger Guidelines (2010), available at <<http://www.ftc.gov/os/2010/08/100819hmg.pdf>> Section 6.4

²⁹⁵ Ibid Section 10.

The need for an overall approach is highlighted by Ahlbors, Evans and Padilla who suggest an “error-cost framework”, which is structured in two stages. First, economic theory and evidence will be used “to assess the cost and likelihood of errors resulting from condemning welfare-increasing business practices or condoning welfare reducing ones”; In a second stage, “a legal rule that minimizes the expected cost of intervention taking into account the possibility of legal error” will be “selected from a spectrum of standards ranging from *per se* legality to *per se* illegality, including the rule of reason”.²⁹⁶ The authors start from the assumption that “what matters is the impact of forcing access on the incentives to innovate, and not the nature of the property rights at stake”.²⁹⁷ What applies to intellectual property rights should also apply to other property rights as both are “the result of previous investment or risk taking”.²⁹⁸

This starting position may be criticised as it is not always true that IP rights are the result of significant previous investment or risk taking. In addition, this approach does not take into account the different degrees of “previous investment and risk taking”. An insignificant inventive effort will be considered the same way a significant one would be. The authors’ assumption may be explained by the fact that they try to avoid the difficulties of balancing incentives to innovate with anticompetitive effects (allocative inefficiencies), which, they consider, is “an extremely complex” and “daunting task” for courts.²⁹⁹ However, even if one could agree that this is an important issue which has not yet been resolved, this is not a valid reason to adopt such a strong assumption.

According to Ahlborn, Evans and Padilla, the existence of compulsory licensing will inevitably reduce the incentive *ex ante* for the IP holder to take the risk to invest in new products.³⁰⁰ However, even if this hypothesis may be a plausible generalisation, it does not always hold. Increasing competition in the secondary market will exercise pressure on the IP holder to innovate as this will be the only way to maintain its competitive advantage against its competitors. The disincentive created by the compulsory license may well exist but it is also important to consider that the IP holders will still have a first mover advantage as it would probably not be before a substantial period of time that their rivals would be able to compete in equal terms. Moreover, it would be possible for the inventor to increase his revenues from licensing.

Furthermore, Ahlborn, Evans and Padilla apply the “cost-error framework” to antitrust but not to intellectual property, which, they assume, is the outcome of a meritorious investment and “risk taking” process.³⁰¹ However, this double standard is not justifiable. Ironically, this approach supposes that decision analysis theory may be useful for assessing antitrust, which is essentially a judge-made law that follows an adversarial process but not for examining IP rights, which are granted by a regulatory body and therefore it is more likely to be subject to decision errors or capture. Indeed, the protection of IP has expanded considerably the last twenty years following the transformation of economic structures and the focus on international

²⁹⁶ Ahlborn, Evans and Padilla (n 161)

²⁹⁷ Ibid 1141.

²⁹⁸ Ibid and 1156.

²⁹⁹ Ibid 1143 to 1144.

³⁰⁰ Ibid 1129.

³⁰¹ Ibid 1141.

competitiveness. Even trivial “inventions” may benefit from an IP protection. The *ex post* case by case analysis of competition law may be at certain regards superior than the *ex ante* approach of intellectual property, as market information is most likely available after the IP rights has been granted. However, a procedure of post-grant review may mitigate this concern.

Furthermore, the protection of intellectual property is backwards looking. The examination of the patent application focuses on the “prior art” and there is no assessment of the existence of possible substitutes or potential competition. The problem is particularly acute in emerging industries where prior art is difficult to locate as it is disseminated in scientific journals or in the form of informal know how, with the result that the patent officer’s examination can be easily flawed, from a welfare perspective.

Type I errors (over-expansion of IP rights) are therefore more likely to happen than type II errors (under-inclusiveness of IP protection). By limiting the negative effects of type I errors, caused by a broad intellectual property protection, competition law is a necessary complement to intellectual property law.

On the above basis, competition law’s intervention is justified if IP law has failed to guarantee the level of innovation in the market.³⁰² This is what happened in *Magill* where intellectual property rights were granted to simple data without any inventive effort having been made. The European Community’s Directive on the Legal Protection of databases, which provides high levels of protection for databases may illustrate the side-effects of a careless intellectual property protection.³⁰³ The Directive was adopted following an intense effort of lobbying by database companies and is a compromise between the lower “sweat of the brow” copyright protection that was granted to databases in some EU Member States (e.g. UK, Ireland) and the higher standard of copyright protection granted by other Member States (e.g. France). The directive established a legal framework giving a high level of copyright protection to “original” databases, which “by reason of the selection or arrangement of their contents constitute the author’s own intellectual creation”³⁰⁴ and a new form of “*sui generis*” protection to non-original databases if the “maker” of the database showed “that there has been qualitatively and/or quantitatively a substantial investment in either the obtaining, verification or presentation of the contents” of the database.³⁰⁵

The Directive protects a simple compilation of existing basic information, which is the result of some kind of investment. The objective of this form of IP protection is therefore not to protect innovation but to protect the investments of the database “makers” against the “parasitic behaviour” of free riders.³⁰⁶ The *sui generis* protection granted has the potential to produce important anticompetitive effects. Contrary to a copyright protection, which distinguishes

³⁰² Thomas Dreier, ‘Balancing Proprietary and Public Domain Interests: Inside or Outside of Proprietary Rights?’ in Rochelle C Dreyfuss, Harry First and Diane Zimmerman (eds) *Expanding the Boundaries of Intellectual Property* (Oxford University Press 2001) 295, 312 (antitrust remedies “should be reserved for exceptional situations where intellectual property law has failed”).

³⁰³ Parliament and Council Directive 96/9/EC (n 38).

³⁰⁴ Ibid Art. 3 (1).

³⁰⁵ Ibid Art. 7 (1).

³⁰⁶ First Evaluation of Directive 96/9/EC (n 39) One could remark the “free riders” property rights rhetoric used by the Commission.

between the idea, which stays in the public domain, and the expression of the idea, which is protected, the database directive gives the possibility to exclude the re-utilisation of the data by others. This is particularly risky for competition, “in cases, where a database is the only possible source of the data contained therein, such as telephone directories, television program listings or schedules of sporting events” and may result in “an absolute downstream information monopoly in derivative information products and services”.³⁰⁷

In response to this risk, article 16 of the Directive required the Commission to submit a report examining whether the application of the *sui generis* right “has led to abuse of a dominant position or other interference with free competition which would justify appropriate measures being taken, including the establishment of non-voluntary licensing arrangements.” Indeed, while the first proposal of the Database Directive provided for the possibility of compulsory licensing in order to limit the risk of anti-competitive effects, these provisions have been removed from the final version of the Directive, which only limited the right of the database “maker” in exceptional circumstances.³⁰⁸ This is probably why recital 47 provides that the Directive is without prejudice to the application of Community or national competition rules, making it therefore possible to limit the rights of the database “makers” through competition law. The application of competition law can therefore be seen to be triggered by the failure of the text of the database Directive to take properly into account the protection of cumulative innovation and competition.

It is remarkable that the national courts and the European Court of Justice have interpreted the “quantitative substantial investment” requirement of the Directive restrictively in order to avoid the emergence of anticompetitive effects.³⁰⁹ Indeed, the ECJ curtailed the scope of the protection by explicitly refusing to adopt the “spin off” doctrine, developed by some Dutch courts, which would make it possible to provide *sui generis* protection for databases generated as “by-products” of the main activities of the Database “maker” on which the later has a *de facto* monopoly (e.g. television program listings, railway schedules etc), which is the situation that arose in *Magill*.³¹⁰ The ECJ distinguished between creating and obtaining data in order to assemble the contents of a database.³¹¹ It also considered that the activity of creating materials that make up the content of a database did not constitute substantial investment in the sense of

³⁰⁷ P Bernt Hugenholtz ‘Abuse of Database Right: Sole-Source Information Banks under the EU Database Directive’ in Lévêque and Shelanski (eds) (n 129) 203.

³⁰⁸ Proposal for a Council Directive on the Legal Protection of Databases, COM (92) 24 final, OJ 1992 C 156/4, art. 8(1) and 8(2).

³⁰⁹ Case C-46/02 *Fixtures Marketing Ltd. V Oy Veikkaus Ab* [2004] ECR I-10365; Case C-203/02 *The British Horseracing Board Ltd and Others v William Hill Organisation Ltd* [2004] ECR I-10415; Case C-338/02 *Fixtures Marketing Limited v. AB Svenska Spel* [2004] ECR I-10497; Case C-444/02 *Fixtures Marketing Ltd v. Organismos Prognostikon Agonon Podosfairou AE – OPAP* [2004] ECR I-10549. For an analysis of national courts’ decisions, see First Evaluation of Directive 96/9/EC (n 39) p. 11.

³¹⁰ Estelle Derclaye, ‘Databases Sui Generis Right: Should We Adopt the Spin-off Theory’ (2004) 26(9) European Intellectual Property Review 402.

³¹¹ Case C-46/02 *Fixtures Marketing Ltd. V Oy Veikkaus Ab* (s 302) para 34 (“the expression ‘investment in [...] the obtaining [...] of the contents’ of a database must [...] be understood to refer to the resources used to seek out existing independent materials and collect them in the database, and not to the resources used for the creation as such of independent materials”).

the directive and that therefore a single-source database was not protected under *sui generis* rights.³¹²

By adopting a narrow interpretation of the scope of the Directive the Court avoided the situation where single-source databases would benefit from the *sui generis* protection and as a result enable the database “makers” to abuse their dominant position on the information they create. The recent evaluation report of the Database directive also considers the risk of potential anticompetitive effects and examines different options, ranging from the simple repeal of the Directive to the preservation of the status-quo. While the Commission notes the “attachment” of the EU database industry to the *sui generis* protection for factual compilations and their “considerable resistance” to any reform (an indication of the “specific-interest group” character of this legislation), it also remarks on the weak empirical support for such a system of protection.³¹³ Less restrictive to competition alternatives for protecting the investments made exist. Indeed, the United States opted for a system of liability and not of property rights in protecting the investments of the database “makers”.³¹⁴ The US approach is based on unfair competition principles which protect the database “maker” against misappropriation only if, as a result, there will be market harm.³¹⁵

The limitation of the scope of intellectual property protection makes it also possible to consider *ex ante* (before the grant of the IP right) the effects of intellectual property protection on competition and constitutes therefore a conceivable option for attaining the right balance between competition law and intellectual property.³¹⁶ The European Commission’s proposal to amend Directive 98/71/EC on the legal protection of designs³¹⁷ illustrates the dialectic relationship between the scope of IP rights and competition law.³¹⁸ By removing Members States’ option to provide design protection for spare parts of complex products, such as automobiles, the Commission seeks to avoid the constitution of monopolies in the aftermarket for spare parts for which “there is no practical alternative”.³¹⁹ The proposal codifies the case law of the ECJ in *Renault* and *Volvo*, whose effect could have been curtailed by the generalisation of

³¹² Case C-203/02 *The British Horseracing Board Ltd and Others v. William Hill Organisation Ltd*, (s 302) para 35; Mark J Davison and P Bernt Hugenholz ‘Football Fixtures, Horseraces and Spin Offs: The ECJ Domesticates the Database Right’ (2005) *European Intellectual Property Review* 113; Estelle Derclaye, ‘The Court of Justice Interprets the Database Sui Generis Right for the First Time’ (2005) *European Law Review* 420.

³¹³ First Evaluation of Directive 96/9/EC (n 39) p. 5.

³¹⁴ *Feist Publications v Rural Telephone Service Company*, 499 U.S. 340 (1991) [The Supreme Court refused to accept that information contained in a telephone directory could be protected under copyright laws. A database may only be copyrighted if it possesses some “minimal degree of creativity”].

³¹⁵ Guido Westkamp ‘Protecting Databases under US and European Law: Methodical Approaches to the Protection of Investments between Unfair Competition and Intellectual Property Concepts’ (2003) 34 *International Review of Industrial Property and Copyright Law* 772.

³¹⁶ The adjustment of the duration of the IP protection is another option. See, Kaplow ‘The Patent-Antitrust Intersection: A Reappraisal’ (n 206) 1840 (“[...] setting the patent life and determining patent-antitrust doctrine are interdependent endeavors; in other words, the system of equations that defines the optimization process must be solved simultaneously”). However, this is unlikely to happen as the duration of the IP protection is usually determined by international treaties, which is impossible or extremely difficult to amend.

³¹⁷ Directive 98/71/EC on the legal protection of designs [1998] OJ L 289/28.

³¹⁸ Proposal for a Directive of the European Parliament and of the Council amending Directive 98/71/EC on the legal protection of designs COM(2004) 582 final.

³¹⁹ *Ibid* 9.

the “new product rule” to all refusals to license IP rights, following the ECJ’s judgment in *IMS/NDC* some months earlier.

C. Illustrations of the interaction between competition law and IP rights: a comparative EU/US perspective

1. The Patenting Process and Unreasonable Patent Exclusions

a. Refusal to license

Both EU and US competition law start from the general rule that a duty to deal with a competitor should be rarely imposed to dominant undertakings. There is no obligation for the IP holder to license the use of their IPRs to others. This rule may be explained for three reasons, all accepted as significant in both US antitrust and EU competition law. First, undertakings should have the right to choose their trading partners and to dispose freely of their property.³²⁰ Second, existence of an obligation to license, even for a fair remuneration, “may undermine undertakings’ incentives to invest and innovate and, thereby, possibly harm consumers”.³²¹ Third, at least in US antitrust law, this cautious approach may also be explained by a concern over the administrability of competition law, as “an antitrust court is unlikely to be an effective day-to-day enforcer of these detailed sharing obligations”, should a duty to license be imposed more frequently.³²²

In US antitrust law, unilateral refusals to license have been dealt under the following three broad standards.³²³ In *Data General Corp. v Grumman Systems*, the First circuit although it noted that “exclusionary conduct can include a monopolist’s unilateral refusal to license a copyright”, it created a rebuttable presumption that unilateral refusals to license is a “presumptively valid business justification for any immediate harm to consumers”.³²⁴ In *Image Technical Services v Eastman Kodak*, the Ninth circuit modified slightly that presumption to emphasize more market reality.³²⁵ The court recognized that, although intellectual property owners are not immune from antitrust liability, “patent and copyright holders may refuse to sell or license protected work”. Yet, it also noted that intellectual property justifications in this case

³²⁰ Guidance Paper (n 247) para. 75; See also in US antitrust law, *United States v Colgate & Co.*, 250 U.S. 300, 307 (1919) “[i]n the absence of any purpose to create or maintain a monopoly, the [Sherman Act] does not restrict the long recognized right of [a] trader or manufacturer engaged in an entirely private business, freely to exercise his own independent discretion as to parties with whom he will deal”.

³²¹ Guidance Paper (n 247) para. 75; See also in US antitrust law, *Trinko* (n 119) (“Firms may acquire monopoly power by establishing an infrastructure that renders them uniquely suited to serve their customers. Compelling such firms to share the source of their advantage is in some tension with the underlying purpose of antitrust law, since it may lessen the incentive for the monopolist, the rival, or both to invest in those economically beneficial facilities”).

³²² In *Trinko*, the Court was cautious in finding exceptions to the general rule of no duty to aid a rival, precisely “because of the uncertain virtue of forced sharing and the difficulty of identifying and remedying anticompetitive conduct by a single firm”.

³²³ Herbert Hovenkamp, Mark D Janis and Mark A Lemley, ‘Unilateral Refusals to License’ (2006) 2(1) *Journal of Competition Law & Economics* 1.

³²⁴ *Data General Corp. v Grumman Systems*, 36 F2d 1147, 1187 (1st Cir. 1994) (“an author’s desire to exclude others from use of its copyrighted work is a presumptively valid business justification for any immediate harm to consumers”).

³²⁵ *Image Technical Services v Eastman Kodak*, 125 F3d 1195 (9th Cir. 1997).

were pretextual, hence bringing forward the role of intent in the analysis, noting that “neither the aims of intellectual property law, or the antitrust laws justify allowing a monopolist to rely upon a pretextual business justification to mask anticompetitive conduct”.³²⁶ Finally, in *Re Independent Service Organizations Antitrust Litigation*, the Federal Circuit rejected the presumptive legality approach for one that would extend antitrust immunity to refusals to license, in the absence of any indication of illegal tying, fraud in the Patent and Trademark Office or sham litigation.³²⁷ The Federal Circuit created a rule of per se legality for refusals to license, even in cases in which the refusal to license would have the effect to influence a market other than that covered by the relevant IPR.³²⁸ Following the Supreme Court’s judgment in *Verizon Communications v Law Offices of Curtis V Trinko*, it looks highly unlikely that a unilateral refusal to deal (and even more a unilateral refusal to license) would be found to violate Section 2 of the Sherman Act.³²⁹

In the context of EU competition law, the application of article 102 TFEU, prohibiting the abuses by an undertaking of its dominant position, to unilateral refusals to license IP rights has been an important issue since the decisions of the ECJ in *Volvo v Veng and CICRA v Renault*.³³⁰ In these cases, the ECJ held that the right of the proprietor of a protected design to prevent third parties from manufacturing and selling or importing without its consent products incorporating the design does not constitute an abuse of a dominant position. Otherwise, the IP holder would be deprived of the substance of his exclusive right. However, the Court did not go as far as to create an irrebutable presumption for the exercise of IP rights. A refusal to license may constitute an abuse if the exercise of the IP right would involve, in the part of the undertaking, “certain abusive conduct”, such as an arbitrary refusal to supply spare parts to independent repairers, the fixing of prices at an unfair level or a decision no longer to produce spare parts for a particular model.³³¹ In subsequent decisions, the Court extended the scope of article 102 TFEU to cover the acquisition by a dominant firm of an exclusive patent license of an alternative technology³³² or a refusal to license IP rights in order to defend an existing monopoly power.³³³

The case law has moved subsequently to develop a standard which takes into consideration the specificity of intellectual property rights. The ECJ adopted the “new product” rule in *Magill* where it held that the exercise of an exclusive right by the intellectual property owner may, in “exceptional circumstances”, involve abusive conduct.³³⁴ Exceptional circumstances consist of the following: (i) access is indispensable, (ii) the refusal to license prevented the appearance of a new product for which there was potential consumer demand, (iii) there was no justification for such refusal, (iv) the refusal to license excluded all competition on

³²⁶ Ibid, pp. 1219-1220.

³²⁷ *Re Independent Service Organizations Antitrust Litigation*, 203 F.3d 1322 (Fed. Cir. 2000).

³²⁸ Ibid, pp. 1327-1328. The Court held that patents could entitle the patent holder to control secondary markets: in this case Xerox’s part patents enabled Xerox to control the market for service of Xerox copiers as well.

³²⁹ *Trinko* case (n 119), the Supreme Court noting “the few existing exceptions from the proposition that there is no duty to aid competitors”.

³³⁰ Case 53/87 *CICRA v Renault* [1988] ECR 6039; Case 238/87 *Volvo v Veng* [1988] ECR 6211.

³³¹ Case 53/87 *Renault*, (n 323) para 9

³³² Case T-51/89 *Tetra Pak* [1990] ECR II-309.

³³³ Case T-504/93 *Tiercé Ladbroke SA v. Commission* [1997] ECR II-923 (the objective of the French race courses was not to extent their monopoly in Belgium (leverage theory) but to protect their monopoly in the French market, which could be threatened if the Belgian companies were able to take bets for French races).

³³⁴ ECJ, Joined Cases C-241/91 and C-242/91, *Radio Telefís Eireann v Commission (Magill)*, ECR [1995] I-743.

the secondary market. By insisting on the requirement that the refusal to license prevented the sale of a new kind of product for which there was unsatisfied demand, the ECJ appeared to consider the necessity to protect innovation in the market. In *Magill*, the refusal to license had impeded the emergence of a new product, a composite TV guide, which the holders of the intellectual property right did not offer and for which there was a potential demand. The weak and questionable nature of the IP right that was involved in this case, a copyright protection granted on simple TV listings under a “sweet of the brow” standard, may explain the position of the Court, in particular as access to these data was indispensable for the emergence of the new product. The judgment was not also clear as to the cumulative or alternative character of these exceptional circumstances and some confusion resulted from a subsequent case of the General Court, which treated conditions (i) and (ii) of *Magill* as alternative rather than cumulative.³³⁵

In the meantime, the Court of Justice in *Oscar Bronner*, a case which did not involve a refusal to license but the refusal by a dominant firm to share its distribution network with a competitor, interpreted the four conditions of *Magill* as being cumulative and narrowed down the duty to deal doctrine in EU competition law, by interpreting the indispensability condition as requiring evidence from the undertaking requesting access that it should not be economically viable for an undertaking with a comparable size with the dominant firm to develop its own facility or input.³³⁶

In *IMS/NDC Health*,³³⁷ the ECJ reaffirmed the cumulative character of these conditions and explained that the “new product or service” rule limits the finding of abuse for a refusal to licence “only where the undertaking which requested the licence does not intend to limit itself essentially to duplicating the goods or services already offered on the secondary market by the owner of the copyright, but intends to produce new goods or services not offered by the owner of the right and for which there is a potential consumer demand”.³³⁸ In *Renault and Volvo*, both of which involved rights of design on spare parts, the exceptional circumstances were held to exist even if the refusal to license did not impede the emergence of a new product. The identification of two different but interconnected stages of production is also important, as it is only if the upstream products or services are an indispensable input for the supply of the downstream product that a refusal to licence may fall within the scope of article 102 TFEU. Yet, as the Court noted, it is sufficient to identify a captive, potential or hypothetical input market, for example by distinguishing between the different stages of the innovation process, the intellectual property right being one of them.³³⁹

In its recent Enforcement Priorities’ Guidance on exclusionary abuses,³⁴⁰ the Commission notes that it will consider unilateral or “constructive”³⁴¹ refusals to deal as an enforcement priority if *all* the following circumstances are present: (i) the refusal relates to a

³³⁵ Case T-504/93 *Tierce Ladbroke SA v Commission* [1995] ECR II-923.

³³⁶ Case C-7/97 *Oscar Bronner GmbH & Co KG v Mediaprint Zeitungs- und Zeitschriftenverlag GmbH & Co KG* [1998] ECR I-7791.

³³⁷ *IMS Health* case, paras 34-35.

³³⁸ *Ibid* para 49 (emphasis added).

³³⁹ *Ibid* paras 44-45.

³⁴⁰ Guidance Paper (n 247).

³⁴¹ For example, unduly delaying or otherwise degrading the supply of the product or imposing unreasonable conditions in return for the supply.

product or service that is objectively necessary to be able to compete effectively on a downstream market, (ii) the refusal is likely to lead to the elimination of effective competition on the downstream market, and (iii) the refusal is likely to lead to consumer harm.³⁴² As it becomes clear, the third condition did not exist as such in the case law of the EU courts. The Commission emphasizes the interest of consumers and indicates that it will examine the likely negative consequences of the refusal to supply in the relevant market outweigh over time the negative consequences of imposing an obligation to supply. Preventing innovation, in particular stifling follow-on (cumulative) innovation constitutes an example of possible consumer harm. The Guidance also takes a more liberal view of the condition of indispensability, as the fact that the licensee does not intend to limit herself essentially to duplicating the goods or services already offered on the secondary market is not the *only* instance in which cumulative innovation may be considered as likely to be stifled. The Commission adopts instead a wider interpretation of the restrictive effect on innovation. With regard to possible objective justifications, the Guidance recognizes two instances which may give rise to such claims by IPR holders: the need to allow the dominant undertaking to realize an adequate return on the investment required for the development of its input business and the need for the undertaking to generate incentives to invest in the future, taking the risk of failed projects into account.³⁴³ These efficiency gains should however be examined under the four conditions test for efficiencies, described below.

In contrast to US antitrust law, refusals to provide interoperability are assessed in the EU under the broader category of refusals to supply.³⁴⁴ The Commission applied Article 102 TFEU to the refusal by Microsoft to supply Sun Microsystems the necessary information to establish interoperability between their work group server operating systems and Microsoft's PC operating system Windows.³⁴⁵ Microsoft was ordered to disclose interoperability information in a reasonable, non-discriminatory and timeliness way. While the Commission did not contemplate compulsory disclosure of the source code of Windows and the disclosure measure only covered interface specifications, it acknowledged that "it cannot be excluded that ordering Microsoft to disclose such specifications and allow such use of them by third parties restricts the exercise of Microsoft's intellectual property rights".³⁴⁶ Microsoft's conduct was not necessarily impeding the emergence of an identifiable new product. Microsoft's conduct had nevertheless, according to the Commission, the effect of reducing the incentives of its competitors to innovate (and produce new products in the future) and therefore to limit consumer choice. The Commission affirmed that intellectual property rights cannot as such constitute a "self-evident objective justification" for Microsoft's refusal to supply and employed a balancing test examining if the possible negative impact of an order to supply on Microsoft's incentives to innovate could be outweighed by its positive impact on the level of innovation of the whole industry (including Microsoft). Taking the view that "Microsoft's research and development efforts are [...] spurred by the innovative steps its competitors take in the work group server operating" system market that "were such competitors to disappear, this would diminish Microsoft's incentives to innovate", the Commission concluded that the costs outweighed the benefits in this case.

³⁴² Ibid para 81.

³⁴³ Ibid para 89

³⁴⁴ Ibid., para 78.

³⁴⁵ Commission Decision Microsoft (n 228).

