

Patents and Standardisation: Competition Concerns in New Technology Markets

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New technology markets, such as communication technologies or computers, are based on innovation and interoperability. To ensure that competition works properly in these markets, it is essential that market players have access to technologies which are protected by intellectual property rights, such as patents. Accordingly, when a technology is standardized, standard-essential patents (SEPs) owners have an obligation to disclose their patents and ask for fair, reasonable and non-discriminatory (FRAND) fees. But SEPs owners may engage in conducts which contravene these obligations, such as patent ambush, refusal to supply or abusive lawsuits for patent infringement. On the ground of article 102 of the Treaty on the Functioning of the European Union and Section 2 of the Sherman Act, competition authorities subject these practices to the competition principles. But the complexity of these matters and the unsuitability of the legal framework hinder the efficient application of the competition rules. As a result, competition authorities and courts struggle to prove the anticompetitive effects of these conducts and to interpret FRAND commitments.

I. Introduction

The interactions between Intellectual property rules, especially those concerning patents, and competition principles have led to a huge number of decisions from competition authorities and courts. The reason why this issue has raised a large number of concerns is the apparent contradiction between patents and competition concerns. On the one hand, patents, and intellectual property rights (IPRs) in general, give to their owner a legal right to prevent their competitors from using their invention. Thus, patents give to their

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owner a *de facto* monopoly on a technology for a limited period of time (twenty years from the filing date). On the other hand, the fundamental principle of competition is open access to market. Monopolies are broadly considered as potentially anticompetitive. For example, in the context of mergers, the creation of monopolies will always lead to commitments in order to ensure that competition is viable. In the context of abuse of dominance, the mere fact of enjoying a monopolistic position is not an abuse *per se*, but the strong market power of an undertaking will heavily influence the final decision of competition authorities.

Thus, the law seems to be contradictory: it gives to inventors exclusive rights on their invention, but these rights may lead to defiance from competition authorities when they are used in a market. Therefore, in markets based on technology and innovation, which involve a broad use of patents, competition problems are very likely to arise. Two main competition concerns have been identified by the legislator and the courts, both in the United States (US) and in the European Union (EU): agreements between undertakings and abuse of dominant position. When licensing their patents or agreeing to a standard, undertakings adopt collusive behaviour that may influence final prices and production. When refusing to license their patent to a fair, reasonable, and non-discriminatory (FRAND) rate or threatening their competitors by filing court proceedings, undertakings may abuse the dominant position they have acquired with their patents.

The issue of transfer of technology agreements between competitors has given rise to a lot of debates before courts and competition authorities in both sides of the Atlantic Ocean. Bright line rules have been drawn about the kind of behaviours or agreements that are forbidden. In the EU, for instance, the Commission's guidelines on horizontal agreements (hereafter the '2011 Guidelines')¹ and regulation 772/2004² on technology transfer agreements give clear rules for law practitioners and undertakings to follow.

More recent and more controversial is the application of anti-monopoly rules to patent owners in new technology markets. Both in the EU and in the US, several attempts to tackle abusive behaviour have been made on the

¹ Communication from the Commission – Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements [2011] OJ C 11/1 (2011 Guidelines).

² Commission Regulation (EC) N° 772/2004 of 27 April 2004 on the application of article 81(3) of the Treaty to categories of technology transfer agreements [2004] OJ L123/11.

ground of anti-monopolisation provisions, namely article 102 of the Treaty on the Functioning of the European Union (TFEU) and Section 2 of the US Sherman Act. The central question is whether a patent owner has the right to use its legal monopoly in a way which damages competition, slows down innovation and rises prices. Only a deep analysis of the relevant legal provisions and decisions can lead to an answer.

Another fundamental question is the meaning of FRAND. Competition can only be effective if manufacturers can have access to patented technologies in reasonable conditions. Unreasonable licensing fees may have a negative impact on markets, because they prevent competitors to use and develop technologies and thus limit innovation and production and rise prices to the expense of consumers. Thus, it may be useful to define the notion of FRAND.

Therefore, this article will focus on the dominance created by the grant of a patent and the abuse that have been detected and sanctioned by competition authorities and courts in the US and the EU. The analysis will focus on new technology markets that are driven by innovation and, therefore, patent protection.