³⁴⁶ para 546 and para 1004

The General Court (at the time the Court of First Instance) confirmed the Commission's Microsoft decision in 2007.³⁴⁷ While it reaffirmed the four criteria of the ECJ in *Magill* and *NDC Health* it also adopted a more open-ended interpretation for some of these conditions. First, the Court used language that implied that these conditions were not the only exceptional circumstances in which the exercise of the exclusive right by the owner of the intellectual property rights may give rise to such an abuse, although it noted that the requirement "that the refusal prevents the appearance of a new product for which there is consumer demand is found only in the case-law on the exercise of an intellectual property right".³⁴⁸ Second, the Court gave also a broad interpretation to the "new product rule" of *IMS/NDC Health*, finding that consumer injury may arise where there is a limitation not only of production or markets, but also of technical development.³⁴⁹ Contrary to *Magill* and *IMS*, Microsoft's conduct did not impede the emergence of identifiable new products but affected the competitive process that would have brought about these new products in the future. Third, the Court interpreted "consumer harm" broadly noting that consumer choice would be affected if rival products of equal or better quality would not be able to compete on equal terms at the market.³⁵⁰

SUMMARY. There is a significant divergence between US antitrust law and EU competition law in the treatment of unilateral refusals to license. US antitrust law is relatively permissive for this type of conduct, even in the context of an entrenched dominant position. It is only in rare circumstances that an obligation to license has been imposed. Following the Supreme Court's judgment in *Trinko*, the emphasis is put on dynamic efficiency and the incentives of the dominant undertaking to invest and not on the allocative efficiency losses of monopoly pricing. On the contrary, in Europe, refusals to license may fall under Article 102 TFEU in "exceptional circumstances". The interpretation of the case law and in particular the decisional practice of the Commission and its soft law rule making activity indicate, however, that these "exceptional circumstances" have been expanded to cover an array of situations and that the conditions set by the ECJ in *IMS/NDC Health* do not effectively limit the scope of liability under Article 102 TFEU.

b. Anticompetitive abuses of the IP system

The value of an IP right, in particular a patent, lies in the fact that it can be enforced against infringers. However, dominant firms have been found in both US antitrust law and EU competition law to abuse the regulatory and litigation system with the aim to raise the costs of their rivals, exclude competition and ultimately harm consumers. The abuse may take the form of (i) a fraudulent litigation or some form of misrepresentation in the context of the regulatory process at the patent offices, (ii) or it might also consist in introducing litigation with the collateral purpose of imposing to the rival(s) an anticompetitive injury. In the context of patent litigation, this conduct may take the form of competition law (antitrust) counterclaims to patent infringement claims, what is generally referred to as "sham litigation" in the US or "vexatious litigation" in Europe.

³⁴⁷ Microsoft CFI case (n 118).

³⁴⁸ Ibid paras 332-334.

³⁴⁹ Ibid para 647.

³⁵⁰ Ibid para 652.

It is important here to note that what constitutes a restriction of competition in these cases is not the use of the regulatory or litigation process itself but the abuse of that process. The restriction of competition flows directly from a “private” action, as the injury would have happened no matter what the government official or judge would have decided. What is important is to establish criteria enabling the decision-maker to distinguish a legitimate use of the regulatory process or the courts from the abuse of these processes.

With regard to the first type of abusive conduct, the Supreme Court held in *Walker Process Equipment* that a defendant in a patent suit might bring an antitrust counterclaim where the allegedly infringed patent was obtained by fraud on the PTO.³⁵¹ He must show by clear and convincing evidence that there is some fraud or “inequitable conduct” from the patent holder. Not any misrepresentation from the patent holder in the patent application process is sufficient to make a patent unenforceable. The US courts require high standards for the proof of “inequitable conduct”: this includes a misrepresentation of a material fact, the falsity of that representation, the intent to deceive, a justifiable reliance upon the representation by the party deceived and a showing of “materiality”, that is injury to the party deceived *as result of* the misrepresentation (the patent examiner would not have issued the patent if the misrepresentation was not made).³⁵² The important question to ask, once the infringement action is filed is whether the infringement plaintiff knew or should have known that the action is improper. In addition to “fraud” or “inequitable conduct” element of the offense, which has been broadly interpreted,³⁵³ US courts require, as in all Section 2 Sherman Act cases, evidence that the conduct is reasonably capable of maintaining or extending monopoly power by impairing the opportunities of rivals.

In the EU, the Commission and the EU Courts may also apply Article 102 TFEU to fraudulent misrepresentations by a dominant undertaking to a Patent Office (during opposition and appeal procedures) or a national court (during patent litigation) in order to procure IP rights. For example, in 2005 the European Commission found *Astra Zeneca* guilty of having abused dominance by using its IPRs and the pharmaceutical regulatory system to prevent or delay the marketing of generic versions of its ulcer treatment drug, Losec.³⁵⁴ Astra Zeneca had submitted misleading information to national patent offices in order to acquire supplementary protection certificates (SPCs) which would extend the patent protection for Losec and then defending those in court. It had also misused national rules by launching a tablet form of the drug and withdrawing authorizations for the original version of its drug Losec in certain national markets where patents or SPCs were due to expire. The General Court upheld the decision of the Commission finding that the misleading nature of representations made to public authorities must be assessed on the basis of objective factors, proof of the deliberate nature of the conduct

³⁵¹ *Walker Process Equipment v Food Mach. & Chem Corp.*, 382 US 172 (1965).

³⁵² *Nobelpharma AB v Implant Innovations, Inc.*, 141 F.3d 1059 (Fed. Cir. 1998). For a critical analysis of this case law see, Herbert Hovenkamp, ‘The Walker Process Doctrine: Infringement Lawsuits as Antitrust Violations’ University of Iowa Legal Studies Research Paper No. 08-36 (1 September 2008) available at <<http://ssrn.com/abstract=1259877>> accessed 28 April 2013.

³⁵³ Hovenkamp, ‘The Walker Process Doctrine’ (n 345) 4, noting that “infringement actions can also be qualifying exclusionary practices [...] when they are based on valid patents that are known by the infringement plaintiff to be unenforceable as a result of improprieties in procurement, or on valid patents but where the infringement plaintiff knew or should have known that the infringement defendant was not an infringer” or “when the infringement plaintiff bases its cause of action on unreasonable and clearly incorrect interpretations of questions of law”.

³⁵⁴ 2006/857/EC: Commission Decision, *AstraZeneca* [2006] OJ L 332/24.

and of the bad faith of the undertaking in a dominant position not being required for the purposes of identifying an abuse of a dominant position.³⁵⁵ However, the ECJ found that intention was a relevant factor in the assessment of abuse in this case, the Court also emphasizing that dominant companies do not need to be “infallible” in their dealings with regulatory authorities and each objectively wrong representation will not necessarily be an abuse.³⁵⁶ As a result of this case dominant companies would not be considered to have engaged in abusive conduct simply because a patent application was struck down when challenged. Indeed, “innovative companies should not refrain from acquiring a comprehensive portfolio of intellectual property rights, nor should they refrain from enforcing them”.³⁵⁷

Competition authorities in Europe and the US have also found that the commencement of litigation may be abusive in limited circumstances. The reasons pushing the competition authorities to intervene against this type of conduct are not hard to imagine. First, litigation of IPRs is particularly significant in some economic sectors, such as the pharmaceutical industry, as originator companies use a variety of instruments to extend the commercial life of their medicine, including litigation.³⁵⁸ Second, litigation costs are important. The European Commission found in its recent *Pharmaceutical Sector Inquiry* that the average duration of opposition and appeal proceedings averages 2,8 years (from 6 months to 6 years in some Member States), litigated infringement proceedings could take about 7 years, the average duration of interim injunctions granted was 18 months and litigation costs are significant in view of the fact that patent infringers (in this case generics) face multiple actions in multiple states, given the absence of a unified EU patent system.³⁵⁹

“Sham” or “vexatious” litigation refers to the predatory use of adjudicative procedures to achieve anticompetitive goals. It is a typical case of non-price predation: the predator uses legal processes to impose expenses and delay, at little cost to itself. In the United States, an exception to Noerr-Pennington immunity³⁶⁰ exists where one uses the governmental process, rather than its outcome, as a sham to cover anticompetitive conduct.³⁶¹ In Europe, vexatious litigation may constitute an abuse of a dominant position, contrary to article 102 TFEU.³⁶² The key piece of evidence in identifying sham litigation is the absence of genuine interest in receiving judicial relief. Establishing the genuine motive of the plaintiff, therefore, has been the central issue to much of the case law on sham litigation in Europe and in the United States.

³⁵⁵ Case T-321/05, *Astra Zeneca v Commission* (n 204), para. 356.

³⁵⁶ Case C-457/10P, *Astra Zeneca v. Commission* (n 204).

³⁵⁷ *Ibid* para 188.

³⁵⁸ European Commission, Executive Summary of the Pharmaceutical Sector Inquiry Report (2009) (n 202), noting that “(t)he number of patent litigation cases between originator and generic companies increased by a factor of four between 2000 and 2007”.

³⁵⁹ European Commission, *Pharmaceutical Sector Inquiry – Final Report* (n 43), pp. 202-253 and 394-415.

³⁶⁰ Noerr-Pennington immunity holds that, efforts to influence public officials through lobbying, publicity, and other contact are protected by the petition clause and are not a violation of antitrust law even when the petitioning activity is undertaken for a disfavored motive, such as eliminating competition. See, e.g., *United Mine Workers v Pennington* 381 U.S. 657 (1965); *Eastern Railroad Presidents Conference v Noerr Motor Freight* 365 U.S. 127 (1961).

³⁶¹ *Walker Process Equipment v Food Machinery and Chemical Corp.* (1965) 382 US 172.

³⁶² Case T-111/96 *ITT Promedia NV v Commission* (1998) ECR II-2937.

In practice, courts adopt two different approaches to identify sham claims. Some took a narrow view and defined sham litigation as a pattern of baseless claims made without regard to their merits, and designed to delay and tie up the judicial process. Others based their assessment of the real motive of the plaintiff on a cost-benefit analysis of his economic interest to bring suit.

With regards to the first approach, the existence of a predatory intent is clearly demonstrated in situations of misrepresentations of facts or law to tribunals, perjury, fraud or bribery. However, the courts also consider as sham litigation actions that are manifestly unfounded or without probable cause. In assessing the existence of probable cause the courts examine the situation existing when the action in question was brought. Probable cause to institute civil proceedings requires no more than a reasonable belief that there is a chance that a claim may be held valid upon adjudication. This approach makes virtually conclusive the presumption that a successful suit cannot be a sham. It requires as a first step of the analysis of the claim of sham litigation by the courts, the proof that the lawsuit is objectively baseless, in the sense that no reasonable litigant could realistically expect success on the merits. However, there are important reasons to object to this test. Probable cause may be absent if the claim is not supported by the adequate factual evidence. It is also possible that a claim is considered baseless because of a misconceived interpretation of the law. However, in this some courts may consider baseless an action that other courts will consider meritorious. This risk is particularly present in situations in which the concept of what constitutes a baseless claim may be influenced by the court's conception of the adequate balance to achieve between allocative and dynamic efficiency. The establishment of a bright-line rule may lead to an important risk of false negatives. Furthermore, it might not be objectively reasonable to bring a lawsuit just because there is a probability of some success on the merits, no matter how insignificant the value of the claim might be.

The second approach is broader. The fact that the claim is not baseless does not preclude the finding that the use of litigation constitutes an antitrust violation. Rather, the existence of sham litigation is evaluated by a purely objective test focusing on the economic interest of the plaintiff to bring legal action. What counts is whether the suit's expected value to the plaintiff exceeds its costs. The economic test for sham litigation is essentially a predation test, as it requires the proof of a profit sacrifice, which cannot be recouped by the plaintiff at a later stage in the event his legal action is successful. The application of this test raises numerous questions. For instance, information with respect to relative legal merits of the opposing parties and the amount of recovery may be privately held. The parties must learn about each other before they can identify suitable settlement terms. This learning is difficult because of incentives to misrepresent private information. Further, economies of scale in legal services may prompt large or dominant firms to follow anticompetitive rent-seeking strategies. As a result, some anticompetitive rent-seeking cases may be wrongly identified as non-predatory. The forgoing leads us to the question as to what is a workable standard for establishing the existence of sham litigation. Unlike the vast literature on predatory pricing, economists have had little to say on the issue of predatory sham litigation. Economic literature has yet to produce an objective examination of the incentives for sham acts.

In US antitrust law, the Supreme Court has adopted a two parts test, combining an objective with a subjective approach: (i) the lawsuit must be objectively baseless, no reasonable

litigant could realistically expect success on the merits; (ii) only if the challenged litigation is objectively meritless may a court examine the litigant's subjective motivation (his bad faith).³⁶³ Thus, motive alone cannot make viable a Section 2 Sherman Act case for infringement or misappropriation of intellectual property simply because the IPR turns out to be invalid.³⁶⁴ Similarly, because of the additional subjective requirement, objective baselessness alone, although necessary, is not by itself a sufficient element of a competition law claim.³⁶⁵ It is not sufficient that the underlying claim is objectively baseless; the claimant (in the IP infringement case) must know or believe that it is. In EU competition law, the General Court found that bringing legal proceedings may constitute an abuse only in "exceptional circumstances", namely (i) where the action cannot reasonably be considered as an attempt to establish the rights of the undertaking concerned and would therefore serve only to "harass" the opposite party and (ii) the action is part of a plan whose aim is to eliminate competition.³⁶⁶ This test seems to be more geared towards the intent of the claimant than the US antitrust two parts test, yet focusing on an objective definition of that intent by inferring it from the absence of any other plausible explanation for the claim than a harassment strategy of the other party.

The application of these criteria in practice presents a number of difficulties, in particular with regard to the complex patent environment in certain industries (e.g. pharma). In the context of this industry, litigation almost always raises disputes on seemingly genuine or reasonable issues about infringement, sometimes involving secondary patents filed by the originator some years after the grant of a primary or base patent raising material issues as to the scope of the patent and the ability of the generic firms to invent around the claimed patent.³⁶⁷ Patent litigation in this area is also initiated in an important proportion by generics firms seeking declarations of non-infringement or declarations of invalidity, thus breaking with the "mould" envisaged by the test.³⁶⁸ It has also been noted that a dominant undertaking initiating the IP litigation would be required to show, as a defence to the antitrust counterclaim, that it believed at the time of initiating this litigation that it had good prospects of success, by disclosing privileged information the undertaking received from its counsel on the success of the litigation or internal documents on the perceived value of patent or IPR.³⁶⁹

SUMMARY. This area of interaction between competition law and IPRs still remains largely unexplored and involves some difficult compromises, as access to justice should be preserved, while competition in the marketplace preserved. The recent enforcement activity of the European Commission might offer an occasion to address some of the complex evidential challenges in this area of competition law.³⁷⁰

³⁶³ *Professional Real Estate Investors, Inc v Columbia Pictures Indus., Inc*, 508 U.S. 49 (1993).

³⁶⁴ *Ibid* para 66.

³⁶⁵ *Ibid* para 61-62.

³⁶⁶ Case T-111/96, *ITT Promedia NV v Commission* (1998) ECR II-2937, paras 55 and 57.

³⁶⁷ Simon Priddis and Simon Constantine, 'The Pharmaceutical Sector, Intellectual Property Rights, and Competition Law in Europe' in S. Anderman & A. Ezrachi (eds.), *Intellectual Property and Competition Law* (n 167) 241-275, 267.

³⁶⁸ *Ibid*

³⁶⁹ *Ibid* 268.

³⁷⁰ See, for instance the recent European Commission's investigation of the patent infringement claims of Laboratoires Servier against Apotex. European Commission Press Release, MEMO/09/322, available at <http://europa.eu/rapid/press-release_MEMO-09-322_en.htm> accessed 28 April 2013.

2. The “Innovation Commons”³⁷¹

In some key industries, such as semi-conductors, computer software, biotechnology, nanotechnology, electronics, amongst others, the fuzzy boundaries of individual IPRs, the development of complex products requiring a variety of inputs and complementary assets, the importance of litigation following up disputes over appropriability and the need to organize the sharing of benefits between the actors present at different stages of the innovation process, has led to the development of “innovation commons”, enabling the sharing of information protected by IPRs and avoiding the problem of blocking patents. When licenses from too many individual IP holders are required, firms might under invest in the commercialization of downstream technologies, thus impeding R&D activity by making it difficult for firms to operate without extensive licensing of complementary technologies. The fragmentation of IPRs may impede the development and commercialization of new products or may increase considerably their cost. Focusing on the biotechnology industry, Heller and Eisenberg have discussed the “tragedy of the anti-commons” that may arise when there are multiple gatekeepers, each of whom must grant permission before a resource can be used: when IPRs are fragmented, the resource is likely to be underused and thus innovation will be stifled.³⁷² There is empirical evidence of this “anti-commons” problem and the resulting fragmentation of IPRs in various industries. For example, Hall and Ziedonis have examined patenting in the semi-conductor industry and found that this was higher in the presence of a low concentration of patent rights among rival firms, that is, a situation of greater fragmentation of patent rights. These empirical studies indicate that firms attempt to defend themselves from the anti-commons problem by developing strategies of defensive patenting in order to strengthen their bargaining position, thus at the same time increasing the likelihood of a “tragedy of anti-commons”.³⁷³

Innovation commons may take different forms: those working within the framework of IPRs include patent pools and cross-licensing arrangements, blanket licensing, cooperative standard setting and settlement of IP related disputes. The management of common resources provides benefits in comparison to the organization of the activity within a firm, as it enables the public to benefit from communal development, but also competition. In certain circumstances it can be a superior alternative than individual IPRs, dealing with the problem of “excessive or misaligned” IPRs and the constitution of “patent thickets”. Patent thickets are particularly common in technology areas that are densely populated by patents having overlapping claims relating to similar technology³⁷⁴. This overlapping set of patent rights requires that those seeking to commercialise new technology obtain licenses from multiple patentees. This leads first to increased transaction costs associated with negotiating with multiple patent owners if a license is needed to avoid infringement. Second, producers may infringe patents inadvertently, because it is difficult to identify overlapping patents or because the patent boundaries are hard to determine

³⁷¹ Christina Bohannon and Herbert Hovenkamp, *Creation Without Restraint: Promoting Liberty and Rivalry in Innovation* (Oxford University Press 2012) 325.

³⁷² Michael A Heller and Rebecca S Eisenberg, ‘Can Patents Deter Innovations? The Anticommons in Biomedical Research’ (1989) 280 *Science* 1.

³⁷³ Bronwyn H Hall and Rosemarie H Ziedonis, ‘The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979-1995’ (2001) 32(1) *Rand Journal of Economics* 101.

³⁷⁴ Review of Intellectual Property and Growth, Patent Thickets, Licensing and Standards, available at <<http://www.ipo.gov.uk/ipreview-doc-aa.pdf>>, accessed 28 April 2013.

prior development of the invention. Third, inventors may face potential litigation from upstream firms that do not practice their patents and hence keep them in relative obscurity, thus increasing litigation costs. Fourth, when multiple patents cover complementary components of a technology, patentees may exclude each other from using the technology as produce will have to navigate a “thicket” of conflicting rights to use their invention. The risk of exclusion may be intensified if patent holders strategically engage in building thickets of patents in order to force innovators to share rents under cross licenses or to develop a patent portfolio for defensive purposes. Small and medium enterprises (SME) may also be at disadvantage than large incumbents disposing of strong patent portfolios, which may conclude between them cross-licensing arrangements excluding SMEs from entering markets.

Patent thickets may produce negative welfare effects. It is well known in economics that when firms with market power sell complementary goods, their combined price will typically be higher than if both were sold by a single monopolist. This phenomenon called double marginalization may be particularly acute in high technology fields. In high-tech fields where innovation is rapid and cumulative, a large number of patents may touch on the same new technology. Double marginalization can make the technology expensive to commercialize, harming downstream producers and consumers as well as the innovators the patent system was designed to reward. This complements problem may even become worse if the downstream firms using the various inputs truly require the IPRs controlled by the upstream firm to make their products. First, the downstream producer will have to pay royalties to multiple patent owners, leading to the increase of the total amount of royalties paid, leading to high royalty overcharges that act as a tax on new products incorporating the patented technology, thereby impeding rather than promoting innovation (royalty stacking)³⁷⁵. This issue is examined in more detail in a different part of the report. Second, it would have been possible for the downstream producer to invent around the blocking patents if that manufacturer were aware of the patent and disposed of the time to do so. However, the situation is different if the downstream producer becomes aware of the patent after the downstream product has been designed and placed into large-scale production. In this case, the manufacturer would have incurred asset specific investments for the use of the specific technology and would be in a far weaker negotiating position. The patent holder could thus seek far greater royalties, backed up with the threat that she may interrupt the productive activity of the manufacturer. The producer’s only options in this case would be either to negotiate in a weak bargaining position with the patent holder or go back and redesign the product, re-launch its production, solve any compatibility problems there might exist between the different versions of the product, activities that would impose a huge cost. Consequently, the downstream producer is highly susceptible to hold up by the patent holder (the hold-up problem). Hold out can also arise if the downstream producer needs multiple complementary IPRs which are procured in a sequenced fashion, but patent holders strategically delay the start of the negotiation and thus get the greatest surplus because of the increased bargaining power that would result from their position as the last bidding seller.³⁷⁶

³⁷⁵ Mark A. Lemley & Carl Shapiro ‘Patent Holdup and Royalty Stacking’ (2007) 85 Texas Law Review 1991, 1993.

³⁷⁶ Robert P Merges, ‘Contracting into Liability Rules: Intellectual property Rights and Collective Rights Organizations’ (1996) 84 California Law Review 1293.

A possible solution to the double marginalization problem is the vertical integration of the companies controlling complementary assets. Such a solution may however decrease competition more than what is necessary for the resolution of the problem and might be less optimal than a solution that enables firms to cooperate while maintaining some degree of competition between them. Alternatively, the undertakings controlling these assets may coordinate their activities in a cooperative setting that would enable them to deal with the complements and the hold-up problems by cross-licensing their IPRs. Any cooperation and cross-licensing would be superior to a world in which patent holders fail to cooperate. Such cooperation may however face obstacles with regard to competition law's sensitivity to the cooperation of undertakings that might be potential competitors in different circumstances. As a matter of public policy, coordination will certainly generate benefits to the parties, but one cannot assume that it will always be compatible with the public interest to promote competition and protect the consumers. We will examine the application of competition law in Europe and the US to the various coordination mechanisms put in place in order to deal with the complements and the hold-up problems.

a. Patent pools and cross licensing

Patent pools and cross-licensing arrangements constitute a natural solution to the complements problem.³⁷⁷ Under a patent pool, an entire group of patents is licensed in a package, either by one of the patent holders or by a new entity established for this purpose, offering a “one stop shop” to all members of the pool to have access to the desired patents. Patent pools also enable non-members to have access to the patented technology at a royalty rate established by the members of the pool. Patent pools go back a long time and in some cases their creation was initiated by the State³⁷⁸. In 1917, during the First World War, US aircraft manufacturers were asked by the US government to participate to a patent pool because ongoing litigation between the company established by the Wright brothers had led aircraft production to a stalemate³⁷⁹. Patent pools are often developed in conjunction with technological standards (e.g., the MPEG-2 video and DVD standards in the late 1990s).

When patents in a pool are complements, the pool can lower their combined price, reduce transaction costs by limiting the number of individual licensing agreements required to make use of the technology) and thus increase licensing revenues. Pools may also reduce costs by reducing the occurrence of infringement litigation. Patent pools may however also be used to eliminate competition between rival technologies and facilitate cartelization. Participants in a patent pool might be able to use it as an opportunity to exchange competitively sensitive information on prices, output, marketing strategies etc. While recognizing the benefits of patent pools, competition authorities at both sides of the Atlantic have subjected patent pools to competition

³⁷⁷ Cross-licensing arrangements take the form of bilateral agreements under which two firms license large blocks of their respective patents to one another so as to avoid infringement litigation. That removes the need of patent-by-patent licensing and reduces transaction costs. Patent pools intervene in situations in which a firm requires licenses to a small number of patents held by each of many firms.

³⁷⁸ On the first patent pool, see, Adam Mossof, ‘The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s’ (2011) 53 *Arizona Law Review* 165.

³⁷⁹ For an analysis of the emergence of patent pools, see Robert Merges, ‘Institutions for Intellectual Property Exchange: The Case of Patent Pools’, in (Rochelle Dreyfuss, ed.) *Intellectual Products: Novel Claims to Protection and Their Boundaries* (Oxford Univ. Press, 2001) 123.

law scrutiny, in particular with regard to their formation, the selection of the included technologies and their operation.

With regard to cross-licensing, the US Guidelines consider that when cross-licensing allows firms to combine complementary factors of production, such licensing can be precompetitive.³⁸⁰ The Agencies apply a rule of reason analysis to all cross-licensing arrangements, inquiring whether the restraint harms competition among entities that would have been actual or likely competitors in the absence of the license and whether the restraint is reasonably necessary to achieve precompetitive benefits that outweigh anticompetitive effects.³⁸¹ However, they take a different perspective when cross-licensing constitutes a method for collusion on price or output by downstream competitors: arrangements determined to be mechanisms of naked price fixing or market division are analyzed under the per se prohibition rule.³⁸² The Agencies consider that anticompetitive exclusion because of a cross-licensing arrangement is unlikely unless the parties to the arrangement collectively possess market power.³⁸³ The Guidelines' market share threshold and the number of technologies safe harbors apply in this context.

With regard to patent pools, both the US Licensing arrangements guidelines and the EU Transfer of Technology Guidelines distinguish between complement and substitute technologies. Two technologies are complements when they are both needed for the production of the product or for carrying out the process to which the technologies relate. Two technologies are substitute when either technology enables the downstream manufacturer to produce the product or carry out the process to which the technologies relate. Pools composed of pure substitute technologies are more likely to harm competition and social welfare than are pools of complementary technologies. A further distinction is made between essential and non-essential technologies. Pools which are only composed of essential technologies are always precompetitive. All essential technologies are by definition considered complementary as well. Pools with complementary non-essential technologies may raise some competition concerns and there should be pro-competitive reasons to include non-essential technologies to the pool. The US Agencies apply a rule of reason analysis to patent pools, with the exception of when the pool is a naked restraint to competition. Patent pools limiting competition among entities that would have been actual or likely potential competitors in a relevant market in the absence of the license have the greatest potential to restrict unreasonably competition. Vertical license restrictions may also harm competition if they foreclose access or raise the price of an important input or if they facilitate horizontal coordination. The US Agencies have completed their policy analysis of patent pools in the Guidelines with a number of favorable business review letters issued by the Department of Justice regarding an MPEG patent pool, two DVD patent pools and a patent platform arrangement involving five separate wireless communication 3G technologies. The FTC has also initiated some enforcement action against patent pool formed by Summit Technologies, Inc and VisX, INC, two firms present in the manufacture and marketing of lasers for vision correcting eye surgery. The FTC examined if the two alleged efficiencies of the patent

³⁸⁰ DOJ and FTC Guidelines (n 220) § 2.3.

³⁸¹ Ibid § 3.1.

³⁸² Ibid § 3.4.

³⁸³ Ibid § 5.5.

pool could have been achieved by significantly less restrictive means and the patent pool was dissolved following a settlement with the FTC³⁸⁴.

Categorizing technologies as being complements or substitutes is not an easy task as in some cases technologies may display characteristics of both. There is also some discussion over the essential or non-essential character of the technology, as different tests to define whether the patent is essential to a standard or technology have been put forward.³⁸⁵ Recent patent pools have all been limited to essential patents and provide for independent experts to determine which patents should be included on this basis as a competitive safeguard to ensure that patent pools will not produce any anticompetitive effects.

The EU Transfer of Technology Guidelines adopts a similar approach.³⁸⁶ Patent pools composed of essential technologies do not fall within the scope of Article 101(1) TFEU. The inclusion of substitute technologies brings the patent pools within the prohibition principle of Article 101(1) and it is highly unlikely that it will benefit from the legal exception of article 101(3) TFEU, at least not if the substitute technologies constitute a significant part of the pooled technology, even if parties remain free to grant individual licenses, as this is unlikely to occur. If complementary patents of a non-essential nature are included, article 101(1) becomes applicable because of collective bundling, yet article 101(3) may apply if the nature of the pooled technology is ambivalent (complementary in part, substitute in part) or it changed over time (from essential to non-essential). Market dominating pools are required to practice fair and non-discriminatory terms of licensing and they may not grant exclusive licenses.³⁸⁷ The EU Guidelines on transfer of technology also contain detailed analysis on the institutional framework governing the pool, noting that “(t)he way in which a technology pool is created, organized and operated can reduce the risk of it having the object or effect of restricting competition”.³⁸⁸ Open pools are considered more competition-compatible than pools set up by a limited group of technology owners. The involvement of independent experts to the creation and operation of the pool and for the consideration of whether or not a technology is essential also reduce the likelihood of the pool being found anticompetitive. The likelihood of sensitive information being exchanged in an oligopolistic setting and the competitive safeguards put in place to avoid this from happening are also examined by the Commission.

SUMMARY. Both US antitrust and EU competition law have adopted a flexible approach to patent pools and cross-licensing, thus facilitating the resolution of the complements and hold up problems that may arise in situation of patent thickets.

³⁸⁴ US DOJ and FTC, ‘Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition’ (April 2007) available at <http://www.ftc.gov/reports/innovation/P040101PromotingInnovationandCompetitionrpt0704.pdf> > last accessed 28 April 2013, pp.64-86.

³⁸⁵ One could distinguish between an “economic” test and a “technically essential” test.

³⁸⁶ As technology pools include more than two parties, the Block exemption Regulation 772/2004 on transfer of technology agreements does not apply. However, the Commission provides information on the analytical framework in its Guidelines on transfer of technology agreements.

³⁸⁷ Ibid para 226.

³⁸⁸ Ibid para 230-235.

b. Standard setting and other forms of technology sharing

Standard setting may take different forms: technical standards may be the consequence of regulatory intervention, cooperative standards may be established through voluntary standard setting organizations or *de facto* standards set by the market place may emerge following an intense competition between firms engaged in a winner-take-all standards war. One might think of Microsoft's Window operating system or the QWERTY keyboard layout as illustrations of the emergence of the latest type of standard, the firm's position as market leader enabling it to select the standard (protected by IPRs) and force rivals to obtain a license. Standards provide increased compatibility between different products, increased interoperability, thus enabling the launch of a network. The role of interface standards is particularly significant in communication technologies, such as cell phones, personal digital assistants, laptops. A standard implemented before the development of a patent thicket may alleviate some of the complements and hold up concerns related to patent thickets. At the same time, standardization may impose costs, as it locks in consumers to a legacy system, enables hold up in cases essential IPRs have not been declared prior the standard or may enable dominance by big players. The way the industry standard emerges is of particular importance in order to assess its effects on competition. A cooperative standard is likely to enable multiple firms to be active in the industry, while the development of a *de facto* standard may lead to a single, proprietary product, controlled by a dominant firm.

Cooperative standard setting involves collaboration between competitors in the context of a Standard Setting Organization (SSO). SSOs adopt IP-related rules so as to promote cooperation and the development of standards: disclosure rules require participants to the SSO to inform the SSO members of any IP rights they held on technologies; SSOs are also based on transparency rules enabling members to be kept informed of ongoing and finalized standardization work. Licensing rules ensure that all members have effective access to the standard on fair, reasonable and non-discriminatory terms (FRAND). As these rules engage actual or potential competitors, they may infringe, in certain circumstances, the provisions of Section 1 Sherman Act in US antitrust law or Article 101 TFEU in EU competition law.

In US law, antitrust liability has been found for participants in a standard setting process abusing of this process in order to exclude competitors from the market.³⁸⁹ Although, according to the Supreme Court, “an agreement on a product standard is, after all, implicitly an agreement not to manufacture, distribute, or purchase certain types of products”, US antitrust law has stayed clear from cooperative efforts that aim to set standards as long as the scope of the agreement is limited to standard setting and does not extend to distribution or pricing. Integration and risk sharing, even among competitors, has traditionally been classified as a joint venture agreement under US antitrust law, thus escaping per se prohibition.³⁹⁰ In the context of a standard setting organization, the aim of the agreement is not however to share risks but to mitigate a hold up

³⁸⁹ *Allied Tube & Conduit Corp. V Indian Head, Inc.*, 486 US 492 (1988) (noting that “private standard-setting associations have traditionally been objects of antitrust scrutiny” because of their potential use as a means for anticompetitive agreements among competitors); *American Society of mechanical Engineers v Hydrolevel Corp.*, 456 US 556 (1982).

³⁹⁰ See, our analysis below III.C.2.e.

situation, limiting the likelihood that blocking patents may jeopardize the development of a new technology.

The *ex-ante* negotiation of licensing terms by SSO participants may enter the radar of competition authorities, as competing firms will be acting jointly to negotiate licensing terms with each of the firms whose technology may be considered for inclusion on the SSO's standard. Sham negotiations "intended to cloak the true nature of a particular licensing agreement", are subject to the *per se* prohibition rule.³⁹¹ For example, any effort by the SSO members to negotiate a price fixing agreement will be *per se* illegal. Conduct such as multilateral *ex ante* licensing negotiations or SSO requirements for intellectual property holders to disclose their intended licensing terms for technologies being considered for adoption in a standard, taking place before any decision is reached on which technology to include in a standard, will however be examined under the rule of reason standard.³⁹²

A series of cases has brought to the attention of competition authorities in the US deceptive conduct by a participant in the context of a SSO. In *re Dell*, the FTC examined deceptive conduct by Dell, which had omitted to disclose the IPRs held by Dell, prior to the adoption of a standard by the Video Electronics Standards Association. Once this standard has been adopted, Dell informed all the other participants that their implementation of the standard violated its exclusive right. The FTC entered into a consent agreement impeding Dell from using the patent against those implementing the standard.³⁹³ In *Unocal*, the Union Oil Company of California had also deceptively declared in the context of the SSO's rulemaking proceedings prior to the adoption of the standard that it had no proprietary rights on technologies included in the standard, before claiming once the technology has been implemented and other oil refiners had modified their refineries to comply with the standard the infringement of its patents and the collection of royalties. The FTC successfully challenged this practice and Unocal agreed to settle in not enforcing the patents relating to the standards.³⁹⁴ As some of these cases are related to FRAND terms related litigation, we will examine this further in the following section.

Turning to Europe, the recently adopted Guidelines on the applicability of Article 101 TFEU on horizontal cooperation agreements contain detailed guidance on standardization agreements.³⁹⁵ The Commission examines the effect of the standard-setting process on different markets: (i) the product or the service market to which the standard relates, (ii) if the standard setting involves the selection of technology and the rights to IP are marketed separately from the products to which they relate, the impact on the relevant technology market, (iii) on the market for standard-setting, if different standard-setting arrangements exist, (iv) on a distinct market for

³⁹¹ DOJ and FTC Guidelines on licensing arrangements (n 220) §3.4., example 7.

³⁹² See, US DOJ and FTC, 'Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition' (April 2007) available at <<http://www.ftc.gov/reports/innovation/P040101PromotingInnovationandCompetitionrpt0704.pdf>> last accessed 28 April 2013, pp. 33-56

³⁹³ *Re Dell*, 121 FTC 616 (1996).

³⁹⁴ *Re Union Oil Co. of California*, 2004 FTC LEXIS 115 (July 7, 2004); See also, *re Rambus, Inc.*, Dkt. No. 9302, 2006 FTC LEXIS 101 (Aug. 20, 2006), which will be discussed further below.

³⁹⁵ Communication from the Commission – Guidelines on the applicability of Article 101 TFEU to horizontal co-operation agreements, [2011] C 11/1, Part 7.

testing and certification that may be affected by the standard-setting.³⁹⁶ The Commission recognizes that standardization may produce significant positive effects as it encourages the development of new and improved products or markets, but in certain circumstances they might restrict price competition and limit to control production and the level of innovation and technical development, in particular by facilitating collusion or by excluding innovative technologies and foreclosing the market. The analysis is even more complicated in the context of standard-setting involving IPRs as there are multiple actors involved: (i) Companies that are only operating upstream and do not engage in manufacturing. These “non-practising entities” may hold patents essential to a standard, their only source of income being licensing. (ii) Downstream-only companies are solely present at the manufacturing level and do not hold IPRs, their production being based on technologies developed by others. (iii) Finally, vertically integrated companies that both develop technologies and sell products. In negotiations between non-practising entities and vertically integrated companies, the former ones have the upper hand, as the vertically integrated companies may not offer to cross-license their own IPRs. This can lead to situations of patent abuse and excessive royalties, as we will examine further in the report.

The possible anticompetitive effects notwithstanding, the Commission recognizes that there is no presumption that holding or exercising IPRs essential to a standard equates to the possession or exercise of market power. Effects on competition are assessed on a case-by-case basis. As it is also the case with US antitrust authorities, the Commission considers that using the disclosure rules of the SSO prior to the adoption of the standard to cover jointly fixed prices of either downstream products or of substitute technologies constitutes a restriction of competition by object under Article 101(1). All other arrangements may not be subject to Article 101(1), unless there are demonstrable anticompetitive effects. According to the Commission, “(w)here participation in standard-setting is unrestricted and the procedure for adopting the standard in question is transparent, standardization agreements which contain no obligation to comply with the standard and provide access to the standard on fair, reasonable and non-discriminatory terms will normally not restrict competition within the meaning of Article 101(1)”.³⁹⁷ The Commission acknowledges the need for the SSO to have transparent participation rules and procedures,³⁹⁸ good faith disclosure rules³⁹⁹ and notes that the SSO’s IPR policy “would need to require participants to have their IPR included in the standard to provide an irrevocable commitment in writing to offer to license their essential IPR to all third parties on fair, reasonable and non-discriminatory terms (“FRAND commitment”)” that “should be given prior to the adoption of the standard”.⁴⁰⁰ Furthermore, any exclusion by the participants of specified technology from the commitment to offer to license should be done at an early stage of the development of the standard. If participation to the standard-setting process is open equal access is ensured, allowing all competitors and/or stakeholders in the market affected by the standard to take part in choosing and elaborating a standard, the risks of a likely restrictive effect on competition will be low.⁴⁰¹ Similarly, competition between many SSOs or standard-setting processes in the industry

³⁹⁶ Ibid para 261.

³⁹⁷ Ibid para 280.

³⁹⁸ Ibid para 280 & 282.

³⁹⁹ Ibid para 286.

⁴⁰⁰ Ibid para 285.

⁴⁰¹ Ibid para 295.

will exclude the likelihood of the finding of anticompetitive effects. As it is clearly indicated by the Commission, the analysis should focus on the effects on the market and for this reason the market shares of the goods or services based on the standard will be taken into account.⁴⁰² Usually market shares of more than 20% may lead to a more intense scrutiny of the SSO's arrangements. In the worst-case scenario, if anticompetitive effects are identified, article 101(3) may come into play. The Commission recognizes that standardization frequently gives rise to significant efficiency gains. With regard to the pass-on to consumers requirement of Article 101(3), the analysis will focus on "which procedures are used to guarantee that the interests of the users of standards and end consumers are protected", the Commission noting that "(w)here standards facilitate technical interoperability and compatibility of competition between new and already existing products, services and processes, it can be *presumed* that the standard will benefit consumers".⁴⁰³ Presumptions may thus avoid a quite difficult and complex examination of the trade-off between allocative and dynamic efficiency in this context. When, however, standard-setting leads to a *de facto* industry standard, Article 101(3) may not enter into play if affords the parties the possibility to substantially eliminating competition.⁴⁰⁴

SUMMARY. Both US antitrust law and EU competition law offer a high degree of flexibility to voluntary standard-setting processes as long as basic rules of transparency, good faith disclosure, or a requirement to commit to license on FRAND terms are implemented.

c. (F)RAND licensing obligations

As we have previously explained, once a standard is adopted, it is impossible to manufacture products compliant with the standard without infringing the IPRs covering that standard. Hence, once a patented technology is incorporated as an essential part of a standard, the industry gets locked in this standard as switching to an alternative technology may be particularly costly. The holder of a standard essential patent is able to seek a court injunction to block companies from producing any products compliant with the standard and to ask for higher royalties than what he would have asked prior to the adoption of the standard. The infringers would have in this case to remove their infringing products from the market and no other choice than to accept licensing terms that they would not have accepted otherwise (a hold up situation). The issue may arise even if the standard essential patent holders have made a commitment to license in (F)RAND terms.⁴⁰⁵ An often related issue is what constitutes (F)RAND. This is an issue we will examine in more detail when analyzing the application of competition law to pricing conduct. However, even in presence of (F)RAND licensing the level of royalties required may be higher than otherwise would be the case, in particular if the standard essential patents (SEP) are owned by upstream companies that are not active in both R&D and the supply of products or services (the so called "non-practising entities"). These may sometimes contribute to the R&D effort upstream (e.g. universities and companies actively investing in R&D but choosing a licensing IPRs business model) but also "patent trolls", companies that do not

⁴⁰² Ibid para 296.

⁴⁰³ Ibid para 321(emphasis added).

⁴⁰⁴ Ibid para 324.

⁴⁰⁵ In Europe, the term Fair and Reasonable Non-Discriminatory Prices is used. In the US, the term RAND (Reasonable and Non Discriminatory terms) is preferred, as US antitrust law does not deal with exploitative practices and hence "fair" prices. See our analysis below.

contribute to R&D and product development but instead purchasing companies with large patent portfolios, then waiting until an industry is locked into a SEP they own and then taxing the industry participants with substantial royalty demands. The risk of hold up is particularly important in complex technically markets in which detailed standards have been developed cooperatively by many companies. As it was explained below, non-practising entities are not constrained by the need to guarantee cross-licensing arrangements, as most vertically integrated companies active in the supply of goods and services do: they can ask for injunctive relief against other companies knowing that they are not exposed to the risk of being subject to similar actions. For similar reasons they do not fear that SSOs may be reluctant to accept in the future their technologies, as they are not active inventors in the specific industry. Hence, in a case opposing NTP, a non-practising entity holding SEP in wireless email technology and Research In Motion (RIM), the manufacturer of blackberry, NTP's threat of an injunction ceasing the operation of all Blackberry services by RIM led the later to agree to settle for a sum of \$612,5 million.

Since the *eBay* judgment of the US Supreme Court, it is much more difficult for non-practising entities to obtain injunctions in patent infringement cases. However, in Europe, such constraints in the use of permanent injunctions do not exist yet and although damages are less significant, the availability of injunctive relief may enhance the bargaining power of non-practising entities and ensure high rents from settlements.

Both US antitrust and EU competition law have touched upon conduct relating to (F)RAND licensing and standard essential patents. We have already examined below the enforcement of Section 1 Sherman Act and Article 101 TFEU. It is clear from the EU Guidelines on horizontal cooperation agreements that patents declared essential to a standard must be made available on all interested parties in FRAND terms.⁴⁰⁶ Unilateral conduct may also fall within the scope of competition law, most usually Article 102 TFEU in Europe and Section 5 of the FTC Act in the US. As it has been recognized by the European Commission, "abuse of the market power gained by virtue of IPRs included in the standard constitutes an infringement of Article 102 TFEU".⁴⁰⁷

Some of the examined conduct relates to the transferability of the (F)RAND commitment from the companies engaged in the standard-setting process to the non-practising entities that acquired these patents, following a merger and acquisition process or other transaction. In *N-Data*, Negotiated Data Solutions, a non-practising entity obtained certain patents essential to an Ethernet standard developed by the IEEE. N-Data's predecessor had committed to license its technology for a one off fee of \$1000 per license, as a result of which the technology was included in the standard and the industry committed to the standard. Although N-Data had made the acquisition in full knowledge of this commitment of the previous owner, it demanded royalties far in excess of \$1000 per license. The FTC alleged that N-Data's conduct was an unfair practice under Section 5 of the FTC Act harming consumers and N-Data agreed to a consent order, which required it to change its licensing terms so as to bring them in conformity

⁴⁰⁶ Communication from the Commission – Guidelines on the applicability of Article 101 TFEU to horizontal co-operation agreements (n 382) paras 282-283.

⁴⁰⁷ Ibid para 284.

with the commitment of the original patent holder.⁴⁰⁸ It is noteworthy that the broad interpretation of Section 5 of the FTC Act in this case may be considered as limited by the requirements that (i) the conduct is coercive or oppressive (here it was assumed that the patent hold-up was inherently “coercive” and “oppressive” with respect to firms that are, as a practical matter, locked into a standard) (ii) there is an adverse effect on competition (here the alleged effect was on prices and the integrity of the standard setting-process); and (iii) the injured parties are unable to defend themselves.⁴⁰⁹

The European Commission has also taken position as to the transferability of the FRAND commitment in its Horizontal Cooperation Guidelines providing that “to ensure the effectiveness of the FRAND commitment there would also need to be requirement of all participating IPR holders who provide such a commitment to ensure that any company to which the IPR owner transfers its IPR (including the right to license that IPR) is bound by that commitment, for example through a contractual clause between buyer and seller”.⁴¹⁰

The litigation strategies employed in the context of SEP have also been examined in the two recent investigations in the US and in Europe. In the US, the FTC has recently concluded a settlement with Google with regard to the conduct of Google’s subsidiary Motorola to renege on its licensing commitment before its acquisition by Google made to several standard-setting bodies to license its SEP relating to smartphones, tablet computers and video game systems on RAND terms by seeking injunctions against willing licensees of those SEPs. Google had acquired Motorola Mobility (MMI) in 2012 including MMI’s patent portfolio of over 24000 patents and patent applications with a number of patents essential to industry standards used to provide wireless connectivity and for internet-related technologies (e.g. smartphones, gaming systems, operating systems, devices offering wireless connectivity or high definition video). The FTC found that the conduct tended to affect competition in these electronic devices markets and was in violation to Section 5 of the FTC Act. FTC’s settlement requires Google to withdraw its claims for injunctive relief on RAND-encumbered SEP’s around the world in the future. According to the FTC, the proposed settlement “may set a template for the resolution of SEP licensing disputes across many industries and reduce the costly and inefficient need for companies to amass patents for purely defensive purpose in industries where standard-compliant products are the norm”.⁴¹¹

In Europe, the Commission approved the merger between Google and Motorola in 2012. In response to Google’s argument that the new entity would not have the ability to significantly

⁴⁰⁸ *In re Negotiated Data Solutions LLC*, FTC File No. 051-0094, Decision and Order (Jan. 23, 2008), available at <<http://www.ftc.gov/os/caselist/0510094/080122do.pdf>> (note the dissenting statements of Deborah Platt Majoras and Bill Kovacic; see also, *In re Robert Bosch GmbH*, FTC File N. 121-0081, Decision and Order (Nov. 26, 2012), available at <<http://www.ftc.gov/os/caselist/1210081/121126boschdo.pdf>> accessed 29 April 2013.

⁴⁰⁹ See, Analysis of Proposed Consent Order To Aid Public Comment at 4-6, *In re Negotiated Data Solutions LLC*, File No. 0510094 (Jan. 23, 2008), available at <<http://www.ftc.gov/os/caselist/0510094/080122analysis.pdf>> accessed 29 April 2013.

⁴¹⁰ Communication from the Commission – Guidelines on the applicability of Article 101 TFEU to horizontal co-operation agreements (n 382) para. 285.

⁴¹¹ *In re Google Inc.*, FTC File No. 121-0120 (January 3, 2013), available at <<http://www.ftc.gov/os/caselist/1210120/130103googlemotorolastmtofcomm.pdf>> Statement of the Federal Trade Commission.

impede effective competition post-merger, as it will be constrained by the FRAND commitment which has been given by Motorola Mobility, the Commission noted that FRAND commitments “cannot be considered as a guarantee that a SEP holder will not abuse its market power”.⁴¹² According to the Commission, a SEP holder can certainly threaten to seek or seek injunctions at any time and nothing ensures that a national court in question may grant an injunction without a detailed examination of whether FRAND and Article 102 TFEU have been respected, leaving the SEP holder free to enforce the injunction.⁴¹³ The Commission noted that “the threat of injunction, the seeking of an injunction or indeed the actual enforcement of an injunction granted against a good faith potential licensee, may significantly impede effective competition by, for example, forcing the potential licensee into agreeing to potentially onerous licensing terms which it would otherwise not have agreed to”.⁴¹⁴ Commenting on this decision, Damien Geradin argues that “the Commission takes a prudent position” as “while it does not suggest that patent holders who have made a FRAND commitment should *always* be prohibited from seeking injunctions (which would be an excessive position), it recognizes that *there may be circumstances* where the seeking of an injunction may be abusive, especially when such injunctions are used to coerce “good faith” licensees to accept licensing terms that it would not accept but for the injunction”.⁴¹⁵ The approach followed by the Commission raises the issue of identifying what makes someone a “willing” (good faith) licensee, an issue that was also raised in the US cases.

The Commission has recently opened investigations against two SEP holders active in the mobile device industry (Samsung Electronics and Google MMI) alleging that by seeking and enforcing injunctions in various Member States’ courts against competing manufacturers based on alleged infringement of certain SEPs, the companies have failed to honor their irrevocable commitments to license any SEP on FRAND terms, that behavior being an abuse of a dominant position.⁴¹⁶ These cases may offer the European Commission the opportunity to elucidate its position with regard to the availability of injunctive relief for SEP holders in the case of willing licensees and provide a more detailed definition of the latter category.

SUMMARY. Competition law authorities in Europe and the US have recently intervened to control behavior adopted in the context of SSOs and in negotiations between standard essential patent holders and potential licensees outside the standard-setting environment. The trend at both sides of the Atlantic is to limit the right of SEP holders to use injunctive relief and reverse commitments to license in (F)RAND terms taken previously by the original SEP holders. The availability of injunctive relief in this context has already been curtailed in the US, with the recent judgment of the Supreme Court in *eBay* and the recent actions of the FTC in the

⁴¹² European Commission, Case No COMP/M.6381, Google/Motorola Mobility (February 13, 2012), available at <http://ec.europa.eu/competition/mergers/cases/decisions/m6381_20120213_20310_2277480_EN.pdf> accessed 29 April 2013.

⁴¹³ Ibid para 113.

⁴¹⁴ Ibid para 107.

⁴¹⁵ Damien Geradin, “Ten Years of DG Competition Effort to Provide Guidance on the Application of Competition Rules to the Licensing of Standard-Essential Patents: Where Do We Stand?” (21 January 2013), available at SSRN: <<http://ssrn.com/abstract=2204359>> or <<http://dx.doi.org/10.2139/ssrn.2204359>> accessed 29 April 2013.