For the purpose of this paper, the words ‘New technologies’ and ‘High tech’ are used interchangeably to refer mainly to new technology of information and communication and includes electronic devices used for communication and information such as phones, computers or communication protocols.

First, some of the main features of new technology markets will be presented, in order to understand the context in which competition problems are likely to arise (section II). The aim of the second part is to analyse the anticompetitive behaviours of patent owners in the context of standardisation and to demonstrate that anti-monopoly rules are very difficult to apply in this context (section III). Finally, this article will focus on the concept of FRAND and explain why a better definition of this concept would be helpful to efficiently apply competition rules (section IV).

II. The main characteristics of new technology markets

1. Innovation and competition: the importance of IP rights in new technology markets.

a) Patented technologies

With the fast development of new technologies, innovation has become a major concern for high-tech companies, which need to protect their innovative efforts. The best way to protect inventions is to obtain patents, which secure a legal monopoly to the benefit of the inventors. The law, in the US as well as in Europe, gives to patent owners a strong protection for their invention. For example, in the UK, every person which ‘makes, disposes of, offers to dispose of, uses or imports the product or keeps it whether for disposal or otherwise’ without the consent of the patent owner can be sued for patent infringement.³

Patents are the key for innovation because their reward is a strong incentive to innovate. Therefore, patents are very important in the high-tech sector, and smartphones, computers and every new technology devices in general can be defined as bunches of patented components. All these products are made of thousands of spare components and technologies, which are, for the most of them, covered by patents. For example, the number of patents that influence smartphone devices is estimated at several hundreds of thousands.⁴

Moreover, the patent systems in the US and in the EU are now quite flexible about what constitutes a ‘new’ invention, and programs for computers can be easily patented. In the US, the Supreme Court held in the 1981 landmark case *Diamond v Diehr* that the mere presence of a software element did not make an otherwise patent-eligible process non-patentable, and this position has not been challenged since then.⁵ In Europe, the European Patent Office has also adopted a flexible interpretation of the European patent convention, and it is therefore possible to be granted patents for minor technological inventions, including in the field of computer programs as long as they involve a physical hardware embodiment⁶. Moreover, given the complexity of these technologies, it is often very difficult for patent officers to really

³ Patents Act 1977, s 60(1).

⁴ According to the website TechDirt, more than 250000 patents concern smartphone technology, and they represent about 1 of 6 active patents. See Mike Masnik, ‘There Are 250,000 Active Patents That Impact Smartphones; Representing One In Six Active Patents Today’ (Techdirt, 2012) <<http://www.techdirt.com/blog/innovation/articles/20121017/10480520734/there-are-250000-active-patents-that-impact-smartphones-representing-one-six-active-patents-today.shtml>>, accessed 5 December 2013.

⁵ *Diamond v Diehr* [1981] 450 US 175.

⁶ T 258/03 *Auction Method/Hitachi* [2004], Decision of a Technical Board of Appeal of the European Patent Office.

understand the scope of the inventions or to assess their novelty or inventive step.

Patents protect technologies that may have a great value on the market. Some of them cover core technologies or have a widespread use, and have thus an important value, whereas some others concern minor features or outdated technologies and have a less important value. The value of a patent may also depend on its breadth. A broad patent,⁷ which can be used in a large number of devices or which covers a core technology, will usually have a very strong market value and will give an important competitive advantage to its owner, which will have the ability to control the market in that respect. As shown by patent economists Merges and Nelson, broad patents may hinder innovation because they tend to block access to technology by covering a full range of possibilities that were not originally imagined or by limiting the improvement of the protected technology.⁸ It is thus essential that the owners of broad patents grant access to their technologies through licensing agreements.

b) Licensing, cross-licensing and pooling

High tech devices usually combine hundreds of different technologies. These technologies are protected by patents, which are owned by different entities. Therefore, it is impossible to build new technology devices without obtaining first the agreement of all the patent owners, through licensing arrangements. In return, patent owners can ask for licensing fees, which are calculated according to the market value of their patents.