⁴¹⁶ European Commission, Commission opens proceedings against Samsung, IP/12/89 (January 31, 2012), available http://europa.eu/rapid/press-release_IP-12-89_en.htm; European Commission, Commission opens proceedings against Motorola, IP/12/345 (April 3, 2012), available at <http://europa.eu/rapid/press-release_IP-12-345_en.htm> accessed 29 April 2013/

enforcement of Section 5 of the FTC Act. In Europe, the recent investigations of the European Commission in the enforcement of Article 102 TFEU signal that a similar move will take place.

d. Price fixing and horizontal market restraints

Horizontal price fixing or naked agreements seeking to divide the market or to impose output restrictions between competing intellectual property owners are prohibited by both Section 1 Sherman Act and Article 101 TFEU. Agreements between competitors that restrict licensing or that give to one competitor the right to veto another's strategic licensing decisions as to pricing, output, innovation will likewise be treated as a *per se* violation of Section 1 of the Sherman Act.⁴¹⁷ In Europe, such restrictions are explicitly excluded from the benefit of the block exemption regulation and it is highly unlikely that they might be justified under Article 101(3) TFEU.⁴¹⁸

e. Joint ventures

A distinction should be made between horizontal cooperation agreements that constitute joint ventures, which are analyzed under the rule of reason and horizontal price fixing or naked output restrictions that are subject to the principle of *per se* prohibition.⁴¹⁹ To determine whether a particular restraint in a licensing arrangement is given *per se* or rule of reason treatment, the US Agencies examine whether the restraint in question can be expected to contribute to an efficiency-enhancing integration of economic activity. Any restraint in a licensing arrangement that may further the combination of the licensor's intellectual property with complementary factors of production owned by the licensee by, for example, aligning the incentives of the licensor and the licensees to promote the development and marketing of the licensed technology, or by substantially reducing transactions costs should be analyzed under a rule of reason standard. For example, price restraints that limit the independent pricing of the members of the joint venture may be subject to a quick look rule of reason approach when they are reasonably necessary in order to achieve the efficiency-enhancing integration of economic activity.⁴²⁰

In some cases, restrictions may be necessary in order to achieve important transactional efficiency benefits. A classic example is collecting societies. In *BMI* the US Supreme Court held that the blanket licenses issued and priced by the music performing rights organizations ASCAP and BMI were not subject to *per se* prohibition under Section 1 of the Sherman Act because: (i) they allowed for new, integrated products "entirely different from the product that any one composer was able to sell by himself", (ii) they generated substantial transaction-cost savings and (iii) they were a practical necessity if songwriters were to be paid for the use of their compositions.⁴²¹ The *BMI* approach enables horizontal cooperation arrangements that bring substantial efficiency gains to escape prohibition. EU Competition law is also relatively lenient

⁴¹⁷ US DOJ and FTC, Guidelines on Licensing arrangements (n 220) § 3.4.

⁴¹⁸ EU Guidelines on Transfer of Technology Agreements, (n 106) Article 4.

⁴¹⁹ US DOJ and FTC, Guidelines on Licensing arrangements (n 220) § 3.4.

⁴²⁰ *Texaco, Inc. v Dagher*, 547 US 1 (2006).

⁴²¹ *Broadcast Music, Inc. v Columbia Broadcast. System, Inc.*, 441 US 1 (1979).

to cooperative joint ventures for production or sales with efficiency gains.⁴²² The EU Courts have also recognized the important transactional benefits of collecting societies,⁴²³ although there is recently some skepticism over the indispensability of the restrictions of competition inherent in a collecting society, as individual exploitation using digital rights management systems (DRMs) may technically replace collective administration through collecting societies.⁴²⁴

SUMMARY. Joint ventures may escape prohibition in both US and EU competition law when they allow for efficiency-enhancing integration of assets, in the absence of a naked or hardcore restriction to competition (e.g. cartels).

3. Tying and Interoperability

Bundling may take different forms: pure bundling, tying arrangements where some of the goods contained in the package are offered on their own (tied product) whereas others are not available individually (tying products), or mixed bundling, which refers to the practice of selling each product as part of a package, as well as individually but to be interesting for consumers the bundle price must be lower than the sum of individual prices. In EU competition law tying arrangements may fall under Articles 101 and 102 TFEU. In US antitrust law they may be analyzed under Section 1 and 2 of the Sherman Act, Section 3 of the Clayton Act or Section 5 of the FTC Act. In addition, tying may establish a basis for a copyright or patent misuse claim. Intellectual property tying claims may take different forms: (i) the tying of a patented device with an unpatented component or when the licensing of one technology is conditional upon the licensee purchasing a product, (ii) technological tying resulting from product design changes with the aim to combine functionalities between a patented product with an unpatented one, (iii) bundled or package licensing which bundles an unwanted IPR to another IPR that the licensee desires, the classic example being block booking of motion pictures, (iv) the bundling of licensing a specific IPR with franchising. We will focus on patent ties, technological tying and package licensing.

a. Patent ties

Tying is a relatively frequent claim related to IP licensing and has been particularly important for the development of the interaction between competition law and IP rights, the first antitrust cases dealing with IP rights involving tying claims of patented with unpatented goods and raising the question of the extent of the right of the IP owner to exploit its IPR. Following the Supreme Court's judgment in *Jefferson Parish Hospital*, tying was subject to a peculiar quasi-per se illegality analysis, as the plaintiffs were required to meet four elements to prove a violation of Section 1, among which (i) the existence of two separate products, (ii) evidence of

⁴²² See, European Commission, Guidelines on Horizontal Cooperation Agreements (n 382), paras 150-194 (production joint ventures), paras 225-256 (in particular para. 255 for joint ventures on sales).

⁴²³ Case 395/87, *Ministère public v Jean-Louis Tournier* [1989] ECR 2521.

⁴²⁴ Case COMP/C2/38.698 — CISAC (July 16, 2008), available at <http://ec.europa.eu/competition/antitrust/cases/dec_docs/38698/38698_4567_1.pdf> (The Commission took the view that a series of measures, including membership and territorial restrictions incorporated in the reciprocal representation agreements concluded between the collecting societies infringed Article 101 TFEU). The Commission's decision was recently partially annulled by the General Court: see Case T-442/08 *International Confederation of Societies of Authors and Composers (CISAC)* (12 April 2013).

coercion and (iii) proof that the seller has sufficient economic power in the market for the tying product to enable it to restrain trade in the market for the tied product (a market share of less than 30% in the tying product market was considered insufficient to establish market power).⁴²⁵ In *Illinois Tool Works*, the Supreme Court acknowledged that the “this Court’s strong disapproval of tying arrangement by the case law has substantially diminished” and stressed the need to prove market power, for tying to be considered anticompetitive.⁴²⁶ The Court also noted that a patent does not necessarily confer market power on the patentee, thus breaking with a long tradition of precedents that had made that presumption. The 1995 DOJ and FTC Guidelines on Licensing arrangements move to a rule of reason analysis of intellectual property tying arrangements noting that “(a)lthough tying arrangements may result in anticompetitive effects such arrangements can also result in significant efficiencies and procompetitive benefits”.⁴²⁷ According to the Guidelines, agencies are likely to challenge a tying arrangement if (i) the seller has market power in the tying product, (ii) the arrangement has an adverse effect on competition and (iii) efficiency justifications for the arrangement do not outweigh the anticompetitive effects.⁴²⁸ The Guidelines seem to focus less on evidence of the existence of two separate products.

In EU competition law, for a tying claim to exist “it is a condition that the products and technologies involved are distinct in the sense that there is distinct demand for each of the products and technologies forming part of the tie or the bundle”.⁴²⁹ As it is noted in the Commission’s Transfer of Technology Guidelines, “(t)his is normally not the case where the technologies or products are by necessity linked in such a way that the licensed technology cannot be exploited without the tied product or both parts of the bundle cannot be exploited without the other”.⁴³⁰ Tying arrangements escape Article 101 TFEU if the market share of the parties is below the threshold of 20% for agreements between competitors and 30% for agreements between non-competitors, which apply “to any relevant technology or product market affected by the licence agreement, including the market for the tied product”.⁴³¹ Above these market share thresholds the Commission will balance the anti-competitive and pro-competitive effects of tying. Among the efficiency gains considered, the Commission notes instances in which tying is necessary for a technically satisfactory exploitation of the licensed technology, for ensuring conformity to quality standards, for allowing the licensee to exploit the licensed technology significantly more efficiently, or when the licensor has a legitimate interest in ensuring that the quality of the products are such that it does not undermine the value of his technology or his reputation as an economic operator.⁴³²

Contractual tying may fall under the scope of Article 102 TFEU. Article 102(d) cites tying as an example of abuse: “making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial

⁴²⁵ *Jefferson Parish Hospital District No 2 v. Hyde*, 466 U.S. 2, 16 (1984). The fourth element is that a non insubstantial amount of interstate commerce in the tied product is affected.

⁴²⁶ *Illinois Tool Works v Independent Ink*, 126 S.Ct 1281 (2006).

⁴²⁷ US DOJ and FTC, Guidelines on Licensing arrangements (n 220) § 5.3.

⁴²⁸ *Ibid.*

⁴²⁹ European Commission, Guidelines on Transfer of Technology (n 106) para. 191.

⁴³⁰ *Ibid*

⁴³¹ *Ibid* para 192.

⁴³² *Ibid* paras 194-195.

usage, have no connection with the subject of such contracts”. The implementation of this article requires the difficult task of identifying anticompetitive (affecting consumers) forced package sales, while tolerating those that are not anticompetitive.

In *Tetra Pak II* the Court of Justice found that even where tied sales of two products are in accordance with commercial usage or there is a natural link between the two products in question, such sales may still constitute abuse within the meaning of Article 102 unless they are objectively justified, thus adopting a quasi-per se illegality standard to the contractual bundling by a dominant firm of two distinct products. The Court adopted a supply-oriented test for defining the condition of two distinct products by noting that for a considerable time there have been independent manufacturers for the tied product and inferring from that that the two products are distinct. The Court also announced the principle that “(a)ny independent producer is quite free, as far as [EU] competition law is concerned, to manufacture consumables intended for use in equipment manufactured by others, unless in doing so infringes a competitor’s intellectual property right”.⁴³³ In *CBET*, the Court of Justice held that an abuse is committed where, without any objective necessity, an undertaking holding a dominant position on a particular market reserves to itself or to an undertaking belonging to the same group an ancillary activity which might be carried out by another undertaking as part of its activities on a neighbouring but separate market, with the possibility of eliminating all competition from such undertaking.⁴³⁴

This restrictive approach of the EU Courts for contractual tying may have been transformed to a form of structured rule of reason analysis in the recent judgment of the General Court in *Microsoft*, although this case concerns technological tying.⁴³⁵ The Commission’s Priorities Guidance do not refer to the condition of coercion found in the case law and note that Article 102 may apply where an undertaking is dominant in the tying market and where, in addition, (i) the tying and tied products are distinct products and (ii) the tying practice is likely to lead to anticompetitive foreclosure.⁴³⁶ The condition of the distinct products is also interpreted more broadly, the Commission considering that “the presence on the market of undertakings specialised in the manufacture or sale of the tied product without the tying product or each of the products bundled by the dominant firm” constitutes *indirect evidence* (not direct as it was suggested in the previous case law of the Court) of the distinct character of the products.⁴³⁷

b. Technological tying

Technological integration or tying has been an area of continuous debate, in view of the trend to integrate multiple functionalities in products in high technology markets. Product design changes and technological integration may give rise to antitrust liability in US antitrust law. In *C.R. Bard, Inc. v. M3 Systems*, the Federal Circuit found improper the modification by Bard of the product design of its biopsy gun in order to prevent its competitor’s copycat replacement needles from being used in the guns.⁴³⁸ In *Microsoft II*, the Court of Appeals for the Federal

⁴³³ Case C-333/94 P, *Tetra Pak v Commission* (Tetra Pak II) [1996] ECR I-5991.

⁴³⁴ Case 311/84, *CBET v. Compagnie Luxembourgeoise de Télédiffusion SA* [1985] ECR 3261

⁴³⁵ Microsoft CFI case.

⁴³⁶ European Commission, Priorities Guidance (n 241) para 50.

⁴³⁷ Ibid para 51.

⁴³⁸ *C.R. Bard, Inc. v M3 Systems*, 157 F.3d 1340 (Fed. Cir. 1998).

Circuit held that the tying by Microsoft of its web browser software with the operating system software was permissible: any “genuine technological integration” combining functionalities in a way that offers advantages unavailable if the functionalities were bought separately and composed by the purchaser would be beneficial to consumers, regardless of whether elements of the integrated package are marketed separately.⁴³⁹ In *Microsoft III*, the District of Columbia Circuit, distinguished technological tying, a situation where the tied good is physically and technologically integrated with the tying good, from contractual tying, and applied to the former a rule of reason approach that would neither include a distinct product test (which is according to the Court “backward-looking and therefore systematically poor proxies for overall efficiency in the presence of new and innovative integration”), nor will it infer a restriction of competition from the simple existence of market power, but would require evidence by the plaintiff of anticompetitive effects in the tied product market.⁴⁴⁰

Technological tying is also recognized as a separate form of tying in EU competition law. Since the seminal judgment of the General Court in *EU Microsoft I*, in order to succeed a technological tying case in EU competition law under Article 102 TFEU, the plaintiff needs to prove that (i) the tying and the tied products are two separate products, (ii) the undertaking concerned is dominant in the market for the tying product, (iii) the practice (an agreement or technological integration) does not give customers a choice to obtain the tying product without the tied product (coercion), and (iv) the practice in question forecloses competition.⁴⁴¹ The Court expressed its reticence to accept technological tying, when this leads to the acquisition of an entrenched dominant position on the market, noting that “although, generally, standardization may effectively present certain advantages, it cannot be allowed to be imposed unilaterally by an undertaking in a dominant position by means of tying”.⁴⁴² The emergence of a *de facto* standard should be the result of competition between the “intrinsic merits” of the products and *in fine* depends on the consumers’ choice rather than on the arbitrary decision of a dominant firm to impose its own standard. The Commission’s Guidance seems inspired by these principles and applies to technological tying the same conditions as for contractual tying to be found illegal under Article 102 TFEU, noting however that “the risk of anti-competitive foreclosure is expected to be greater where the dominant undertaking makes its tying or bundling strategy a lasting one, for example through technical tying which is costly to reverse” and that “technical tying also reduces the opportunities for resale of individual components”.⁴⁴³ In a subsequent case (*EU Microsoft II*), the Commission accepted the Redmond firm’s commitments to offer a choice screen remedy for the allegedly anticompetitive practice of bundling the Internet browser software with the operating system software.⁴⁴⁴ The Commission has recently launched an

⁴³⁹ *United States v Microsoft Corp.*, 147 F.3d 935 (D.C.Cir. 1998).

⁴⁴⁰ *United States v Microsoft Corp.*, 253 F.3d 34, 89 (D.C. Cir. 2001).

⁴⁴¹ Case T 201/04 *Microsoft Corp. v. Commission* [2007] ECR II-3601. The European Commission in its Guidance on its enforcement priorities in applying Article 102 TFEU to abusive exclusionary conduct to dominant undertakings, [2009] OJ C 45/7, para. 50 does not refer to the condition of coercion. Indeed, some authors have previously argued that it is redundant: Nicholas Economides and Ioannis Lianos, ‘The Elusive Antitrust standard on bundling in Europe and in the United States in the Aftermath of the Microsoft cases’ (2009) 76(2) Antitrust Law Journal 483.

⁴⁴² Case T 201/04 (n 428) para. 1152.

⁴⁴³ European Commission, Priorities Guidance (n 247) para 53.

⁴⁴⁴ European Commission, Case COMP/C-3/39.530 – *Microsoft* (tying) (December 16, 2009), available at http://ec.europa.eu/competition/antitrust/cases/dec_docs/39530/39530_2671_3.pdf : See also, Nicholas Economides

investigation against Microsoft for not complying with the conditions of the commitment decision.⁴⁴⁵

SUMMARY. Both EU and US antitrust law may apply to bundling and tying practices. US antitrust law has evolved towards a more lenient approach to technological tying, requiring evidence of anticompetitive effects and the consideration of the efficiency gains brought by the practices. This approach is consistent across the different provisions of US antitrust law applying to tying practices. The situation is slightly different in Europe, which views tying by dominant firms with suspicion, in particular if that leads to *de facto* standardization of the industry, and takes a more aggressive stance against technological tying.

c. Package licensing

With regard to bundled licensing, the US courts have accepted that bundling two related patents together without any restrictions or any requirements regarding use will likely not be examined under a *per se* illegality rule.⁴⁴⁶ In *US Philips Corp. v. ITC*, the Federal Circuit recognized the procompetitive benefits of package licensing, such as the reduction of transaction costs, hinting to the need for the courts to examine closely the business reasons for the package license and its likely anticompetitive effects.⁴⁴⁷

The Commission's Transfer of Technology Guidelines also apply the equivalent of a rule of reason approach to bundled licensing: the Guidelines recognize the potential precompetitive benefits of package licensing and state that a package license is likely to violate Article 101 TFEU only if the market share is above the level required by the market share thresholds. Above the market share thresholds it is necessary to balance the anti-competitive and pro-competitive effects of tying.⁴⁴⁸

4. Pricing IP rights and competition law

An area with significant differences between US antitrust law and EU competition law relates to the discretion of IP holders to impose price restrictions, either by demanding high royalties or by imposing post-sale price restraints to the distributors of their products.

a. Royalty stacking, excessive royalties and price discrimination

The persistence of the patent thicket problem with the development of complex products involving numerous inputs with corresponding third-party proprietary rights attached may lead to

and Ioannis Lianos, 'A Critical Appraisal of Remedies in the EU Antitrust Microsoft Cases' 2010 2 Columbia Business Law Review 346.

⁴⁴⁵ European Commission, IP/12/1149, Commission sends Statement of Objections to Microsoft on non-compliance with browser choice commitments (October 24, 2012), available at http://europa.eu/rapid/press-release_IP-12-1149_en.htm.

⁴⁴⁶ *US Philips Corp. v. ITC*, 424 F.3d 1179 (Fed. Cir. 2005) [(Philips' package license of patents for recordable and rewritable compact discs was not per se unlawful and could involve significant efficiencies)]. *Princo Corp v. ITC*, 563 F.3d 1301 (Fed Cir. 2009).

⁴⁴⁷ *Ibid.*, pp. 1192-1193.

⁴⁴⁸ European Commission, Guidelines on Transfer of Technology (n 106) paras 191-195.

what is frequently referred to as “royalty stacking”. Royalty stacking results from multiple royalty obligations, as various licenses related to different inputs of a product combine to impose aggregate royalty obligations of an extent of 6%–20% (or greater).⁴⁴⁹ A similar problem emerges in situations of “royalty packing”, where multiple technologies are bundled together (sometimes imposed by the licensor or by best practices within an industry) also increasing the aggregate-royalty problem. Hold up problems may emerge, more so if non-practising entities holding SEP are involved, and may increase considerably the royalties paid. It is possible that the cost burden of royalties will not be based on the actual contribution of the invention to the final product. There are various techniques to deal with royalty stacking and packing: royalty ceilings, royalty floors, variable royalties, and alternatives to royalties, such as lump-sum payments and patent pools with no fee cross-licensing among the members of the pool.

Can however royalty stacking become a competition law problem? One might distinguish between the sanction by competition law of exclusionary practices leading to situations of royalty stacking from that of royalty stacking as such, that is the exploitative practice of demanding excessive royalties. There are different perceptions in the EU and the US on the liability of dominant firms for excessive pricing without exclusionary acts.

With regard to exclusionary practices, competition authorities in Europe and the US have focused on deceptive conduct in the context of a SSO. Patent holders disclosing information on their patents and patent applications prior to the adoption of a given standard can at most demand a royalty that corresponds to the marginal value of their patented technology. However, there are instances in which a patent holder may adopt the strategy to conceal during the standard-setting process this information, let the other stakeholders agree on a standard incorporating a patented technology and reveal the information that the technology is covered by a patent after the standard has gained widespread acceptance, when the negotiating position of the other stakeholders will be weakened as they would have made standard specific investments and will be kept hostage. The patent holder will then be able to demand a royalty that will far exceed the marginal value of the patented technology (the so called “patent ambush” strategy).

In *Rambus* an FTC order found Rambus’s deceit, for concealing its patents and patents and patent applications and for making outright misrepresentations and giving misleading responses to questions about its conduct in the context of the Joint Electron Device Engineering Council (JEDEC) SSO a violation of Section 2 of the Sherman Act and Section 5 of the FTC Act, noting even that deceptive conduct might be found in the absence of an express obligation to disclose.⁴⁵⁰ The FTC relied on the fuzzy disclosure obligations imposed to JEDEC members concluding that these incorporated an underlying duty of good faith and inferred from this that JEDEC members had reason to believe that the standard setting process will be cooperative and

⁴⁴⁹ On this practice, see, Einer Elhauge, ‘Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?’ (2008) 4 *Journal of Competition law & Economics* 535; Thomas F Cotter, ‘Patent Holdup, Patent Remedies, and Antitrust Responses’ (2009) 34(4) *The Journal of Corporate Law* 1151, 1160; Joseph Farrell et al, ‘Standard Setting, Patents, and Hold-Up: A Troublesome Mix’ (2007) 74(3) *Antitrust Law Journal* 603; Mark A Lemley and Carl Shapiro, ‘Patent Holdup and Royalty Stacking’ (2007) 85 *Texas Law Review* 1991; Gregory J Sidak, ‘Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro’ (2008) 92 *Minnesota Law Review* 714.

⁴⁵⁰ *In the matter of Rambus, Inc.* (August 2, 2006), Docket No. 9302, pp. 34-35 available at <http://www.ftc.gov/os/adipro/d9302/060802commissionopinion.pdf>

free from deception. The FTC also argued that Rambus' conduct prevented JEDEC from extracting a commitment from Rambus to license in Reasonable and Non-Discriminatory terms (RAND). Rambus deceit had the effect of distorting JEDEC's choice of technologies and provided Rambus monopoly power. The DC Circuit vacated the order as the FTC failed to prove that for Rambus' deceptive conduct the SSO would have adopted a competing technology (thus there was no exclusionary element).⁴⁵¹ The Court found that had Rambus disclosed the information prior the adoption of the standard, JEDEC would have either excluded Rambus technologies, or require from Rambus a RAND commitment. As to the first issue, the FTC had found evidence in its investigation that, had Rambus disclosed the information, JEDEC would have incorporated anyway Rambus' technologies. As to the second issue relating to the RAND commitment, the Court advanced that exploitative abuses are not considered as producing an antitrust harm in US antitrust law.⁴⁵² The Court also expressed reservations as to the standalone use of Section 5 FTC Act in this context and developed limiting principles for its use.

Another case involved an action against US chipset manufacturer Qualcomm, holder of IP rights in mobile telephone standards. Qualcomm made a promise before the adoption of the standard to license essential proprietary technology on RAND terms. The Third Circuit in *Broadcom Corp. v. Qualcomm*, found that intentionally deceiving the SSO with respect to a royalty commitment could constitute a monopolization cause of action under the following conditions: (1) in a consensus-oriented private standard setting environment, (2) a patent holder's intentionally false promise to license essential proprietary technology on RAND terms, (3) coupled with an [Standard Determining Organization's] reliance on that promise when including the technology in a standard, and (4) the patent holder's subsequent breach of that promise, is actionable anticompetitive conduct.⁴⁵³ Broadcom relies heavily on the FTC's analysis in *Rambus*, emphasizing that deception becomes an antitrust concern only where rival technologies are excluded from the market and consequently consumer welfare is harmed.

One could finally add the recent standalone enforcement of Section 5 of the FTC Act in *Negotiated Data Solutions (N-Data)*, *Robert Bosch GmbH* and *Google*. In these cases the FTC attempted to articulate circumstances in which conduct related to SEP royalties could fall within the scope of Section 5 FTC Act, either as an unfair method of competition or as an unfair act or practice. Hence, in *N-Data*, the FTC found that Section 5 could reach conduct that would not violate the antitrust laws, as long as the conduct has some element of coercion or oppressiveness, it causes substantial harm to consumers, which is not easily avoidable by consumers themselves and which is not outweighed by countervailing benefits to consumers or competition. In *Bosch*, the FTC made explicit that "(p)atent holders that seek injunctive relief against willing licensees of their FRAND-encumbered SEP's should understand that in appropriate cases the Commission can and will challenge this conduct as an unfair method of competition under Section 5 of the FTC Act".⁴⁵⁴ In *Google*, the FTC found that Google's threat of injunctions against possible infringers of its SEP "would likely increase costs to consumers because manufacturers using

⁴⁵¹ *Rambus Inc. v. FTC*, 522 F.3d 456 (DC Cir. 2008), cert. denied, 129 S. Ct. 1318 (2009).

⁴⁵² *Ibid.*, pp. 464-467.

⁴⁵³ *Broadcom Corp. v. Qualcomm*, 501 F.3d 311 (3d Cir. 2007).

⁴⁵⁴ *In re Robert Bosch GmbH*, File No. 121-0081 (November 26, 2012), p. 2.

Google’s SEP’s would be forced, by the threat of an injunction, to pay higher royalty rates, which would be passed on to consumers”.⁴⁵⁵

Despite this recent extension of the scope of Section 3 FTC Act, US antitrust law does not apply to purely exploitative practices. Although this had always been the case,⁴⁵⁶ it has been made clearer recently in *Verizon v Trinko*, the Supreme Court noting that “(t)he mere possession of monopoly power, and the concomitant charging of monopoly prices, is not only not unlawful; it is an important element of the free-market system. The opportunity to charge monopoly prices – at least for a short period – is what attracts “business acumen” in the first place; it induces risk taking that produces innovation and economic growth”.⁴⁵⁷ “Fair” royalties is not an objective that may be pursued through US antitrust law.

In Europe, however, excessive prices (royalties) may be found to infringe Article 102(a) TFEU which may apply to purely exploitative conduct (exploiting consumers directly without any requirement to prove any exclusionary conduct), in particular conduct that is “directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions”. In *United Brands*, the Court of Justice held that a price may be found excessive if it has no reasonable relation to the economic value of the product supplied.⁴⁵⁸ According to the Court, this excess could, *inter alia*, be determined objectively if it were possible for it to be calculated by making a comparison between the selling price of the product in question and its cost of production, which would disclose the amount of the profit margin.⁴⁵⁹ A two-steps analysis is effectuated: it has to be determined “whether the difference between the costs actually incurred and the price actually charged is excessive, and, if the answer to this question is in the affirmative, whether a price has been imposed which is either unfair in itself or when compared to competing products”.⁴⁶⁰ These two conditions (steps) are cumulative. Evidence of an excessive profit margin is not sufficient in itself to prove an abuse. The EU competition authorities employ a cost/price approach in order to determine the excessive character of a profit margin.

A possible option is to determine an adequate cost measure to measure profit (adopt a cost-plus approach), compare that to the price and then to assess the excessiveness of the profit margin, the last operation involving the definition of some benchmarks. However, the definition of the relevant costs becomes a daunting task in the context of IP rights related conduct, as developing new technology involves R&D expenses, thus high fixed costs, which it would be difficult to assess, as firms engage in multiple projects and intense cross-subsidization between

⁴⁵⁵ Some commissioners issued dissenting or concurring opinions opposing the extension of Section 5 FTC Act to catch conduct that is only remotely exclusionary and mostly exploitative. For example, in *Google*, Commissioners Ramirez and Ohlausen believed that this conduct should not fall within the authority of the FTC and that courts are better suited than the FTC to decide complex licensing disputes. Commissioner Rosch would have preferred to constrain the discretion of the FTC with more explicit limiting principles, such as that the conduct occurs in situations of monopoly or near-monopoly power, it causes particularly pernicious anticompetitive harm and is the result of deceptive conduct.

⁴⁵⁶ See, for instance, *Berkey Photo, Inc v. Eastman Kodak Co.*, 603 F2d 263, 294 (2nd Cir. 1979), cert. denied, 444 US 1093 (1980).

⁴⁵⁷ *Trinko* case (n 119).

⁴⁵⁸ Case 27/76 *United Brands v. Commission* [1978] ECR 207.

⁴⁵⁹ *Ibid* para. 251.

⁴⁶⁰ *Ibid* para. 252.

successful and unsuccessful projects. Common costs used for the development and production of different technologies (particularly in situations of cumulative innovation), makes the operation even harder. In *Scandlines*, the Commission rejected a cost-plus approach (add to marginal cost a reasonable profit calculated as a percentage of a production cost) for an approach that would look to whether the price had a reasonable relation to the economic value of the service supplied and would integrate additional costs (e.g. sunk costs, opportunity costs) and factors not reflected in the audited profits and costs (e.g. intangible value of the assets).⁴⁶¹ How much profit margin will be deemed excessive is another important issue. In *United Brands*, the Court held that a profit margin of 7% is not sufficient.⁴⁶² Some profit margin would also be entirely justified in dynamic industries or industries with network effects.

As to the adequate benchmark prices that would define the “unfair” character of the prices charged, a comparison with the prices charged by competitors might be a possible option (although one should be cautious, as price differences may indicate quality differences). In *United Brands* the Court noted that “other ways may be devised— and economic theorists have not failed to think up several— of selecting the rules for determining whether the price of a product is unfair”.⁴⁶³ Other options include the comparison with the price of the product over different geographic markets.⁴⁶⁴ In *Kanal 5*, the remuneration model applied by the Swedish Copyright Management Organisation (STIM), relating to the broadcast of musical works protected by copyright, which calculated the amount of royalties on the basis of the revenue of companies broadcasting those works and the amount of music broadcast, was found to be an abuse for the simple reason that another method would enabled the use of those musical works and the audience to be identified and quantified more precisely.⁴⁶⁵ As it is also observed in the Commission’s Guidance on the Transfer of Technology agreements, on the question of whether fees charged for access to IPR in the standard-setting context are unfair or unreasonable in the presence of a FRAND commitment, “cost-based methods are not well adapted to this context because of the difficulty in assessing the costs attributable to the development of a particular patent or groups of patents”; It may be better, instead, “to compare the licensing fees charged by the company in question for the relevant patents in a competitive environment before the industry has been locked into the standard (*ex ante*) with those charged after the industry has been locked in (*ex post*)”.⁴⁶⁶ However, the determination of the excessive nature of pricing in an IP context is notoriously difficult.

⁴⁶¹ European Commission Decision, *Scandlines Sverige AB v Port of Helsingborg*, COMP/A 36.568/D3, (July 23, 2004) available at (paras 209, 224, 226-227, 234-235). See also in an IP context, *Attheraces Limited v. The British Horseracing Board Limited* [2007] EWCA Civ 38, the Court of appeal holding that the High Court had been wrong to regard the “economic value” of the pre-race data as limited to the product of the cost + formula.

⁴⁶² Case 27/76, *United Brands* (n 458), para. 266.

⁴⁶³ *Ibid* para. 253.

⁴⁶⁴ Case 27/76, *United Brands* (n 458) para. 239; Case 395/87, *Ministère Public v. Tournier* [1989] ECR 2521; Case 110/88, *Lucazeau v. SACEM*, [1989] ECR 2811, the last two cases on the level of royalties charged by the French collecting society SACEM for playing recorded music in discotheques (acknowledging that important price differentials between Member States could indicate an abuse, unless the undertaking justifies the difference by reference to objective dissimilarities between the situation in the Member State concerned and the situation prevailing in all the other Member States).

⁴⁶⁵ Case C-52/07, *Kanal 5 Ltd v Föreningen Svedska Tonsättares Internationella Musikbyrå (STIM) UPA* [2009] ECR I-9275.

⁴⁶⁶ EU Horizontal Cooperation Agreements Guidelines (n 409) para. 289.

There has been some recent enforcement of that provision to excessive pricing in the context of a royalty stacking claim. In *Rambus*, the Commission found that Rambus had engaged in a “patent ambush” based on the same behavior examined by the FTC in this case, but reaching a different conclusion than the US competition authority.⁴⁶⁷ The Commission turned the patent ambush claim into one that Rambus had charged excessive royalties for its patents and applied Article 102(a). An Article 9 commitment decision capped the licensing fees Rambus could charge for its SEPs.⁴⁶⁸

Unfairly low prices may also be a concern for the application of Article 102(a). This does not concern predatory prices, but situations in which a dominant buyer purchases inputs at unfairly low prices. These are determined according to a comparison between the price paid and the economic value of the service provided. In *CICCE*, the Court examined an action for annulment against a decision of the Commission relating to conduct by some French television stations holding exclusive broadcasting rights to pay low license fees for the rights of films and accepted that article 102(a) could apply in these circumstances, although in this case the Commission had not found an abuse, as it was impossible, in view of the variety of the films and the different criteria for assessing their value, to determine an administrable yardstick valid for all firms, since each film is different.⁴⁶⁹

Price discrimination forms also a standalone Article 102 TFEU violation. The European competition authorities have applied articles 102 (b) and 102(c) to different practices, but article 102(c) particularly focuses on secondary line injury, that is situations in which a non-vertically integrated dominant undertaking price discriminates between customers with the effect of placing several of them or one of them at a competitive disadvantage with regard to the others. Hence, it constitutes a purely exploitative practice and another illustration of the divergence between the EU and the US models on the way unilateral practices of dominant firms are dealt in competition law. In contrast, first line injury involves a dominant firm applying different prices to its competitors and thus constitutes an example of exclusionary practice. Article 102(c) has nevertheless applied to all types of discriminatory prices, this area of EU competition law being particularly fuzzy.

There has been a lot of discussion recently on targeting purely exploitative behaviour, such as excessive royalties, through the means of Article 102(a) and the issue of royalty stacking occurring in the context of standard-setting and eventual hold up situations.⁴⁷⁰ One should bear

⁴⁶⁷ European Commission Decision, *Rambus*, COMP/38.636 (December 9, 2009), available at http://ec.europa.eu/competition/antitrust/cases/dec_docs/38636/38636_1203_1.pdf

⁴⁶⁸ See also the statement of objections sent to *Qualcomm* by the European Commission for the fact that its licensing terms and conditions for its patents essential to the standard did not comply with its own FRAND commitment and had led to excessive royalties. The Commission abandoned the case.

⁴⁶⁹ Case 298/83, *Comité des industries cinématographiques des Communautés européennes v. Commission* [1985] ECR 1105.

⁴⁷⁰ See, Massimo Motta and Alexandre de Streel, ‘Exploitative and Exclusionary Excessive Prices in EU Law’ in Claus-Dieter Ehlermann and Isabela Atanasiu (eds), *What is an Abuse of a Dominant Position?* (Hart Publishing 2006) 91; Emil Paulis, ‘Article 82 EC and Exploitative Conduct’ in Claus-Dieter Ehlermann and Mel Marquis (eds), *European Competition Law Annual 2007: A Reformed Approach to Article 82 EC* (Hart Publishing 2008) 515; Lars Hendrik Röller, ‘Exploitative Abuses’ in Claus-Dieter Ehlermann and Mel Marquis (eds) *European Competition Law Annual 2007: A Reformed Approach to Article 82 EC* (Hart Publishing 2008) 525; David S Evans and Jorge A Padilla, ‘Excessive Prices: Using Economics to Define Administrable Legal Rules’ (2005) 1 *Journal of Competition*

in mind that the Enforcement Priority Guidance of the Commission on Article 102 does not cover exploitative abuses. Commentators have expressed a number of reservations on this issue:

(i) Assessing excessive pricing may be hard. What should be the right benchmark: a competitive price? But what does this mean? Duopoly? Perfect or imperfect competition? How can it be calculated? If one allows some margin above competitive price, what is the magnitude of this margin? How to establish reasonable return on investment?

(ii) Setting clear rules for compliance in dynamic markets is even harder; How should these rules apply in dynamic markets, where there is upfront investment for the future? Should one require high *ex post* margins to incentivise *ex ante* risky investments (e.g. in R&D)? It is important to acknowledge that high margins on some activities may be required to cover fixed costs that are common across activities;

(iii) Remedies for excessive pricing can equate to price regulation (either implicitly or explicitly);

(iv) Price regulation can be distortive to competition, investment and R&D; Price regulation can inhibit entry/expansion by competitors, can distort investment incentives, can distort incentives for marketing and R&D – i.e. “portfolio pricing” approach (in view of the fact that the majority of R&D projects fail), may distort pricing incentives; Proponents of this view suggest that there may need to be explicit regulation for certain areas of natural monopoly – such as utilities – but this should be done carefully by sector-specific regulators. The rest of the economy should be left alone – since the risks of careless and ill-informed intervention outweigh any potential benefits;

(v) The problem will typically solve itself, since high profits encourage entry.

(vi) Defining what constitutes an excessive price is too complicated for competition authorities or the courts, which are not the adequate institutions for this task.

Commentators have also suggested a number of limiting principles to the application of article 102(a) to purely exploitative practices. This should apply only in narrow circumstances. There is wide agreement as to possibility to apply Article 102(a) when (i) There are very high and long lasting barriers to entry (and expansion); and (ii) the firms (near) monopoly position has not been the result of past innovation or investment. Yet some authors propose additional conditions. For example, Evans and Padilla suggest that as well as meeting the first two conditions it is necessary that (iii) the prices charged by the firm widely exceed its average total costs; and (iv) there is a risk that those prices may prevent the emergence of new goods and services in adjacent markets⁴⁷¹. Geradin, Layne-Farrar and Petit would add that there needs to be some form of an exclusionary element or deceptive practice.⁴⁷² Röller would have applied it only to situations of “enforcement gap”.⁴⁷³ Motta and De Streel argue that “there should be no sector-specific regulator”.⁴⁷⁴ Paulis disagrees with the sector regulator point, noting that the Commission should maintain the option to intervene when a national regulator is not acting or is

Law & Economics 97; Mark Furse, ‘Excessive Prices, Unfair Prices and Economic Value: The Law of Excessive Pricing under Article 82 and the Chapter II Prohibition’ (2008) *European Competition Journal* 59; Ariel Ezrachi and David Gilo, ‘Are Excessive Prices Really Self-Correcting?’ (2009) 5(2) *Journal of Competition Law & Economics* 249.

⁴⁷¹ Evans and Padilla, (n 470).

⁴⁷² Damien Geradin, Anne Layne-Farrar and Nicolas Petit, *EU Competition Law and Economics* (Oxford University Press 2012) 289.

⁴⁷³ Röller, (n 470).

⁴⁷⁴ Motta and de Streel (n 470).

taking decisions that are not in conformity with Community law.⁴⁷⁵ One could however challenge the requirement that the exploitative practice results from some form of deceptive practice or exclusionary conduct to be *contra legem*, as the text of Article 102(a) envisages unfair prices as a separate violation than the abuse of “other unfair trading conditions”. If we apply Article 102(a) to only practices that involve some exclusionary or deceptive conduct element that would jeopardize the full effect of Article 102(a) and the type of practices it aims. The strength of the case for intervention will of course vary and will be stronger if all these conditions are present. Others have criticized the assumption often made that markets are self-correcting and that high prices encourage entry.⁴⁷⁶

One could also oppose the argument over the incapacity of courts and competition authorities to define what constitutes an excessive price by referring to the role of the courts in evaluating damages in the context of competition disputes or IP infringement cases. The Commission has published detailed non-binding guidance on the different methodologies available for evaluating competition law damages.⁴⁷⁷ Similar guidance may be published for exploitative practices. US courts proceed quite often to the examination of complex econometric evidence in antitrust disputes. Finally, US courts have developed the so called *Georgia-Pacific* list of factors that are supposedly relevant to determining the amount of a reasonable royalty.⁴⁷⁸ Competition authorities and courts are also involved in the policing of compulsory licensing remedies and assess the reasonableness of royalties required. Following the decision of the European Commission finding that Microsoft’s refusal to provide interoperability infringed Article 102 TFEU, Microsoft was required to grant access to and authorize the use of the interoperability information on reasonable and non-discriminatory terms. The European Commission suggested that the assessment of the reasonableness of Microsoft’s prices depended on “whether there is innovation in the protocols, and if there is, what is charged for comparable technologies in the market”.⁴⁷⁹ According to the Commission, “such a remuneration should not reflect the strategic value, stemming from Microsoft’s market power”. In this case, the benchmark for the calculation of royalties was the incremental value of Microsoft’s protocols over the prior art and the royalties agreed among third parties for comparable technologies. Following the remedy imposed by the Commission, Microsoft submitted its remuneration schemes, containing principles for pricing the interoperability information, as these were negotiated by the parties. The Commission found that some of the remunerations charged by Microsoft for non-patented information were unreasonable and imposed periodic penalties.⁴⁸⁰

⁴⁷⁵ Paulis (n 470).

⁴⁷⁶ Ezrachi and Gilo (n 470).

⁴⁷⁷ Draft Guidance Paper, Quantifying harm in actions for damages based on breaches of Article 101 or 102 of the TFEU (June 2011), available at http://ec.europa.eu/competition/consultations/2011_actions_damages/draft_guidance_paper_en.pdf last accessed 28 April 2013

⁴⁷⁸ *Georgia-Pacific Co. v United States Plywood Co.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *mod’d*, 446 F.2d 295 (2d Cir. 1971). It is noteworthy that the Georgia Pacific factors, as developed and applied by the courts for determining reasonable royalties in patent damage cases, have been recently applied by U.S. courts also in the FRAND context (see *ESS Tech., Inc. v. PC-Tel, Inc.*, No. C-99-20292 RMW, 2001 WL 1891713, at 3-6 (N.D. Cal. Nov. 28, 2001), Rambus, Broadcom etc).

⁴⁷⁹ Commission Microsoft Decision (n 228), paras 1005-1009.

⁴⁸⁰ Commission Decision, *Microsoft* (COMP/C-3/37.792) [2009] OJ C 166/20.

The General Court confirmed the control effectuated by the Commission of the reasonableness of the royalties' rate charged.⁴⁸¹

SUMMARY. The application of competition law to pricing practices involving IP rights, even in the absence of any exclusionary conduct, constitutes a burning issue in EU competition law. US antitrust law has recently expanded the scope of Section 5 of the FTC Act to cover the exploitative effects of deceptive practices, while developing some limiting principles. The application of competition law to this type of practices might bring more problems than those it may solve, depending of course on the circumstances of the case and the capabilities of the specific competition authority or courts. Applying competition law to exploitative practices may however be justified when there are very high and long lasting barriers to entry (and expansion) and the (near) monopoly position has not been the result of past innovation or investment.

b. Post-sale restraints on IP distribution

(i) Resale price maintenance of IP protected goods

While naked horizontal price fixing agreements or more generally agreements to restrict output or supply are subject to the *per se* prohibition rule, since the seminal judgment of the Supreme Court in *Leegin*, vertical price fixing is subject to the rule of reason.⁴⁸² The case law of the Supreme Court supersedes of course section 5.2. of the Guidelines on Licensing arrangements,⁴⁸³ which still quote the position of the Supreme Court under the older precedent of *Dr. Miles*.⁴⁸⁴

While EU competition law does not provide for the possibility of *per se* prohibitions, as article 101(3) may provide an exception for any restriction of competition, if the four conditions of this article are fulfilled, resale price maintenance constitutes a hardcore restriction that falls within the scope of the prohibition principle of article 101(1). It is also explicitly excluded from the benefit of the block exemption regulation on the transfer of technology agreements⁴⁸⁵ and it is highly unlikely that it might benefit from an individual exception under Article 101(3), because often such restrictions are not the only way to achieve efficiency gains, other less restrictive to competition alternatives offering an additional option to attain them.⁴⁸⁶

(ii) Vertical territorial limitations

⁴⁸¹ Case T-167/08, *Microsoft Corp. v. European Commission* [June 27, 2012], (noting that the distinction between the strategic value and the intrinsic value of the technologies covered is a basic premise of the assessment of the reasonableness of any remuneration charged).

⁴⁸² *Leegin Creative Leather Prods., Inc. v. PSKS, Inc.*, 551 U.S. 877 (2007).

⁴⁸³ US DOJ and FTC Guidelines on Licensing Arrangements (n 220) § 5.2.

⁴⁸⁴ *Dr. Miles Med. v. John D. Park & Sons*, 220 U.S. 373 (1911). See, however, the position of the Supreme Court in *United States v. General Electric*, 272 U.S. 476 (1926), where the Supreme Court held that a restraint on the licensee's sale price was not unlawful as long as the restriction applied only to the first sale of the patented article.

⁴⁸⁵ Under article 4.2(a) of Regulation 772/2004 (n 226). See also, article 4 of Regulation 330/2010 (for vertical agreements) if the main purpose of the agreement is distribution. Maximum sale prices or recommended sale prices do not, however, constitute hardcore restrictions, provided that they do not amount to a fixed or minimum sale price as a result of pressure from, or incentives offered by, any of the parties.

⁴⁸⁶ EU Guidelines on the Transfer of Technology Agreements (n 108) para. 97.

Territorial restrictions limiting the geographic area in which one or more parties may conduct activity or sell products are also treated differently in US antitrust law and EU competition law. Although horizontal territorial restrictions are typically subject to a *per se* illegality rule, vertical territorial restrictions are assessed under the rule of reason and are considered as serving precompetitive ends.⁴⁸⁷ In Europe, territorial restrictions that lead to absolute territorial protection constitute hardcore restrictions, excluded from the benefit of the block exemption regulations.⁴⁸⁸

(iii) Vertical customer restrictions and field of use restrictions

Customer restrictions included in an agreement between non-competitors are examined in US antitrust law under the rule of reason.⁴⁸⁹ In contrast, in Europe, customer restrictions are considered as hardcore restrictions, excluded from the benefit of the block exemption regulation, some exceptions notwithstanding (e.g. field of use restrictions).⁴⁹⁰ Field of use restrictions (restrictions under which the licence is either limited to one or more technical fields of application or one or more product markets) are also considered as pro-competitive and subject to the rule of reason.⁴⁹¹ In EU Competition law, these restrictions may benefit from the block exemption, but up to the market share threshold.⁴⁹² The divergence between US antitrust law and EU competition law may be explained by the focus of the latter on market integration and the generally more negative stance it takes against exclusivity clauses.

5. IP settlements and competition law

A recent area of competition law enforcement to IP rights related conduct involves settlements of IP infringement disputes. These practices have been particularly preeminent in the **pharmaceutical** industry, where pioneer drug companies use a tool-box of patent-related practices that contribute to delays in generic entry. Most practices generate from the intersection of competition law with two regulatory regimes: patent law and market authorization regulation. The regulation for market authorizations delays competition by generics for years beyond the patent period for brand name drugs. A pioneer pharmaceutical company (originator) must invent the drug (active ingredient, formulation, delivery system), develop it, conduct safety and efficacy studies, then satisfy the Food and Drug Administration (FDA) in the US that the drug is both safe and effective. In Europe, the originator has the choice of either a national authorization procedure, a decentralized procedure, a mutual recognition procedure, or a centralized procedure.

⁴⁸⁷ US DOJ and FTC Guidelines on Licensing Arrangements (n 226) § 2.3.

⁴⁸⁸ Article 4(2)b of Regulation 772/2004, *op. cit.* if the agreement is a technology transfer agreement (practices that have as their direct or indirect object the restriction of passive sales by licensees of products incorporating the licensed technology), or Article 4 of Regulation 330/2010 if it is a distribution agreement.

⁴⁸⁹ US DOJ and FTC Guidelines on Licensing Arrangements (n 226) § 2.3.

⁴⁹⁰ Article 4(2)b Regulation 772/2004, *op. cit.*

⁴⁹¹ US DOJ and FTC Guidelines on Licensing Arrangements (n 226) § 2.3.

⁴⁹² Articles 4(2)b(i), (ii), (iii), (iv), Regulation 772/2004, *op. cit.* EU Guidelines on the Transfer of Technology Agreements (n 108) paras 100-105. Although the technical field of use restriction may correspond to certain groups of customers within a product market, the Commission explains the difference between customer restrictions (which are hardcore restrictions) and field of use restrictions (that are exempted) by the fact that the latter must be defined objectively by reference to identified and meaningful technical characteristics of the licensed product. A field of use restriction certainly limits the exploitation of the licensed technology by the licensee to one or more particular fields of use without however limiting the licensor's ability to exploit the licensed technology.

Each country within the EU has its own procedures for authorizing a marketing application for a new drug but the originator can also seek approval from several EU countries simultaneously using the decentralized or mutual recognition procedure for products that fall outside the scope of the European Medicines Agency. Under the mutual recognition procedure, destination countries recognize a product that has been first authorized by one country in the EU in accordance with the national procedures of that country. European drug approvals are overseen by the European Medicines Agency, which is responsible for the scientific evaluation of applications for authorization to market medicinal products in Europe (via the centralized procedure). This procedure takes at least 210 days (although it is possible to conduct an accelerated assessment in 150 days).

Because of the time consuming and complex pre-marketing requirements, regulators in both Europe and the US have made efforts to extend the exclusivity period for pharmaceuticals, while promoting competition on price by generics. In Europe, a specific regulation has put in place a supplementary protection certificate (SPC) for medicinal products, extending the patent right for a maximum of five years and enabling the holders of both a patent and an SPC for a medicinal product to enjoy a maximum period of up to 15 years' effective protection in every Member State from the time the medicinal product in question first receives marketing authorisation in the EEA. In the US, the Hatch-Waxman Act⁴⁹³ extended the drug patent term for as much as five years to take into account the lengthy FDA approval process. However, it balanced this extension of the exclusivity by granting generic producers the possibility to rely on branded manufacturers' prior FDA testing and the demonstration of therapeutic equivalence to an originator company's approved drug (abbreviated application process or ANDA), hence permitting generic producers to enter the market before patent expiration if the branded manufacturer's patent was either invalid or not infringed by the generic. It also injected an incentive for generic producers to challenge drug patents and seek early entry by granting the first filer a 180-day period of exclusivity in the generics market. However, the Act also provided the originators with the right to bring infringement suit under listed patents within 45 days of notice from the generic. Furthermore, the FDA is barred from approving the ANDA for thirty months in the ordinary case. We will examine how this specific regime may generate litigation and may have incentivized originators and generics to conclude agreements that may restrict competition.

Any delay for the entry of generic drugs in the market produces negative welfare effects for consumers and the national health systems. According to the European Commission's Pharmaceutical sector inquiry in 2009, the price at which generic companies enter the market is on average, 25% lower than the price of the originator medicines prior to the loss of exclusivity.⁴⁹⁴ Furthermore, in markets where generic medicines become available, average savings to the health system are almost 20% one year after the first generic entry, and about 25% after two years (EU average). The inquiry showed that because of the strategies of originators marketing authorisations were granted on average four months later in cases in which an intervention took place and produced evidence that such practices generated significant additional revenues on a number of originator products.

⁴⁹³ 21 U.S.C. § 355.

⁴⁹⁴ European Commission, Pharmaceutical Sector Inquiry, Final Report (n 43).

Originators may abuse the different regulatory regimes in order to limit competition by generics and block their market entry. First, they have developed patent strategies to extend the breadth and duration of their patent protection, by filing numerous patent applications for the same medicine (forming the so called "patent clusters" or "patent thickets"). Patent clusters make it more difficult for generic competitors to determine if they could develop a generic version of the original medicine without infringing one of the many patents of the originator company and can lead to uncertainty thus affecting the ability of generic competitors to enter the market. Second, originator companies may fill voluntary "divisional patent" applications, most prominently before the EPO. These split an (initial) parent application and can extend the examination period of the patent office, which adds to the legal uncertainty for generic companies. Third, they may market generic versions of their own drugs, which are typically marketed before the genuine generic enters the market so as to capture a significant part of the market share and reduce the incentive of generics to enter the market, a form of "evergreening" (making minor changes to the formulation of the drug in order to prevent the launch of less expensive generics). Fourth, originators may argue data exclusivity for their products in order to oppose marketing authorisations for a generic product. Fifth, they may introduce patent litigation against generics.⁴⁹⁵ Taking into account that the average duration of court proceedings in EU Member States is 2.8 years, in some jurisdictions this going up to 6 years, and the higher percentage of opposition procedures in the pharmaceutical sector for EPO's patents, the duration of the procedures severely limits the generic companies' ability to enter timely the market. In some cases, all these practices may be combined in an exclusionary strategy.