Companies can also choose to cross-license their patents. This is a good solution for industrial patent owners, which are involved in the development as well as in the manufacturing of devices. These companies may offer to license parts of their patent portfolio and obtain as a counterpart the right to use patents of other companies, without paying royalties. Thus, the parties are able to use their own patents as well as those of their competitors. This

⁷ The breadth of a patent depends on its scope, which is determined by the claims contained in the patent. The broader the scope of a patent, the larger the number of products that are likely to infringe the patent. Broad patents tend to block technologies because companies which try to innovate in the concerned technologies are very likely to infringe these patents and be sued by their owners.

⁸ Robert Merges and Richard Nelson, 'Market Structure and Technical Advance: The Role of Patent Scope Decisions' in Thomas M Jorde and David J Teece (eds), *Antitrust, Innovation and competitiveness* (Oxford University Press 1992).

system allows a fast and fair sharing of technologies, and is also an excellent way to combine technologies within devices. Finally, as noted by Shapiro, cross-licensing is also a tool used by competitors to ‘clear blocking patent positions amongst themselves’. Instead of wasting time and money in long-standing negotiations on the pricing of large patent portfolios, companies may rather opt for a cross-licensing regime, which give them access to the technologies of their competitors.⁹

A variant of cross-licensing, which is also used to share technology, is patent pooling. Patent pools are created by several companies, usually competitors, which decide to cross-license their patents between each other in order to develop new technologies and products. The specificity of patent pooling is that, usually, the covered patents are managed by a single entity, which license them ‘as a package’ to third parties.¹⁰ The first patent pool was created in the middle of the nineteenth century as regards the invention of sewing machine. Several individuals hold patents that, combined altogether, allowed the creation of sewing machines with their essential features. After several years of blockage, the patent holders finally decided to pool their patent and license it on fixed fees.¹¹ Patent pools are now used in the new technologies, especially in the telecommunication or media storage sectors.¹²

It must be noted that patent pools are agreements by which competitors decide to share their technologies and fix a single, flat royalty rate. It is therefore likely to raise competition concerns. However, both in the EU and in the US, competition authorities have acknowledged the procompetitive advantages of such mechanism, and clearance has been granted to most of patent pooling projects.¹³ For instance, US competition authorities

⁹ Carl Shapiro, ‘Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting’ (2001) 1 *Innovation Policy and the Economy* 119.

¹⁰ *ibid.*

¹¹ Intellectual Property Office, ‘Patent Thickets, an Overview’ [2011], available at <http://www.ipo.gov.uk/informatic-thickets.pdf>, accessed 5 December 2013.

¹² One example of is the MPEG-2 pool. The MPEG standard is a video standard used to digitally display or store video on televisions, computers or smartphones and most of the industry players are members of this pool. This pool was at the centre of deep antitrust concerns in the US, when its members forced licensors to pay for licences that have expired or were nearly expired.

¹³ See, for example, the ‘comfort letters’ addressed by the EU Commission to patent pools created by competitors as regards licensing programs for the DVD technology (‘Commission approves a patent licensing programme to implement the DVD standard’, IP/00/1135, 9 October 2000, http://europa.eu/rapid/press-release_IP-00-1135_en.htm) or

recognised that patent pools ‘provide competitive benefits by integrating complementary technologies, reducing transaction costs, clearing blocking positions, and avoiding costly infringement litigation’.¹⁴

c) Patent thickets and Patent trolls

One of the main features of new technology products is that they use thousands of components, which are, for the most of them, patented inventions. Innovative companies systematically apply for patents every time they invent a technological feature, including minor improvements or modification of former inventions. Consecutively, a large number of licenses can be necessary in order to produce high tech devices.

This multiplication of patented inventions has led to the creation of what is known as ‘patent thickets’. The concept of patent thicket has been defined by Shapiro as ‘a dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology’.¹⁵

The main characteristic of patent thickets is that they concern technologies, for instance telecommunication or pharmaceutical products, for which intellectual property rights are highly fragmented between several entities and may overlap. The consequence is that entities which want to develop a technology or to produce a device using a technology may be blocked because of the difficulty to identify all the relevant patents and the risk of patent infringement.

Moreover, high-tech companies now use patents not only as a defensive tool, but also as a commercial weapon: obtaining patents for every improvement or modification of a technology is an easy way to block access to a technology and to obtain money or access to other technologies in return of licensing agreements.