Facing these increasing hurdles, generic companies find rational to conclude settlement agreements with the originators. Originators have also an incentive to conclude settlements as they have prevailed in less than the half of cases (75% in the US⁴⁹⁶), despite the strong presumption that requires accused infringers to prove patent invalidity by clear and convincing evidence. Settlements typically limit the ability of the generic company to enter the market (the generic agrees not to market for part or all of the patent term or not to challenge the validity of the patent) but a significant proportion of these settlements contains, in addition to this restriction, a value transfer from the originator company to the generic, most often a direct payment ("pay for delay" or "reverse settlements") or a form of license or a future supply relationship, as side-deals. Indeed, as it was noted in the Commission's Pharmaceutical sector inquiry, between 2000 and 2007, originator companies and generic companies entered into a large number of agreements concerning the sale/distribution of generic medicines, one third of which were concluded with generic companies before the originator company's product lost exclusivity ("early entry agreements"). These "early entry" agreements contain clauses that provide for a certain type of exclusive relationship between the contracting parties, their duration typically exceeding the date of loss of exclusivity on average by more than two years.⁴⁹⁷ For most of those agreements, the generic products were the first generic products on the market and, thus, were likely to benefit from certain first mover advantages.

⁴⁹⁵ See, our analysis, *op. cit.* The Commission noted in the Pharmaceutical sector inquiry that the number of patent litigation cases between originator and generic companies increased by a factor of four between 2000 and 2007.

⁴⁹⁶ Federal Trade Commission, *Generic Drug Entry Prior to Patent Expiration: An FTC Study*, (July 2002), available at <http://www.ftc.gov/os/2002/07/genericdrugstudy.pdf>, pp. 19-20.

⁴⁹⁷ European Commission, *Pharmaceutical Sector Inquiry – Final Report* (n 43), p. 10.

The incentive structure for generics and originators established by the Hatch-Waxman Act may encourage the use of litigation, reverse settlements and other early entry agreements. Indeed, while the originator risks the end of exclusivity and lost profits on sales of the drug, the first generic to get ANDA benefits from the exclusivity period of 180 days, the prices, during this period, being on average quite high and dropping even more after the end of the generic exclusivity period.⁴⁹⁸ The pay-for-delay provisions costing the branded companies far less than the profits they would lose from price competition, while generic makers gaining far more than they would from competing on the market, both sides benefit from the settlement to the detriment of the consumers who lose access to lower-priced generics.⁴⁹⁹ The amount of these side payments may be significant: in *Cipro*, the originator agreed to make payments which totaled \$398 million. The Commission found in its Pharmaceutical sector inquiry that patent settlements in Europe totaled transfers to generics of about 200 million Euros from 2000 to 2007. In other words, with these settlements, originators and generics divide monopoly profits.

Different approaches have been proposed in order to reconcile intellectual property and competition law in this context.⁵⁰⁰ One approach would be to examine the scope of the IP right and determine if the exercise of market power was inside the scope of the patent or outside. If the alleged infringer would have been able to stay on the market and compete but for the settlement, then the settlement might enable the patent holder to exercise market power outside the scope of the patent right, and the reverse settlement will be found unlawful. If it would not have been possible for the alleged infringer to continue to compete, then it is unlikely that the settlement would violate competition law. Another approach would be to focus on the welfare effects of the practice and examine if the proposed settlement generates “at least as much surplus for consumers as they would have enjoyed had the settlement not been reached and the dispute instead (were) resolved through litigation”.⁵⁰¹ This approach would require decision-makers to “finely calibrate the likelihood of entry”, based on the probabilistic strength of the patent litigation.⁵⁰² Finally, another approach would not find an infringement of competition law so long as the parties were settling a legitimate IP dispute and the settlement was within the potential scope of the IP right. Challenges to patent settlements can go forward only if the infringement suit is “objectively baseless”, thus applying the first prong of the sham litigation test. Some would go even as far as requiring evidence of both prongs of the sham litigation test and/or the Walker Process test for fraudulent litigation.

The treatment of reverse settlements in US antitrust law has been a subject of great controversy, the FTC being actively engaged in this area.⁵⁰³ US appellate courts had also the occasion to examine a number of these cases, taking different perspectives.⁵⁰⁴ In *Cardizem*, the

⁴⁹⁸ For an analysis, see Federal Trade Commission, *Generic Drug Entry Prior to Patent Expiration: An FTC Study* (July 2002), available at <http://www.ftc.gov/os/2002/07/genericdrugstudy.pdf>

⁴⁹⁹ FTC Staff Study, *How Drug Company Pays-Offs Cost Consumers Billions* (January 2010), available at <http://www.ftc.gov/os/2010/01/100112payfordelayrpt.pdf>

⁵⁰⁰ For further analysis, see, ABA Section of Antitrust Law, *Intellectual Property and Antitrust Handbook* (2007), pp. 252-270.

⁵⁰¹ Carl Shapiro, ‘Antitrust Limits to Patent Settlements’ (2003) 34 *Rand Journal of Economics* 391, 395-396.

⁵⁰² ABA Section of Antitrust Law, *op. cit.*, p. 256.

⁵⁰³ See, <<http://www.ftc.gov/opa/reporter/competition/payfordelay.shtml>> accessed 29 April 2013.

⁵⁰⁴ *In re Cardizem CD Antitrust Litig.*, 332 F.3d 896 (6th Cir. 2003) (*Cardizem*), *cert. denied*, *Andrx Pharm., Inc. v Kroger Co.*, 543 U.S. 939 (2003); *Ark. Carpenters Health & Welfare Fund v Bayer AG*, 604 F.3d 98, *reh’g en banc*

6th Circuit held that reverse money payment was a significant factor (“bolster[ing] the patent’s effectiveness”) in finding settlement agreement pending appeal *per se* illegal.⁵⁰⁵ The case was distinguished by the Second, Eleventh, and Federal Circuits, which considered that there was no violation for the Sherman Act so long as settlements are limited to the scope of the patent, absent fraud or sham litigation. Different reasons were advanced for this more lenient policy: the redistribution of risks by the Hatch-Waxman Act in favor of generics (allowing generic manufacturers to challenge the validity of the patent without incurring the costs of market entry or the risks of damages from infringement), the statutory presumption of patent validity, the favorable view over final settlements of litigation, as this reduces litigation costs. While refusing to grant certiorari in six cases, the Supreme Court has recently taken *Federal Trade Commission, Petitioner v Watson Pharmaceuticals, Inc., et al*, wherein two generic drug manufacturers agreed to delay their entry into the market in exchange for a share of profits from the sale of brand-name drug AndroGel and the judgment is awaited in the following months.⁵⁰⁶

With regard to EU competition law, no-challenge clauses often included in patent settlements agreements have generally been considered as not falling within the scope of Article 101(1) TFEU, unless the agreements are not directly connected to the settlement.⁵⁰⁷ As the Commission has recently noted in its Pharmaceutical industry sector inquiry and its recent proposal for revised guidelines on the Transfer of Technology agreements, no-challenge clauses may nevertheless infringe Article 101(1) “where the licensor knows or could reasonably be expected to know that the licensed technology does not meet the respective legal criteria to receive intellectual property protection, for example where a patent was granted following the provision of incorrect, misleading or incomplete information”, thus adopting for this type of practice an intent test. With regard to reverse settlements, the Commission has sent statement of objections to Lundbeck and Les Laboratoires Servier for having entered into agreements that foresaw substantial value transfers from the originator to the generics in order to delay their entry in the market.⁵⁰⁸ The recent proposal for revised Guidelines of the European Commission on Transfer of Technology agreements, currently in public consultation, mention for the first time, reverse settlements, noting that “agreements between competitors which include a licence for the technology and market concerned by the litigation but which lead to a delayed or otherwise limited ability for the licensee to launch the product on this market may under certain

denied, 625 F.3d 779 (2d Cir. 2010); *In re Ciprofloxacin Hydrochloride Antitrust Litig.*, 544 F.3d 1323 (Fed. Cir. 2008); *In re Tamoxifen Citrate Antitrust Litig.*, 466 F.3d 187 (2d Cir. 2006) ; *Schering-Plough Corp. v. F.T.C.*, 402 F.3d 1056 (11th Cir. 2005).

⁵⁰⁵ *In re Cardizem CD Antitrust Litig.*, p. 908.

⁵⁰⁶ See, http://www.americanbar.org/publications/preview_home/12-416.html

⁵⁰⁷ EU Guidelines on Transfer of Technology Agreements (n 106) para. 209; Case 193/83 *Windsurfing International v Commission* [1986] ECR 611. In contrast, trademark delimitation agreements are dealt as classic market sharing agreements: see, Case 35/83 *BAT Cigaretten-Fabriken GmbH v Commission* [1985] ECR 363.

⁵⁰⁸ In the Citalopram case, Lundbeck and several generic competitors were accused to have entered into agreements which may have hindered the entry of generic citalopram into markets in the EU: http://europa.eu/rapid/press-release_IP-12-834_en.htm. In the Perindopril case, the Les Laboratoires Servier and several generic competitors were accused to have entered into agreements which may have hindered the entry of generic perindopril into the EU. See also, the recent (April 19, 2013) statement of objections sent by the UK Office of Fair Trading (OFT) to GlaxoSmithKline (GSK), following its investigation into patent litigation settlement agreements (PLSAs) in the pharmaceutical sector. The underlying factual complaint related to GlaxoSmithKline’s alleged conduct in defence of one of its blockbuster drugs, Seroxat, which is a prominent anti-depressant (paroxetine), in particular the PLSAs it concluded with three generics companies (pay for delay): <http://oft.gov.uk/news-and-updates/press/2013/36-13>

circumstance be caught by Article 101(1)”. They add that “(s)crutiny is necessary in particular if the licensor provides an inducement, financially or otherwise, for the licensee to accept more restrictive settlement terms than would otherwise have been accepted based on the merits of the licensor's technology”.⁵⁰⁹

SUMMARY. The explosion of IP litigation, in particular in the peculiar regulatory context of the pharmaceutical industry, has led patent holders to employ a number of strategies so as to delay the entry of generics in the market to the detriment of consumers. Some of these practices take the form of reverse settlements or pay for delay settlements and early entry agreements. Both US and EU competition law have examined these practices and in some cases have concluded that they may infringe competition. However, the competition authorities at both sides of the Atlantic have not managed yet to define clear standards that would enable them to distinguish between legitimate settlements of an IP dispute and those that would infringe competition law.

IV. EXHAUSTION (FIRST SALE)

While patents produce dynamic benefits by encouraging innovation, they also produce allocative inefficiencies⁵¹⁰. An exclusive right holder seeking to maximize returns will tend to raise prices over the competitive price and decrease output. This produces a deadweight loss, in that there are potential consumers who forego purchase at the “monopoly” price even though they could put the invention to good use (and thus raise social welfare). The patentee does not make the sale, and thus earns less than the full potential return. The exhaustion (first sale) doctrine mitigates the first problem. Once a patentee sells an embodiment of the invention (or authorizes such a sale), his interest in that embodiment is deemed to be exhausted. The buyer can resell, creating a secondary market where goods are available at lower cost. Those who would not pay the original price can purchase in the secondary market and enjoy the benefit of the invention. The first sale doctrine is also said to fulfill purchasers’ expectations in that it limits restraints on alienation.

There are, however, numerous problems with the first sale doctrine. First, exhaustion does not fully mitigate the first problem. Instead, it can increase the patentee’s loss in that the secondary market can compete with the primary market for the patentee’s products. This exerts a downward pressure on price and reduces incentives to innovate. Patentees thus prefer to deal with deadweight loss by segmenting markets and charging differential prices, depending on what that market can pay. The first sale doctrine interferes with this strategy because buyers can purchase in the low-cost segment of the market and resell to the high-cost segment. In particular, patentees use international boundaries for this purpose. As a result, prices in some countries will be significantly lower than prices in other countries. Patentees do not believe that their interest in selling where the price is high is “exhausted” by sale where the price is low.

⁵⁰⁹ Draft Proposal for Revised Guidelines of the European Commission on Transfer of Technology Agreements, available at <http://ec.europa.eu/competition/consultations/2013_technology_transfer/guidelines_en.pdf> para. 223, last accessed 28 April 2013.

⁵¹⁰ On the complex economics of parallel trade, see Keith E Maskus, *Private Rights and Public Problems – The Global Economics of Intellectual property in the 21st Century* (Peterson Institute for International Economics, 2012), pp. 172-188.

Patentees also have other interests in the fate of the embodiments they sell. Some products are dangerous if not refurbished correctly. In these cases, the patent holder needs to control resale in order to assure quality (and protect itself from tort liability). Some products, particularly in the **agriculture and software sectors**, are self-replicating; if their reuse cannot be controlled, the primary market can be entirely destroyed. Thus, in *Bowman v. Monsanto*,⁵¹¹ the Supreme Court held that the sale of one generation of seed does not exhaust rights on later generations: a farmer who purchased seed to grow could not sow a new crop using the seeds produced by the first crop—that, the Court held, would constitute *making* the patented product and not *reusing* or *selling* the seed that had been purchased. Finally, in parts of the **IT** sector, products are brought to market through value chains, starting with manufacturers of components and moving to fabricators, distributors and retailers. Because there are differing arrangements among the members of the chain, participants need to control sales as their products move along the chain.

Because the arguments both for and against exhaustion are so strong, the TRIPS Agreement did not take a position on this issue, except to say that WTO members are bound by the national treatment and most favoured nation provisions (arts. 6, 3, & 4). Thus members are free to define the limits of exhaustion as they see fit and to allow patent holders to mitigate the cost of the doctrine contractually. They cannot, however, regard sales as exhausting foreign right holders' interests in circumstances where they would not regard national right holders' interests as exhausted.

1. Defining first sale.

In defining the scope of first sale, the first question is *what* constitutes a sale. While it is not entirely clear from TRIPS, exhaustion is generally thought to apply only to voluntary sales by the patent holder. However, it is arguably also applicable to sales made under a compulsory license (and subject to royalty payments to the patentee). Some countries also view any lawful sale—such as sales in countries where the invention is not patented—as subject to the doctrine. It remains unclear whether definitions that do not involve voluntary sales are consistent with TRIPS. Significantly, when the WTO decided to expand the use of compulsory licenses during the Doha Round, it took steps to ensure that the medicines produced under the license do not find their way into the right holder's principal markets (in other words, such sales are not considered subject to exhaustion).

Harder is the question of *where* the sale must take place. Virtually every country regards sales within its territory as within the exhaustion doctrine (subject to the exceptions discussed below). However, countries take radically different positions on sales outside their territory. The United States' position on international exhaustion (parallel importation) has been in flux for some time. In a very recent case, *Kirtsaeng v Wiley*, the Supreme Court held that sales of *copyrighted* works outside the United States are subject to exhaustion.⁵¹² Thus, a student was permitted to buy copies of textbooks in Thailand at a low price, resell them in the United States

⁵¹¹ ___ S.Ct. ___ (May 13, 2013).

⁵¹² *Kirtsaeng v. John Wiley & Sons, Inc.*, ___ S.Ct. ____ (March 19, 2013).

at a higher price, and pocket the difference. In contrast, the Federal Circuit has held that there is no international exhaustion of *patented* products and processes, but that was before the Supreme Court decided *Kirtsaeng*.⁵¹³

The EU has taken an intermediate position: sales within the EU (Community exhaustion) are subject to exhaustion, but sales outside the EU (international exhaustion) are not. In *Silhouette*, the Court of Justice found that an Austrian rule providing for exhaustion of trademark rights in respect of products put on the market outside the European Economic Area ("the EEA") under that mark by the right holder or with his consent was contrary to Community legislation relating to trade marks.⁵¹⁴ Exhaustion occurs only where the products have been put on the market in the EEA and, in presence of complete harmonisation of the rules relating to the rights conferred by a trade mark, Member States cannot provide in their domestic law for international exhaustion of the rights conferred by a trade mark in respect of goods put on the market in non-member countries.⁵¹⁵ With regard to sales inside the EU, the Court of Justice has established two conditions for the exhaustion of the distribution right of the third party purchaser to resell the IP protected work in another Member State without the risk of infringement: (i) the goods should be placed on the market and sold, so as for the holder of the IP right to realize the economic value of the right, (ii) the holder of the IP right must have consented to the goods being put on the market within the EEA.⁵¹⁶ Consent is presumed if the intellectual property rights holder and the first sale distributor are under common control or linked economically or when there is a voluntary grant of a license. However, this is not the case if the goods have been put on the market in breach of a license condition designed to protect the reputation of the right holder or when the goods are produced under a compulsory license.⁵¹⁷ With regard to imports coming from outside the EEA, in *Davidoff* the Court held that "consent must be so expressed that an intention to renounce those rights is unequivocally demonstrated" or "it may, in some cases, be inferred from facts and circumstances prior to, simultaneous with or subsequent to the placing of the goods on the market outside the EEA which, in the view of the national court, unequivocally demonstrate that the proprietor has renounced his rights".⁵¹⁸ The trader should thus demonstrate that the right holder consented to the marketing of the product, the silence of the right holder being not a sufficient element to infer the existence of consent.⁵¹⁹ Furthermore, EU law recognizes the right holder's right to protect its reputation from any modification of its work, or

⁵¹³ *Jazz Photo Corp. v U.S.*, 439 F.3d 1344 (Fed. Cir. 2006).

⁵¹⁴ Case C-355/96 *Silhouette International Schmied GmbH & Co. KG v Hartlauer Handelsgesellschaft mbH* [1988] ECR I-4799 interpreting Article 7 of Directive 2008/95 to approximate the laws of the Member States relating to trademarks [2008] OJ L299/25.

⁵¹⁵ The Court, however, noted that the EU authorities could always extend the exhaustion provided for by Article 7 to products put on the market in non-member countries by entering into international agreements in that sphere, as was done in the context of the EEA Agreement.

⁵¹⁶ See, for instance, for trademarks Article 7 Directive 2008/95 to approximate the laws of the Member States relating to trademarks OJ [2008] L 299/25.

⁵¹⁷ For analysis, see Oke Odudu, 'Intellectual Property Rights' in Bellamy and Child: *European Union Law of Competition* (Oxford University Press 2013), Ch 9, pp. 682-687.

⁵¹⁸ Joined cases C-414 & 416/99 *Zino Davidoff and Levi Straus* [2001] ECR I-8691, paras 45-46.

⁵¹⁹ See, also Case C-244/00 *Van Doren + Q* [2003] ECR I-3051 (on the question of the concrete allocation of the burden of proof for the exhaustion objection in a trade mark infringement proceeding).

from a risk of confusion of the consumers on the genuine origin of the product or passing-off, even after a first sale.⁵²⁰

As suggested by the position taken by the TRIPS Agreement, there is substantial disagreement on which view of international exhaustion is better from a public welfare perspective.⁵²¹ A strong exhaustion doctrine advances the interests of each country's own consumers because they potentially have access to cheaper goods from abroad. However, the advantage to consumers comes at the expense of the patent holder's interest in maximizing its return. Thus, it reduces incentives to innovate. In the long run, a strong exhaustion doctrine can also harm the citizens of poorer countries where the product is protected. The right holder may refuse to sell in those markets to avoid the backflow of goods. Or the right holder may set the price based on global demand. Thus, prices will rise in poor countries and fall in rich countries. For example, now that it is clear that books sold in Thailand can be imported into the United States, the publisher may well raise the Thai price. The deadweight loss in Thailand will rise as fewer Thai consumers can afford to buy the texts at the international price. In short, the impact of the exhaustion doctrine on welfare depends on whether one is interested in *consumer* welfare, *producer* welfare, *overall national* welfare, or *overall global* welfare.

2. The role of contracts (licensing to avoid first sale).

Right holders often attempt to mitigate the effects of the exhaustion doctrine contractually. For example, in *Kirtseng*, the books were marked as for sale outside the United States. Patentees also try to advance other interests through restrictive licenses. Thus, in *Mallinckrodt v Medipart*, a medical device used to deliver radioactive material was marked "single use only" with the goal of preventing refurbishment and resale.⁵²² In *Quanta Computer v LG Electronics*, a value-chain licensing case, LGE licensed Intel to manufacture and sell microprocessors and chipsets that used LGE's patents, but the deal made clear that no license "is granted by either party hereto ... to any third party for the combination by a third party of Licensed Products of either party with items, components, or the like acquired ... from sources other than a party hereto, or for the use, import, offer for sale or sale of such combination."⁵²³ Similarly, those holding utility patent rights in seed sell subject to a contractual provision that bars the farmer from saving seed and using it to grow another generation of crops.⁵²⁴ When these provisions are violated, the exhaustion doctrine may bar *infringement* actions. However, acts in violation of these licenses may be regarded as *breaches of contract*.

Courts in the United States have, however, had a difficult time deciding whether these license provisions should be enforced. If the first sale doctrine is an important limit on the patent holder's rights, or if the doctrine is considered crucial to the public interest, then the patent holder should not be permitted to override the limitations contractually. The Supreme Court has

⁵²⁰ See, for instance, Case 119/75, *Terrapin v Teranova* [1976] ECR 1039. Some case law of the Court of Justice has also examined if re-packaging of medicinal products affects the reputation of the trade mark holder: see, for instance, case C-143/00 *Boehringer Ingelheim (No. 1)* [2002] ECR I-3759.

⁵²¹ For an empirical study of parallel import restrictions in the copyright context, see Australian Government, Productivity Commission Report, *Restrictions on the Parallel Importation of Goods* (2009).

⁵²² *Mallinckrodt, Inc. v Medipart, Inc.*, 976 F.2d 700 (Fed. Cir. 1992).

⁵²³ *Quanta Computer, Inc. v LG Electronics, Inc.*, 553 U.S. 617 (2008).

⁵²⁴ *Monsanto Co. v Bowman*, _S. Ct. _ (May 13, 2013).

hinted that it subscribes to this view. Thus the legend in *Kirtsaeng* limiting sales to regions outside the United States did not figure into the Court’s decision—it allowed the books to be resold in the United States. In *Quanta*, the Supreme Court held that the license could not be used to limit the rights of fabricators to utilize purchased components as they wished.

On the other hand, the Supreme Court appeared to have granted certiorari in *Bowman v Monsanto*, the case about patented seeds, to reconsider whether restrictive licenses are enforceable. However it did not reach the issue once it decided that growing a second crop constitutes “making” rather than “using” or “selling”.⁵²⁵ It is thus possible that the Court will permit contractual overrides to the first sale doctrine when the restriction is clear to the party against whom the contract is being enforced and/or when the restriction has an important public purpose. Thus, in *Quanta*, the Court may not have understood the need for the restriction. Furthermore, the license was confusing: after limiting the right to use the components sold, it stated that “[n]otwithstanding anything to the contrary contained in this Agreement, the parties agree that nothing herein shall in any way limit or alter the effect of patent exhaustion that would otherwise apply when a party hereto sells any of its Licensed Products”. As a result, buyers may have lacked adequate notice of the restriction. Furthermore, the Court may have thought that in that particular case, the provision was anticompetitive—that the exhaustion doctrine enhanced competition among fabricators and distributors. In contrast, in the medical device case, the Federal Circuit found the “single use only” restriction was clear to purchasers and crucial for quality control purposes (that case did not go to the Supreme Court). As noted above, courts in the EU have taken an intermediate position on the significance of the right holder’s consent.

SUMMARY. The social welfare effects of the exhaustion doctrine are indeterminate. The doctrine benefits consumers and downstream manufacturers. However, these benefits may be offset by diminished incentives to innovate. In international cases, the benefits may also be offset by subsequent price adjustments by the patentee. In cases where there is a clear social benefit to limiting resale—such as to protect quality, safeguard health, or prevent self-replication—courts have proved somewhat willing to enforce contractual restrictions. But because the doctrine protects the expectation interests of purchasers, buyers must have adequate notice of restrictions prior to purchase.

V. GOVERNANCE ISSUES

A. Improving the Governance of the Intellectual Property System

For the most part, copyright and trademark governance is considered rather straightforward. Copyrights arise automatically. Registration, if it is required at all, is essentially a ministerial act. In the United States, it is carried out in the United States by the Copyright Office, an agency within the Library of Congress. Enforcement is in the courts of general jurisdiction.

In the United States, federal trademark cases are more complicated because registration is necessary to acquire full federal trademark protection and the application requires examination (state marks can be acquired through use and enjoy certain federal rights as well). Federal

⁵²⁵ See *Bowman*, footnote 3.

registration is handled by the Patent and Trademark Office (the USPTO). The Manual of Trademark Examining Procedure guides its work. The USPTO has a special appeal tribunal, the Trademark Trial and Appeals Board, to hear appeals from denials of registration. Appeals from the USPTO are usually heard in the United States Court of Appeals for the Federal Circuit. As with copyrights, enforcement actions are heard in courts of general jurisdiction.

Patent rights are more complicated still. The USPTO handles examination, using the Manual for Patent Examining Procedure (MPEP). As with trademarks, there is an adjudicatory tribunal within the agency—the Patent Trial and Appeal Board (PTAB)—and appeals from there are usually heard in the Federal Circuit. Enforcement of patents is in trial courts of general jurisdiction, but appeals are channeled to the Federal Circuit.

In all these cases, the losing party has a right to petition for review in the United States Supreme Court. However, the Supreme Court enjoys the right to decide which petitions to grant. Historically, it has granted review in very few intellectual property cases.

For trademarks and patents, the EU system is quite different. Copyrights are national rights. However, the EU has issued a series of directives on copyright term, rental rights, database rights, rights over the internet, and other matters which all EU countries must implement. All of the countries of the EU maintain their own patent and trademark offices and the national rights that emanate from these offices are dealt with in national courts. In addition, the EU recognizes a Community Trademark, which is examined in the Trade Marks and Designs Registration Office of the European Union and litigated in national courts. Finally, the countries of the EU are members of the European Patent Convention (EPC), which also includes many countries that are not in the EU. An EPC patent is examined in the European Patent Office (EPO). After a period when it can be centrally challenged in the EPO, the patent matures into patent rights in each of the EPC countries designated by the right holder. At that point, enforcement is in national courts. The EU is currently contemplating the development of a Unitary Patent, which would be examined in the EPO and enforced in a set of specialized courts. For all regimes, questions on interpreting EU law are ultimately for the Court of Justice of the European Union (the ECJ).

Governance issues arise mainly in connection with patents, which involve a complicated legal regime applied to technologically complex material. As new technological prospects emerge, the law must be adapted to meet the needs of industry and the public. Incorrect decisions are also extraordinarily costly. The failure to grant patents can inhibit innovation. But overgranting puts a tax on innovation, raises transaction costs prohibitively, attracts non-practicing entities, and induce holdups. Because the situation in the EU is complicated by the separate authorities of the EPC and the EU, governance issues will be discussed through the lens of the US system.

1. The role of the USPTO.

As noted above, initial decisions on patentability are made by a specialized agency. The USPTO is composed of a corps of examiners trained in the art they examine. The administrators of the USPTO guide their practice, in part through supervision of decisions and review in the

PTAB, in part through the MPEP, and in part by writing guidelines on areas of particular importance. For example, the USPTO is currently working on guidelines for claiming **software**, with the goal of requiring claims and disclosure that are more focused and less indeterminate. When developing these rules, the USPTO generally announces its proposal and then holds a series of hearings around the country to give interested parties an opportunity to comment. Written comments can also be sent directly to the USPTO. The “notice and comment” procedure is reiterative, until the USPTO issues its final guidelines.

In the United States, most regulatory agency rulemaking is entitled to substantial deference, on the theory that the agency is composed of experts in the field they are regulating. For historical reasons, however, the USPTO has never received rulemaking authority, except for matters related to practice before the PTO (such as attorney qualifications).⁵²⁶ While it can make rules to guide examination, most of the rules the USPTO develops are not entitled to formal deference in court. Similarly, while the Office of Information and Regulatory Affairs (OIRA) performs a cost-benefit analysis on all agency actions that are legislative in nature, most USPTO rules are not legislative and are therefore have not traditionally been subject to review. That said, as patent issues have become more salient in the economy, OIRA has begun to take notice. It has statutory authority to conduct cost-benefit analysis of “significant” rules, even if not legislative and has begun to do so with regard to certain intellectual property issues, such as government approaches to standard-setting involving patented standards. More controversially, since 1999, OIRA has also asserted the authority to review any rule with an impact of over \$100 million or that creates a serious inconsistency or otherwise interferes with an action taken or planned by another agency.⁵²⁷ Thus, it could begin to review more USPTO actions. OIRA is, however, a small agency; the extent to which it will have the capacity to scrutinize the USPTO’s actions remains unclear.

To some extent, the degree of deference given the USPTO by courts may also change. The latest patent statute, the America Invents Act (AIA),⁵²⁸ vests new adjudicatory authority in the USPTO. While the agency’s Board has always heard appeals from patent rejections, and has had limited capacity to reexamine patents when new prior art has been found, it will now entertain post grant review, allowing interested members of the public to oppose patent grants for the first nine months after issuance (this procedure will be similar to the opposition procedure in the EPC).⁵²⁹ In addition, the Board will entertain *inter partes* actions in certain types of cases.⁵³⁰ These procedures will give the USPTO a broader perspective on patents and on their impact on competition and innovation. In addition, the USPTO now has a Chief Economist who is charged with conducting research on patent issues as they arise.⁵³¹ Most important, the UPTO will acquire the authority to set its own fees. As a result, it will no longer be in a position where it is

⁵²⁶ The scope of this authority remains somewhat ill-defined, see, e.g., *Tafas v. Doll*, 559 F. 3d 1345 (Fed. Cir. 2009).

⁵²⁷ See, e.g., Office of Management and Budget, Office of Information and Regulatory Affairs Q & As, http://www.whitehouse.gov/omb/OIRA_QsandAs (discussing Executive Order 12866 and amendments); OMB Circular A-119, http://www.whitehouse.gov/omb/circulars_a119 last accessed 28 April 2013.

⁵²⁸ Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. (US) 284 (2011).

⁵²⁹ 35 U.S.C. §§ 321-329.

⁵³⁰ 35 U.S.C. §§ 311-319.

⁵³¹ For the research agenda and reports of the Chief Economist, see <<http://www.uspto.gov/ip/officechiefecon/>> last accessed 28 April 2013.

forced to issue patents to support its operations.⁵³² Finally, the USPTO is establishing satellite offices near technology centers (for example, Detroit, home of the **automobile industry**; Silicon Valley, home of **the IT industry**; and Dallas, home of the **petroleum industry**). Examiners in these locations are likely to become highly expert in the technologies of the local industries and especially aware of these industries' needs.

As a result of these new capacities, institutions, and procedures, there is an expectation that the rules developed by the USPTO will be accorded more respect, if not official deference. Furthermore, because the new *inter partes* procedure is cheaper and faster than adjudication, the USPTO may become the preferred venue for litigation (indeed, trial judges may suspend adjudication of cases pending USPTO determination of the validity of relevant patents). Because the USPTO's decisions are entitled to *res judicata* effect, the USPTO's views may, as a practical matter, become the final disposition in many future cases.

2. The Role of the Courts.

Until 1982, courts of general jurisdiction ultimately developed patent law through litigation: a special court, the Court of Claims and Patent Appeals (CCPA) heard appeals from the USPTO; regional trial courts heard enforcement actions at the first instance; and the US regional circuits heard appeals from the trial courts. This led to three problems. First, because the courts of appeals are not bound by each other's decisions, notorious differences developed between the law applied in examination—which was developed by the CCPA—and the law applied by regional trial and appeals courts in litigation. Second, the regional courts of appeals had each adopted different views on patents, leading to intense levels of forum shopping among them. Third, generalist judges did not always interpret the law in a manner consistent with optimal levels of innovation. Supreme Court intervention was regarded as too infrequent to solve these problems.

In 1982, the Federal Circuit was created to hear a range of cases, including all appeals from the USPTO and all federal trial court cases in which the plaintiff's claims arise under the patent act.⁵³³ As a result of channeling almost all federal patent cases to a single court, it was assumed that the notorious differences would disappear, as would forum shopping. In addition, the Federal Circuit was expected to build considerable expertise in patent law—that is, to provide the expert perspective that the USPTO could not, as a historical matter, furnish.

⁵³² For evidence that the previous fee structured distorted granting behavior, see Michael D Frakes and Melissa F Wasserman, 'Does Agency Funding Affect Decision making? An Empirical Assessment of the PTO's Granting Patterns (2013) 66 *Vanderbilt Law Review* 67; Robert P Merges, 'As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform' (1999) 14 *Berkeley Technology Law Journal* 577, 589-91.

⁵³³ See 28 U.S.C. § 1295 (providing for jurisdiction over appeals of regional adjudication of all patent disputes and certain tort cases brought against the United States; of decisions of the Court of Federal Claims and the Court of International Trade; of certain decisions of the International Trade Commission; of decisions of the Merit Systems Protection Board; of certain tax decisions from the courts of the Canal Zone, Guam, the Virgin Islands, and Northern Mariana Islands; of dispute resolution under the Contract Disputes Act and various economic measures, including the Harmonization Tariff Schedule, the Economic Stabilization Act, the Emergency Petroleum Allocation Act, the National Gas Policy Act, and the Energy Policy Conservation Act; and of certain agency action under the Federal Labor Relations Authority, the Patent Act, and the Lanham (Trademark) Act). See generally, Rochelle C Dreyfuss, 'The Federal Circuit: A Case Study in Specialized Courts' (1989) 64 *New York University Law Review* 1 (1989).

Views on the Federal Circuit's performance are somewhat mixed. The patent bar is very pleased with the court. Practitioners believe the law is more predictable and uniform across the nation. Adjudication is also more efficient and open issues are resolved relatively speedily. Empirically, patent filings have increased as the Federal Circuit has made patents more secure. Indeed, the Federal Circuit's popularity among practicing patent lawyers has led many other nations to create specialized patent (or specialized intellectual property) courts as well.

At the same time, there is reason for concern. First, much of the complexity in patent cases arises in the factual part of the case (figuring out the facts or applying the law to the facts). But fact-finding is the province of the trial court; courts of appeals review fact finding very deferentially; it is only legal conclusions that are reviewed *de novo*. In order to better supervise the lower courts, the Federal Circuit has deemed many factual questions to be questions of law and it has tended to impose rigid, bright line rules to make it easier for the generalist judges to apply the law to the facts. But both moves have been severely criticized. For example, claim construction is considered a legal issue. As a result, a trial court will construe the claim, hear the rest of the case, and reach final decision—only to find that the Federal Circuit has reversed the claim construction. At that point, the entire case may have to be retried. Further, many of the Federal Circuit's bright line rules have been reversed by the Supreme Court as overly rigid.⁵³⁴

Better might be to create expert *trial* courts. Channeling all cases to a single set of trial courts would produce judges with greater facility to read technical materials. With better acquaintance with the somewhat arcane rules of patent law, these judges would become more likely to make accurate factual decisions. In fact, some countries are experimenting with expertise at the trial level. To some extent, the United States is as well. A new pilot program allows each trial court to designate judges to hear patent cases.⁵³⁵ Cases will be distributed randomly among the judges of the court, but any judge assigned a patent case can have it reassigned to the designated judge. So far, judges in fourteen district courts have volunteered to become designated judges. It remains to be seen how many cases they hear, how expert they grow, and whether the Federal Circuit becomes less prone to reverse their decisions.

A second critique of the Federal Circuit is that it is overly enamored of patents as a means of promoting innovation. As noted above, the court has jurisdiction over issues other than patent law. However, it hears almost no competition law case or cases arising under other intellectual property laws. Because it tends to see patents as the sole means of promoting invention, its decisions have largely expanded the prerogatives of patentees at the expense of the public, including competitors. It is difficult to know whether this concern is valid, but the Supreme Court appears to think so. In recent years, it has stepped up its review of Federal Circuit cases and for the most part, it has reversed or otherwise modified the Federal Circuit's decisions. As described in Part II, it has repeatedly reversed the Federal Circuit on what constitutes

⁵³⁴ Rochelle C. Dreyfuss, 'What the Federal Circuit Can Learn From the Supreme Court—and Vice Versa' (2010) 59 *American University Law Review* 787.

⁵³⁵ United States Courts, The Third Branch News, District Courts Selected for Patent Pilot Program (7 June 2011) available at http://www.uscourts.gov/News/NewsView/11-06-07/District_Courts_Selected_for_Patent_Pilot_Program.aspx accessed 28 April 2013.

patentable subject matter,⁵³⁶ it has raised the inventive step,⁵³⁷ emphasized the equitable nature of injunctive relief,⁵³⁸ and expanded the exhaustion doctrine.⁵³⁹ It has also stretched the Bolar research exemption to cover some preclinical work⁵⁴⁰ and expanded standing to challenge patent validity.⁵⁴¹ Of course, it is possible that the Supreme Court, which is composed of generalists, has it wrong and the specialists on the Federal Circuit have it right. For that reason, some countries have considered specialization at both the trial and appellate level. However, any system that sees competition as a strong motivator of innovation should consider the Federal Circuit experience and be wary of overspecialization.

SUMMARY. At the end of the day, the better option may be to repose legal expertise (power to interpret patent law) in the patent office, rely on specialized trial courts with technical expertise to implement the law in specific cases, and permit review by generalist appellate courts. The appeals court would be highly deferential to patent office rules, but would be available to consider how patent law interfaces with competition policy, the public interest, and innovation policies that derive from other legal regimes.

B. Improving the interaction between competition law and IP law

There are various ways to improve the interaction between competition law and IP law.

First, one may conceive some cross-fertilization between the two fields from a substantive law perspective. Competition law may internalize IP values, such as the promotion of incentives to innovate in competition law enforcement. The call for competition law to move towards a more dynamic analysis that focuses on innovation, instead of static allocative efficiency, encapsulates the view that both disciplines should find some common ground, although for competition authorities the starting point remains the assumption that competition promotes growth and innovation.⁵⁴² IP law may also internalise competition law values by focusing on access and dissemination. We have previously explained the various doctrines of IP law enabling access and dissemination concerns to be taken into account (e.g. the experimental use exception, decompilation of parts of a software product, compulsory licensing, patent misuse doctrine). A recent report by the US FTC has also suggested the possibility for the Patent Office (PTO) to “consider possible harm to competition along with other possible benefits and costs, before extending the scope of patentable subject matter”.⁵⁴³ The Report also noted the necessity of expanding the consideration of economic learning and competition policy concerns in patent

⁵³⁶ *Mayo Collaborative Services v Prometheus Laboratories, Inc.*, 132 S.Ct. 1289 (2012); *Bilski v Kappos*, 130 S.Ct. 3218 (2010).

⁵³⁷ *KSR Int'l Co. v Teleflex Inc.*, 550 U.S. 398 (2007).

⁵³⁸ *eBay, Inc. v MercExchange, L.L.C.*, 547 U.S. 388 (2006).

⁵³⁹ *Quanta Computer, Inc. v LG Electronics*, 553 U.S. 617 (2008).

⁵⁴⁰ *Merck KGaA v Integra Lifesciences I, Ltd.*, 545 U.S. 193 (2005).

⁵⁴¹ *MedImmune, Inc. v Genentech, Inc.*, 549 U.S. 118 (2007).

⁵⁴² See, OFT 1390, Competition and Growth (November 2011) (noting the “wide range” of empirical studies examining the links between competition, innovation and productivity, which set, on the whole, a positive relationship between the three and at the micro level, examples of the positive impact of specific competition interventions on price, choice and innovation, which are “abundant”).

⁵⁴³ US FTC, ‘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 28 April 2013, Recommendations 6 and 10.

law decision-making. These recommendations insist on the importance of trans-disciplinary links between IP and competition law and confirm the thesis that intellectual property and competition law have become or are in the process of becoming a “unified field”.⁵⁴⁴

The integration of social science/economics learning in IP decision-making and adjudication remains however relatively marginal, in comparison to competition law. In the US, the PTO does not dispose of a rule-making function over questions of patentability, its authority being merely confined to the adjudication of disputes of patent validity. Certainly, the 2011 America Invents Act has conferred to the US PTO also the ability to conduct post grant review proceedings, available for a limited period of nine months after a patent was granted or re-issued, a process overseen by the Patent Trial and Appeal Board, but did not confer upon it any rulemaking authority. Courts, in particular the Federal Circuit, have generally been regarded as the dominant institution in the shaping of patent policy in the US.⁵⁴⁵ Yet, both the US PTO and the Federal Circuit lack economic expertise and are unable, under the current circumstances, to perform a sophisticated economic analysis of the effect of their activity on innovation, productivity and welfare. Responding to this concern over the lack of economic expertise, the US PTO established in March 2010 the Office of the Chief Economist (OCE), whose function is to initiate and oversee economic analysis in the field of intellectual property protection and enforcement and to feed into the advisory role of the USPTO to the President (via the Secretary of Commerce) and the administration with advice on the economics of intellectual property rights.⁵⁴⁶ The research programme set for the first chief economist related to macro-economic type of research on the relationship between economic growth, performance and employment, IP issues in a standard setting context, the economics of trademarks, the economics of the USPTO process and the role of IP in the markets of technology and knowledge. A report on Intellectual property and the US Economy, focusing on specific “IP intensive” industries was published in March 2012.⁵⁴⁷ It is not however clear if the position of the chief economist at the US PTO will evolve to a more permanent position with a more expansive role and intervention in the adjudicative process. This paucity of economic analysis contrasts with the very active role economists have been playing in the academic debates over economic analysis of IP rights.

In Europe, the integration of economic expertise seems more advanced, at least at the institutional level. The European Patent Office (EPO) established the position of a chief economist already in 2004. The chief economist is the executive secretary of the EPO's Economic and Scientific Advisory Board (ESAB), an institution created in 2011 and composed of 11 patent experts (a mix of economists, social scientists and practitioners), appointed for a period of three years.⁵⁴⁸ The Board advises the EPO on the scope and set-up of relevant economic and social studies, provides guidance on related research projects and evaluates their

⁵⁴⁴ W. K. Tom & J A. Newberg, ‘Antitrust and Intellectual Property: From Separate Spheres to Unified Field’ (1997) 66 *Antitrust Law Journal* 167.

⁵⁴⁵ A. Rai, ‘Patent Validity Across the Executive Branch: Ex Ante Foundations for Policy Development’ (2012) 61 *Duke Law Journal* 101 (noting also the increasingly important involvement of the Supreme Court in the area); Rochelle C Dreyfuss, ‘What the Federal Circuit Can Learn from the Supreme Court – And Vice Versa’ (n 534).

⁵⁴⁶ See, <<http://www.uspto.gov/ip/officechiefecon/>> last accessed 28 April 2013.

⁵⁴⁷ See, <http://www.uspto.gov/news/publications/IP_Report_March_2012.pdf> (the report use standard statistical methods to identify which US industries are the most patent-, trademark-, and copyright-intensive, and defines this subset of industries as “IP-intensive”).

⁵⁴⁸ See, <http://www.epo.org/about-us/office/esab.html> last accessed 28 April 2013.

impact. One of the first studies published by ESAB, for example, was on patent thickets, an issue of great concern also for competition law, as we have previously explained. ESAB is also expected to provide “early warning signals” on sensitive developments and issues and to operate as a platform for discussing the role of patents (applications) in the early stage of the innovation process and during application procedures at the EPO, the governance of the patent system and economic and social issues relating to the impact of patents after grant, such as “competition matters”. The two first chief economists of the EPO have also published one of the few books in Europe on the economic analysis of the European patent system, integrating a competition perspective.⁵⁴⁹

The Hargreaves report in the UK identified the lack of economic analysis as one of the major sources of the failure of public policy in this area and the lack of evidence-based policy-making, a point also frequently made in the past by other reviews of the IP system in the UK.⁵⁵⁰ Following proposals in 2006 by the Gowers Review, the UK government put in place in 2008 the Strategic Advisory Board for Intellectual Property (SABIP) with the aim to oversee a number of research projects on IP policy topics. However, the SABIP was not part of the IPO and did not contribute to the mainstream IP policy process in any area, resulting to its disbandment in 2010.⁵⁵¹ The Gowers report also led to the appointment of the first chief economist of the IPO in 2008 and the development of an IP economists unit [Economics, Research and Evidence (ERE)], to which some policy staff who have previously worked for the SABIP were integrated, thus shifting attention upon the economic aspects of IP.

The Hargreaves report also included a number of recommendations with the aim to “broaden the IPO’s vision” and to base IPO’s decision-making in evidence and the obligation to “take due account of the impact of the IP system on innovation and growth”.⁵⁵² The Hargreaves report recommended legislative changes that would add new functions to the IPO including (i) “a duty to keep under review the impact of IP and IPRs, and market positions founded on IPRs, on innovation and growth, including adverse impacts on competition and the competitive spur to growth, and to report annually”; (ii) “powers to prepare one off reports on specific areas or cases where there appears to be detriment to competition and consumer welfare”; (iii) “powers to require information to support the exercise of these reporting functions”; (iv) “powers to make recommendations to the competition authorities, and to fund investigations that competition authorities may make as a result, thereby recycling income from fees paid by rights holders in the interests of maintaining healthy and efficient markets, as well as servicing the needs of rights holders and applicants”.⁵⁵³

⁵⁴⁹ Dominique Guellec and Bruno van Pottelsberghe de la Potterie, *The Economics of the European Patent System: IP policy for innovation and competition* (Oxford University Press 2007).

⁵⁵⁰ Hargreaves (n 20) 91, “(e)ven where IP law is clear it is too infrequently grounded in evidence or directed to take account of economic priorities. This represents a failure of public policy” and p. 92, noting that the Banks Review in the 1970s “deplored the lack of evidence to support policy judgments” and that “(t)hirty years later, the Gowers Review in 2006 made the same point”, concluding that “our institutional framework appears to have failed to equip itself to conduct evidence-based policy effectively”.

⁵⁵¹ Ibid 92.

⁵⁵² Ibid 95.

⁵⁵³ Ibid.

Following the Hargreaves Report, the IPO was also asked to issue an annual report on the extent to which its activities have promoted innovation and growth, and, second, to improve its evidence base for policy making, in view of its rule-making functions and in particular to prepare impact assessments quantifying, if possible, the costs of policy changes and integrating in the published impact assessments a summary statement of the impact of the proposed policies on innovation and growth.⁵⁵⁴ It remains to be seen how these additional requirements will affect the activity of the IPO and the integration of economic learning.

A similar trend for more economic analysis in the IP offices can be observed in other jurisdictions. There are also economists in INPI Brazil, IP Australia, the Canadian office, OHIM, an observatory including economists at INPI France, the Swiss IP office and even in CIPO China. Furthermore, offices in Japan and Germany have close links to academic institutions which are almost as effective in terms of influence. WIPO has also recently strengthened its capability on both economics and statistics.

In comparison, the integration of social science research and economic expertise is particularly developed in the area of competition law. In the US, a significant part of the staff of the Antitrust Division of the Department of Justice and the FTC dispose of economic expertise and economists are particularly present in both the adjudicative and the rule-making functions of the authorities. At the FTC, the Bureau of Economics provides economic analysis and support to antitrust and consumer protection investigations and rulemakings. In the EU, a Chief Competition Economist' (CCE) office, was established in 2003, comprising a team of specialized economists, headed by a Chief economist who is appointed by the European Commission. The CCE's office fulfills a "support function", being involved in competition investigations and providing economic guidance and "methodological assistance", but also exercises a "checks-and-balances" function, giving the Commissioner an "independent opinion" before any proposal for a final decision to the College of Commissioners.⁵⁵⁵ The Chief economist also coordinates the work of the Economic Advisory Group on Competition Policy (EAGCP), which regroups a number of academic economists who have recognized reputation in the field of industrial organization, proposed by the chief economist and nominated by the Commissioner. The EAGCP prepares opinions on the projected reviews of EU competition law policies and regulations. The Commission's appointment of a Chief Economist reflects its responsiveness to changes in intellectual climate and economic theory. Many national competition authorities have followed the same path by appointing chief economists and by either establishing specific bureaus of economics or by integrating economists in the different case teams dealing with investigations.

A common emphasis on the economic effects of each policy on welfare and innovation may reduce the tensions between these two areas of law. Yet, there are limits as to what

⁵⁵⁴ IPO, The Role of the Intellectual Property Office (July 2012) available at <<http://www.ipo.gov.uk/hargreaves-roleofipo.pdf>> ; IPO, Response to the Informal Consultation on the Role of the Intellectual Property Office (March 2013) available at <<http://www.ipo.gov.uk/response-2013-roleipo.pdf>> last accessed 28 April 2013.

⁵⁵⁵ Lars-Hendrik Röller and Pierre A Buigues, 'The Office of the Chief Competition Economist at the European Commission' (May 2005) available at <http://ec.europa.eu/dgs/competition/economist/officechiefecon_ec.pdf> last accessed 28 April 2013.

economic analysis may offer for the development of a congruent approach to innovation across both fields. The IP system relies on a single set of rules that apply to all industries with relatively minor deviations, which is the result of the choice to limit administrative costs and ensure economies by making rules more general.⁵⁵⁶ Defining the optimal scope of the property rights on a case by case basis, taking into account its probable effect on innovation and welfare, might largely exceed the capacities of government authorities in charge of the development of IP law and might be extremely costly, in view of the number of patent applications (to give that as an example) and the limited amount of information at their disposal at the time of the grant of the patent. Empirical studies on the effect of different IP rights on the level of innovation per industry are scarce and not always conclusive. The best that can be done under the current institutional circumstances is to make efforts to integrate economic analysis in the design of optimal IP law regimes and rules, rather than in enforcing the standards of patentability, as it was suggested by the FTC. At the same time, the focus of the economic analysis might be different in the context of an IP office than in that of a competition authority. Although competition authorities increasingly recognize the importance of dynamic analysis and the objective of innovation, they cannot completely abandon static analysis of the effects of a practice on consumers, the latter being considered particularly important if the aim of competition law is to protect consumers from wealth transfers, in the absence of compensating qualitative efficiencies⁵⁵⁷. Competition law and IP agencies dispose of different types of expertise and functions, which are nevertheless complementary, as they enable achievement of dynamic efficiency at the lowest cost for allocative efficiency. There are thus reasons to avoid any significant duplication of tasks between the competition law and the IP authorities. There has nevertheless been some discussion over the integration of the different functions to the same agency or the development of an overarching innovation policy bureau that would coordinate innovation policy across different government bureaus and regulatory agencies (e.g. an Office of Innovation Policy).⁵⁵⁸ There are some examples of the integration of the IP and competition law enforcement in one authority (e.g. INDECOPI in Peru, yet this does not concern the award of IP rights).