However, there are several backlashes. Because of the fragmentation of IPRs, dozens of patents may concern a single technology. For example, the

3G mobile technology (‘Antitrust clearance for licensing of patents for third generation mobile services’, IP/02/1651, 12 November 2002, http://europa.eu/rapid/press-release_IP-02-651_en.htm).

¹⁴ Department of Justice and Federal Trade Commission, ‘Antitrust guidelines for the licensing of intellectual property’ [1995] section 5.5.

¹⁵ Carl Shapiro, ‘Navigating the Patent Thicket’ (n 9).

3G communication technology is covered by more than 6 000 individual patents which belong to around 70 different companies or consortia.¹⁶ Then, all the patent owners must agree to license or cross-license their patents to produce a device using this technology, or even to create improvements of this technology (the use of a patented technology must be authorised by the patent owner, even if it is just for research and development purpose, as long as the final purpose is market access).

Patent thicket is widely considered as negative for the development of new technologies. Companies which want to use or work on a new technology may be prevented from doing it because of the difficulty to identify which patents are used in a technology and the high risk of patent infringement. The risk is that some undertakings are preventing from entering a market because they do not have a patent portfolio. In addition, because thousands of licences may be necessary to produce a technological device, the price of production of these products may also increase. Thus, patent thickets are likely to slow down the development and the marketing of new technologies and have a negative impact on final prices.¹⁷

In a thicket, many different entities with different goals coexist. Some entities are industrial players which create and share technology in order to produce new devices. For example, Apple or Samsung can be identified as leaders in the industry of computers or smartphones. Some other companies do not have any production activity and just buy patented technologies in order to obtain royalties in exchange of the use of their patents. They are only active on a patent market and they usually buy patent portfolios from industrial companies which go bankrupt.

The only goal of these companies, commonly known as patent trolls (or in a more official language ‘Patent Assertion Entities’¹⁸), is to license their patent portfolio to industrial players in order to obtain licensing fees and, in some extreme situations, threaten or sue companies which use their patents. A common practice of patent trolls is to wait for industrial players to

¹⁶ Isabelle Liotard, ‘Persistance et Intensité des Conflits Entre Normalisation et Propriété Intellectuelle: les Enseignements de la 3ème Génération de Téléphonie Mobile’ (2008) 22(1) *Revue Internationale de Droit Economique* 47.

¹⁷ See Intellectual Property Office, ‘Patent Thickets, an Overview’ (n 11).

¹⁸ Terminology used by the Federal Trade Commission, ‘The Evolving IP Marketplace, Aligning Patent notice and remedies with Competition’ (2011) available at <http://www.ftc.gov/os/2011/03/110307patentreport.pdf>, accessed 5 December 2013.

develop, design, and produce new products to then ‘holding up’ the product by asking for high licensing fees or suing for patent infringement. The consequence is generally that industrial players have no choice but paying these entities, thus depriving the market from resources that could be used for more useful purposes.¹⁹ This phenomenon is now well known, but is quite hard to fight as these patent trolls have the right to sue if the patents they have acquired have been infringed. Among the tools used to tackle this kind of practice, competition law is prominent, but with mixed results as it will be shown in Section III below.

The coexistence, in patent thickets, of industrial players and patent trolls has led to a huge amount of litigation on the questions of patent infringement and FRAND licensing. In particular, the smartphone industry is hit by a wave of legal proceedings which have negative consequences on the market. This problem will also be presented with more details in Section III below.

2. Interconnection and cooperation: interoperability and the process of standardisation

a) The concept of interoperability

The multiplication of technologies has led to a growing need of interoperability between technologies. When a company is considering the use of several technologies in order to create a new product, it is necessary that these technologies are compatible between each other and with the technologies used in other devices. This compatibility requirement is called interoperability, which can be defined as ‘the ability of two systems to interoperate using the same communication protocol’.²⁰ In the landmark competition case regarding Microsoft, the European Court of Justice (ECJ) held that ‘interoperability is a matter of degree and that various software products in a system ‘interoperate’ (at least partially) when they are able to

¹⁹ Subramanian gives the example of the *Blackberry* case, where RIM was sued by the patent assertion entity New Technologies Products and finally entered in a \$612.5 million settlement. See Sujitha Subramanian, ‘Patent Trolls in Thickets: Who is Fishing Under the Bridge’ (2008) 30 *European Intellectual Property Review* 182.