Second, one might favour an institutional approach that would focus on the development of “trans-disciplinary links” between competition authorities and IP law offices,⁵⁵⁹ but also between executive agencies and the judiciary. In the US, it is clear that both the DOJ and the FTC have been particularly active in the area of IP rights. Yet, in recent years there has been increased cooperation between the Antitrust Division of the DOJ, the FTC and the USPTO. First, a joint workshop on promoting innovation was organized in 2010 by these institutions. Second, the DOJ Antitrust Division and the USPTO have coordinated their action with regard to standard

⁵⁵⁶ Christina Bohannon and Herbert Hovenkamp, *Creation Without Restraint: Promoting Liberty and Rivalry in Innovation* (Oxford University Press 2012) 341.

⁵⁵⁷ For a similar view, taking the perspective that the objective to protect consumers is a distributive justice aim (fairness) that may enter in conflict with intellectual property in some circumstances, see Daniel A Farber and Brett McDonnell, ‘Why (and How) Fairness Matters at the IP/Antitrust Interface’ (2003) 87 *Minnesota Law Review* 1817.

⁵⁵⁸ Stuart M Benjamin and Arti K Rai, ‘Fixing Innovation Policy: A Structural Perspective’ (2008) 77(1) *The George Washington Law Review* 1.

⁵⁵⁹ See also William E Kovacic ‘Competition Policy and Intellectual Property: Redefining the Role of Competition Agencies’ in Lévêque and Shelanski (eds) (n 129) 1, 9 (advocating “the development of new cooperative networks in which competition agencies work with collateral government institutions, such as rights-granting authorities, to study the interaction of these regulatory regimes”).

essential patents by adopting in January 2013 a joint policy statement on remedies for standard-essential patents subject to voluntary F/RAND commitments. The joint policy statement addresses whether injunctive relief or exclusion orders in International Trade Commission investigations are properly issued when the patent holder asserts standards-essential patents that are encumbered by a F/RAND licensing commitment and notes that monetary damages, rather than injunctive or exclusionary relief, should be the appropriate remedy for infringement.⁵⁶⁰ There have also been proposals for restructuring the relations between the various innovation policy institutions and organizing frequent consultations *ex ante* between the USPTO and the DOJ/FTC.⁵⁶¹

An illustration of this cooperation is that the European Patent Office submitted comments at the European Commission's Pharmaceutical Sector Inquiry,⁵⁶² in which the European Commission commented extensively on the EPO's process and suggested changes. An interesting institutional experiment came out of the Hargreaves report in the UK stressing the importance of competition as a necessary condition for innovation, enterprise and growth. Given the important role of competition, the Hargreaves report suggested the conferral of new functions to the IPO in this area, a proposal the government rejected as it would have jeopardized the independence of the competition authority. However, the competition authority in the UK (the Office of Fair Trading, OFT) agreed in 2012 to sign a non-binding Memorandum of Understanding (MoU) with the IPO putting in place a framework for a strengthened cooperation.⁵⁶³ Notable features of this MoU are the provisions on the sharing of information on specific complaints, policy proposals or developments of policy and regulation having an impact on IP and competition, common advocacy efforts, regular meetings (at least quarterly to discuss matters of common interest) and procedures for the IPO to refer to the OFT cases where it considers that there may be competition concerns. The appointment of liaison officers or staff in charge of the interaction between competition law and intellectual property in the different authorities may also enhance cooperation and mutual understanding.⁵⁶⁴

It is important to expand and deepen this cooperation by the constitution of networks of competition authorities and intellectual property offices at a regional or global scale. More importantly, the judiciary should not be left out, in view of the dominant role it has in the interpretation of the standards for benefitting from IP protection and the development of adequate remedies in case of IP infringement. For the time being, there are only some mechanisms to establish cooperation between the DG competition at the European Commission and national courts of the different Member States of the EU (presumably including those in

⁵⁶⁰ US DOJ & USPTO, 'Policy Statement on Remedies for Standard-Essential Patents Subject to Voluntary F/RAND Commitments' (8 January 2013) available at <<http://www.justice.gov/atr/public/guidelines/290994.pdf>> last accessed 28 April 2013.

⁵⁶¹ Arti K Rai, (n 545) 154.

⁵⁶² See, European Commission Pharmaceutical Sector Inquiry Preliminary Report –Comments from the EPO (28 November 2008) available at <http://ec.europa.eu/competition/consultations/2009_pharma/european_patent_office.pdf> last accessed 28 April 2013.

⁵⁶³ Memorandum of Understanding between the Intellectual Property Office and the Office of Fair Trading (July 2012) available at <http://www.oft.gov.uk/shared_of/MoUs/IPO.pdf> last accessed 28 April 2013.

⁵⁶⁴ See, for example, the establishment of an IP and Competition Policy unit at the Innovation Directorate of the Intellectual Property Office in the UK, or the creation of IP and innovation-focused units in competition authorities.

charge of IP law disputes).⁵⁶⁵ Training programmes for judges may also enhance their economic expertise, as well as their knowledge of competition law and IP law principles.

SUMMARY: The incorporation of social science input (in particular economics) in IP law is a crucial but also challenging endeavor that could eventually lead to less tensions between IP and competition law. Evidence-based and influenced policy making in both IP law and competition law may also set the basis for a more intense collaboration between the competition authorities and the IP offices.

VI. Conclusion

The intersection between competition law and IP gives rise to complex trade-offs between incentives to innovate and dissemination of innovation, static and dynamic efficiency, total welfare and the welfare of consumers and difficult choices between rules and standards, general rules versus specific IP law regimes, *ex ante* versus *ex post* approaches. The interaction of IP rights with the economically inspired competition law has also led to an effort of re-conceptualization of this area of law from an economic perspective, for a long time absent from the day to day activity of the IP offices and courts in interpreting and delimiting IP boundaries in various economic sectors. Patent law has of course been the area of predilection of this more economic approach with an increasing number of economic and empirical studies examining the real effect of the IP rights granted to innovation and welfare.⁵⁶⁶ From this perspective, the dialectical relation between these two disciplines has been an opportunity for re-conceptualizing IP rights and the property rights analogy that has for a long time provided the unifying narrative of this area of law.

This transformation of IP law is visible in the way the classic opposition in law and economic literature of property rules and liability rules took hold in order to explain the frequent limitations incurred by IP holders on their rights to exclude others from using their invention and enjoining the fruits of their investment by receiving an important compensation in the form of royalties.⁵⁶⁷ The property rights analogy challenged, it appeared that the relation between property rules and liability rules for the protection of information forms a *continuum*: “when an innovator is forced to license its innovative technology, the protection afforded to him degrades

⁵⁶⁵ For example, Article 15 of Regulation 1/2003 on the enforcement of EU competition rules provides that the European Commission (the Directorate General on Competition) can transmit information to the national courts, give its opinion on questions regarding the application of the EU competition rules, submit observations to national courts as *amicus curiae*, the national courts being obliged to submit to the Commission a copy of their judgments touching upon issues of competition.

⁵⁶⁶ See, for instance, Michele Boldrin and David K Levine, ‘The Case Against Patents’ (September 2012) Federal Reserve Bank of St Louis Working Paper 2012-035A available at <<http://www.research.stlouisfed.org/wp/2012/2012-035.pdf>> accessed 28 April 2013; James Bessen and Michael J Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk* (Princeton University Press 2009); Guellec and van Pottelsberghe de la Potterie, (n 549); Jaffe and Lerner (n 138); Suzanne Scotchmer, *Innovation and Incentives* (MIT Press 2004).

⁵⁶⁷ Guido Calabresi and A Douglas Melamed, ‘Property Rules, Liability Rules and Inalienability: One View of the Cathedral’ (1972) 85(6) *Harvard Law Review* 1089; Mark A Lemley and Phil Weiser, ‘Should Property or Liability Rules Govern Information?’ (2007) 85 *Texas Law Review* 783.

from a property rule to a liability rule”.⁵⁶⁸ The emphasis on the cumulative nature of innovation contributes to this re-conceptualization of IP rights across these two poles. More importantly, the opposition between property rules and liability rules may provide a unifying theoretical framework for the analysis of the effects of different forms of protection of innovation to the IP rights holders. At one side of the *continuum*, patents provide the possibility to the IP holders to exclude imitators and duplicators by the award of an exclusive right to enjoin others from the use and commercialization of the invention, even if the infringer has duplicated the invention by her own effort; At the other side of the spectrum, trade secrets do not protect the inventors against independent discovery and duplication through reverse engineering; Copyright protects the expression of an idea, hence does not exclude the parallel development of an invention, although “it tends to put restrictions on reverse engineering (“circumvention of digital locks”)”.⁵⁶⁹

These different efforts of conceptualization of different forms of IP rights denote the challenge of constructing a theoretical framework that takes into account that the process of innovation does not only include the standalone invention step but also those of cumulative innovation, dissemination and commercialization to the benefit of consumers and society at large. The traditional conception of IP rights as property rights may not provide an accurate description of the innovation process and might lead to favor some actors in this process to the detriment of others.

One might be tempted to address IP law as a form of regulation: IP rights impose obligations on third parties, not as a consequence of a contract, tort or voluntary exchange, but because of the direct intervention of the government which aims to stimulate particular activities to foster the general welfare.⁵⁷⁰ By conferring property rights on ideas, the government does not only seek to facilitate market transactions, as is the case for physical property rights, but also to correct a market failure, which is in this case “free riding that occurs when innovations are too easily copied, and the corresponding decrease in the incentive to innovate”.⁵⁷¹ Hovenkamp observes,

“IP laws create property rights. But so do state created exclusive franchises and filed tariffs. In fact, the detailed regulatory regimes that we call the IP laws are filed with very rough guesses about the optimal scope of protection – ranging from the duration of patents and copyrights to the scope of patent claims and fair use of copyrighted material. The range of government estimation that goes on in the IP system is certainly as great as in regulation of, say, retail electricity or telephone service. Further, the IP regime is hardly immune from the legislative imperfections that public choice theory uncovers”.⁵⁷²

⁵⁶⁸ Vincenzo Denicolò and Luigi Alberto Franzoni, ‘Rewarding Innovation Efficiently – The case for Exclusive Rights’ in Manne and Wright (eds) *Competition Policy and Patent Law Under Uncertainty: Regulating Innovation* (n 252) (Cambridge University Press 2011), 287, 289.

⁵⁶⁹ Ibid 290.

⁵⁷⁰ See, for instance, Ioannis Lianos, ‘Competition Law and Intellectual Property Rights: Is the Property Rights’ Approach Right?’ in John Bell and Claire Kilpatrick (eds) 8 *The Cambridge Yearbook of European Legal Studies* (Hart Publishing 2006) 153.

⁵⁷¹ Hovenkamp, *The Antitrust Enterprise—Principle and Execution* (n 141) 228.

⁵⁷² Ibid 337.

Other authors have criticized the reward theory of patents, which “emphasises only one dimension of the patent instrument – compensation for innovation – and ignores the role of patents as means of regulating markets”.⁵⁷³ The same point is also made by Bently and Sherman for whom patents are “regulatory tools” which are used by governments in order to achieve economic as well as non-economic ends.⁵⁷⁴ For example, the patent offices should also take into account “the external effects of the impact of technology on the environment or health”.⁵⁷⁵

Furthermore, Burk and Lemley argue that patent law is an industry and technology-specific regulation.⁵⁷⁶ Different patent theories, such as prospect patents, incentives, cumulative innovation and anti-commons operate differently according to the particular industry’s settings.⁵⁷⁷ Exploring the enforcement of patents in the US, Burk and Lemley identify several “policy levers,” which help the patent offices and the courts to frame IP doctrines which correspond to the needs of cumulative innovators and the consumers.⁵⁷⁸ The existence of sector-specific IP protection on semi-conductors, software, medicinal products and biotechnology in Europe may better illustrate the point.⁵⁷⁹

Taking a regulatory perspective on IP enables us to conceptualize the interaction between competition law and IP as a dimension of the relation between government activity and competition. If one takes a public choice perspective, it is possible to argue that any form of state intervention in the marketplace carries the risk of capture and inefficiency: there is a wealth of empirical literature on the inefficiency of sector specific regulations, but similar claims have also been made with regard to competition law.⁵⁸⁰ The burden of proof is on the State to establish the need of its intervention through competition law or through the grant of an exclusive right, here an IP right for innovation purposes, and the standard of proof is set high, on the assumption that the self-correcting mechanism of the market will take care of any eventual failure, in the absence of state interference. Such an approach leads essentially to subject state intervention to a stricter competition assessment than private action, as by essence the monolithic (and monopolistic) nature of government intervention departs more from the optimum of competitive markets (and the standard of perfect competition) than even concentrated private market structures. Yet, it is also clear that from this perspective the field left to competition law versus other forms of state

⁵⁷³ Shubba Ghosh, ‘Patents and the Regulatory State: Rethinking the Patent Bargain Metaphor After Eldred’ (2004) 19 Berkeley Technology Law Journal 1315, 1351.

⁵⁷⁴ Lionel Bently and Brad Sherman, *Intellectual Property Law* (2nd ed., Oxford University Press 2004, now in its 3rd edition, 2008) 329.

⁵⁷⁵ *Ibid*

⁵⁷⁶ Dan L Burk and Mark A Lemley, ‘Policy Levers in Patent Law’ (2003) 89 Vanderbilt Law Review 1575.

⁵⁷⁷ *Ibid* 1615-1630.

⁵⁷⁸ *Ibid* 1687-1689 (e.g. while it is necessary to assure a broad patent protection for biotechnological and chemical inventions, “because of their high cost and uncertain development process”, this is not the case for software industry).

⁵⁷⁹ Council Directive 87/54/EEC of 16 December 1986 on the legal protection of topographies of semiconductor products [1987] OJ L24/36; Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs [1991] OJ L122/42 (now replaced); Council Regulation 1768/92/EEC of 18 June 1992 concerning the creation of a supplementary protection certificate for medicinal products [1992] OJL 182/1; Directive 98/44/EC (n 31).

⁵⁸⁰ Fred S McChesney and William F Shughart II (eds), *The Causes and Consequences of Antitrust: the Public Choice Perspective* (University of Chicago Press 1995).

intervention, such as IP law, remains open for negotiation, a negotiation conducted through and according to the rules of the communicating tool of welfare economics.

As a result, of a greater recourse to economics in public policy, the IP offices/authorities' bureaucracy see also its role change, as it is gradually transformed from a structure performing merely tasks of execution, involving a formalistic check of the conditions of patentability by looking to a close evidential environment (defined by the prior art) to a more pro-active technocracy, assuming more often tasks of forecast, knowledge gathering/sharing with regard to the effects of the IP system on economic efficiency, welfare and innovation. The establishment of economic units within the IP authorities and economic and scientific advisory boards illustrates the gradual transformation of IP bureaucracy towards a more regulatory setting. Should they integrate more systematically dynamic economic analysis in their day to day work (through sector studies and empirical work), IP authorities (e.g. patent offices) may develop superior expertise than competition authorities or court, not only on the innovative nature of the patented technologies but also on the characteristics and conditions of the industry as a whole. This evolution towards a more regulatory IP law framework would, no doubt, alter the balance between the patent and IP offices and the courts, which enjoyed a dominant role in the interpretation and framing of IP law doctrine. If this hypothesis is confirmed, IP offices might be better placed to assess the welfare effects of their interventions on dynamic efficiency than competition authorities and courts. If there would be any claim for an antitrust authority to intervene in this configuration that would only happen, under this approach, because of the superior economic expertise of the antitrust authority on the specific matter or the fact that it responds *ex post* to an abuse of the IP process.

A regulatory approach to IP will also enable crucial reforms in the way patent offices operate: first, as this has been illustrated by the recent reforms introduced at the USPTO, such as the post grant review of patents, the IP authorities see their adjudicatory powers extended, which at the same time provides an additional forum *ex post* to challenge the exclusionary effect of patents, by contesting their validity, thus dealing with the eventual competition law problems that might arise from the awarded patent within an IP setting. Second, as the discussions over vesting the USPTO with substantive rule-making authority at the passage of the America Invents Act show, patent offices may potentially become the hub of an innovation centred regulatory nexus, comprising competition authorities, sector specific regulators (e.g. telecom regulator), the food and drug administration, among others, with the aim to develop a coherent innovation policy that employs all the legal instruments at the disposal of the state in order to promote innovation to the benefit of consumers and society at large.

Finally, a regulatory approach to IP enables the consideration of the tensions between incentives to innovate and dissemination of innovation on a conceptual neutral theoretical framework. IP law and policy has a specific function and should not be considered as a facet of competition policy⁵⁸¹.

⁵⁸¹ See the recent judgment of the Court of Justice in Joined Cases C-274/11 & C-295/11, *Spain v. Council and Italy v. Council* [April 16, 2013, not yet published], para. 22, on the shared or exclusive nature of the competence of the EU in the establishment of a unitary patent protection, following the enhanced cooperation initiatives of some Member States, the Court held that the relevant provision for the creation of centralised IP rules fell outside Articles 101 to 109 TFEU [the EU competition rules] and thus the exclusive competence of the EU, noting that “[a]lthough it

The intersection of IP law with competition law has also led to a re-examination of competition law's traditional focus on static allocative efficiency. Dynamic analysis has made inroads into merger analysis and is increasingly considered as essential also for the competition law assessment of unilateral conduct, at least theoretically. Practically, however, there are few instances competition law has incorporated systematically dynamic analysis and the focus on dynamic efficiency. There are many reasons for this.

First, from an institutional perspective, courts are considered as less able to conduct the sophisticated analysis required in this context.⁵⁸² The adjudicative process limits the type of evidence heard by the court: this should relate directly to the dispute and is brought by the parties to the dispute. This may not include the effect of the specific practice on consumers in related relevant markets, future generations of consumers or the general public. Competition authorities, the dominant enforcement actor in Europe, are better placed than courts to conduct this type of complex polycentric economic analysis, as they dispose of in house economic expertise and the powers to investigate different sectors of the economy (through sector inquiries). Their intervention as *amicus curiae* in IP law related judicial disputes, each time competition law concerns arise, may be an effective way to influence the IP adjudication process to a more competition friendly approach. Their collaboration with the patent and other IP offices within the innovation regulatory nexus may also enhance a more systematic consideration of dynamic efficiency concerns in competition law analysis, in particular if the IPO offices conduct periodic empirical and economic analyses on the effect of patents on the level of innovation in various industries. The constitution of a common evidence base between competition authorities and IP offices, resulting from the competition authorities' and IP offices' sector inquiries, which would feed in their rulemaking and adjudicatory process constitutes an additional means to ensure the congruence of their action.

Second, from a substance perspective, competition authorities do not dispose of the means, tools and methods to conduct systematic dynamic competitive analysis on a case-by-case basis. Authorities operate in an adjudicatory context with strict deadlines and a limited timeline for making decisions. Dynamic analysis is occasionally added after the competition authority has completed a static analysis, but it is not incorporated directly in their economic analysis of the competitive situation at the outset.⁵⁸³ At the same time, in what has been named the "new economy", network effects are prevalent and in combination with intellectual property rights they may harm consumers and ultimately innovation.⁵⁸⁴ Yet, the use of the tools of dynamic and

is true that rules on intellectual property are essential in order to maintain competition undistorted on the internal market, they do not, for all that [...] constitute 'competition rules' for the purpose of Article 3(1)(b) TFEU".

⁵⁸² Geoffrey A Manne and Joshua D Wright, 'Innovation and the Limits of Antitrust' (2010) 6 Journal of Competition Law & Economics 153.

⁵⁸³ Joseph A Schumpeter, *History of Economic Analysis* (Routledge 1986, first published in 1954), p. 1126, noting the importance of sequence analysis and observing as to the history of economic thought that "however important those occasional excursions into sequence analysis may have been, they left the main body of economic theory on the 'static' bank of the river; the thing to do is not to supplement static theory by the booty brought back from these excursions but to replace it by a system of general economic dynamics into which statics would enter as a special case".

⁵⁸⁴ Daniel J Gifford and Robert T Kudrle, 'Antitrust Approaches to Dynamically Competitive Industries in the United States and the European Union' (2011) 7(3) Journal of Competition Law & Economics 695; Ilya Segal and Michael D Whinston, 'Antitrust in Innovative Industries' (2007) 97 American Economic Review 1703.

stochastic efficiency analysis is not widespread among competition authorities and the data required for doing a more sophisticated analysis are unavailable in most cases. The law of evidence may also pose hurdles to the submission of econometric evidence, which is the statistical complement of a dynamic theory of competition.⁵⁸⁵

The different presumptions and rules on inferences applying in competition law and IP law operate thus as a second best, less costly but of course more prone to errors, option to an extended and complex dynamic economic analysis that the current institutional setting and the tools at its disposal may not be ready to provide. Consequently, both disciplines should take stock of their own imperfections in their mutual interaction with each other.

Yet, what appears important for both disciplines to take into account is the changing environment of the sources of innovation. Schumpeter emphasized the role of the entrepreneur and opposed the active role she or he plays in the innovative process to the passive role of the consumer.⁵⁸⁶ His point was that most innovation is entrepreneur-generated. This view accommodates the perception that the main actor in the innovation process is the inventor (or more broadly the entrepreneur) and that law should provide the right set of tools in order to enhance his or her inventive activity. One could compare this entrepreneur/inventor centered view of innovation to the increasing role of consumer-generated innovation. As it has been noted in the Hargreaves report, the focus on services instead of products is one of the major characteristics of the “new innovation process”:

“(s)ervices are usually produced at the point at which they are consumed: the act of consumption rather than invention is the focal point for innovation [...] (n)ew services are developed using a ‘market facing’ approach, often connected to information databases generated by people and organisations that articulate and express their requirements and demands as they experience the innovation. This is sometimes described as a more democratic approach to innovation, where companies trial different approaches – such as beta versions of web pages – and respond to user feedback”.⁵⁸⁷

Users participate to the development of innovation in the market.⁵⁸⁸ This should presumably get them a better share of the surplus innovation creates (in the form of choice, lower prices etc) Sometimes, the fact that innovation was consumer driven may affect the way competition law is enforced: in the *IMS/NDC Health* case relevant to the application of Article 102 to a refusal to license (see our analysis above), the Court of Justice of the EU observed that the brick structure to which *NDC Health* wanted to have access was created with the assistance

⁵⁸⁵ See, for instance, the empirical analysis of Ioannis Lianos and Christos Genakos, ‘Econometric Evidence in EU Competition Law: An Empirical and Theoretical Analysis’ (1 October 2012) CLES Research Paper series 06/12. Available at SSRN: <<http://ssrn.com/abstract=2184563>> or <<http://dx.doi.org/10.2139/ssrn.2184563>> accessed 28 April 2013.

⁵⁸⁶ Schumpeter (n 6).

⁵⁸⁷ Hargreaves (n 20) 14.

⁵⁸⁸ Eric von Hippel (n 21); Fred Gault and Eric von Hippel, ‘The Prevalence of User Innovation and Free Innovation Transfers: Implications for Statistical Indicators and Innovation Policy’ MIT Sloan School of Management. Research Paper No. 4722-09 (January 2009) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1337232 accessed 28 April 2014; Strandburg K J, ‘Users as Innovators: Implications for Patent Doctrine’ (2008) 79 University of Colorado Law Review 467.

of consumers who provided data on their consumption habits and became for that reason an indispensable input for the provision of the services in the downstream market of regional sales data on pharmaceutical products.

Another important source of change is what some have called “IP without IP”, intellectual production without intellectual property in order to describe the many instances in which the process of creativity does not rely as such on the award of intellectual property rights.⁵⁸⁹ The open access movement in software,⁵⁹⁰ the “piracy paradox” in the fashion industry,⁵⁹¹ to name but a few examples, illustrate that innovation may be the product of cooperation and sharing without the protective net of exclusivity rights and that the quest of monetary profits is not the only determinant of incentives to innovate.⁵⁹² As it noted in the Hargreaves report,

“The nature of services innovation implies that answers to technical problems will not lie exclusively within research institutions or companies with proprietary R&D cultures and the means to manage and protect IP. Instead, they will emerge through integration of ideas from a wide range of organisations, some of whom may consider managing IPR to be an unacceptable obstacle in a high value business, raising further challenges to traditional concepts of ownership of IP”.⁵⁹³

Although it is clear that these open innovation systems are “functionally dependent” on copyright, patent, trademark, or trade secrecy law,⁵⁹⁴ relying on the traditional “property rights” approach to IP presents the risk that this important dimension of this “new innovation process” will be ignored. The regulatory perspective to IP law mitigates that risk and provides a richer theoretical framework for the intersection of competition law with IP law.

⁵⁸⁹ Dreyfuss, ‘Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm’ (n 22) referring to a term coined by Mario Bagioli.

⁵⁹⁰ See, for instance, Josh Lerner and Jean Tirole, ‘The Economics of Technology Sharing: Open Source and Beyond’ (2005) 19 *Journal of Economic Perspectives* 99.

⁵⁹¹ See, for instance, Kal Raustiala and Christopher Sprigman, ‘The Piracy Paradox: Innovation and Intellectual Property in Fashion Design’ (2006) 92 *Vanderbilt Law Review* 1687.

⁵⁹² Yochai Benkler, ‘“Sharing Nicely”: On shareable goods and the emergence of sharing as a modality of economic production’ (2004) 114 *Yale Law Journal* 273; Lerner and Tirole (n 590).

⁵⁹³ Hargreaves (n 20) 14.

⁵⁹⁴ Dreyfuss, ‘Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm’ (n 22).

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