²⁰ Thomas Hoehn and Alex Lewis, ‘Interoperability Remedies, FRAND Licensing and Innovation: a review of recent case law’ (2013) 34(2) *European Competition Law review* 101.

exchange information and mutually to use the information which has been exchanged'.²¹

Interoperability is particularly important in the telecommunication sector. For example, a phone must use communication technologies and protocols which are compatible with those used in other devices and by network providers. In the same way, a software programmer must create programs which can interoperate with computers and other software. Interoperability creates a network of technologies that can interact between each other. Without interoperability, telephones would not be able to contact each other, Internet websites could not be found from a single computer and computers could only run a limited number of software. Interoperability is thus essential for the development of new technologies and it benefits to the consumer.

However, many competition concerns may arise from interoperability requirements. For example, when Microsoft refused to hand out its computer protocols and patents to competitors, in order to avoid competition from other software designers, the EU Commission and the ECJ ruled that this practice was preventing competitors from creating programs that could interoperate with Microsoft's servers and was contrary to article 102 of the TFEU which prohibits abuse of dominance.²²

b) The process of standardisation

To achieve interoperability between devices and technologies, it is necessary that market players agree on standards that are used in every device. In many technological areas (telecommunication, but also electronics for electrical norms, and so forth), standardisation processes have been set up.

(i) What is a standard?

A standard can be defined as 'a set of technical specifications that seeks to provide a common design for a product or process'.²³ In other words, standards are norms that apply to a category of technology. Standards can be adopted at a worldwide scale, or only at a regional scale. It is usually the

²¹Case T-201/04 *Microsoft v Commission* [2007] ECR II-3601 (Microsoft I), para 158.

²² *ibid.*

²³ Rolf Weber, 'Competition Law Versus FRAND Terms in IT Markets' (2011) 34 *World Competition* 51.

interest of industrial players on the market to create products that comply with standards. Products that use non-standardised technologies are generally commercial failures, because consumers want their devices to interact with those of other people. For example, there would be no point in buying a telephone which could not reach telecommunication networks.

The phenomenon of standardisation is quickly and widely developing because the whole world has become interconnected and the communication devices need interoperability. The markets tend to be global, with producers from different countries using different technologies. It is then necessary that technological devices are compatible between each other's.

Academics²⁴ have identified three ways to achieve standardisation. First, standards can be developed *de facto* 'through market dynamics, as a result of widely spread adoption by purchasers of goods or receivers of services'.²⁵ A good example is BluRay. This technology was created by Sony and eight other companies in order to compete with the HDDVD format created by Toshiba. HDDVD has been a commercial failure and BluRay format has been adopted as the basic storage format and is now used by every video devices, including those of Toshiba. Secondly, standards can be issued by public authorities, which impose the use of certain technical specifications. Third, the most common standards in the new technology markets are cooperative standards, which are set up by private organisations. These organisations are usually specialised in a particular field of technology (telecommunication, electronics and so forth) and their members are undertakings that are active in this field of technology. In order to develop new products and new markets, the members of standard-setting organisations are incited to comply with these standards. For example, communication protocols and technologies such as GSM or 3G are cooperative standards.

(ii) The standard setting-process

The aim of standardisation is to choose a technology which will then be used by all the players in the market to ensure interoperability between their products. Then, in every market which involves interoperability, it can be necessary to adopt standards. Setting up a standard involves the selection of

²⁴ *ibid.*

²⁵ *ibid.*

certain technologies. Usually, several technologies are identified, tested, and compared between each other in order to identify which technology better fits the requirements of the market. Together, the selected technologies form the standard.

This selection is made by the companies active on the relevant market and which accept to participate to the standardisation process. In its 2011 guidelines, the European Commission identified three main groups of companies that may be involved in the standard-setting process:²⁶

- ‘Upstream-only companies that solely develop and market technologies. Their only source of income is licensing revenue and their incentive is to maximise their royalties.’
- ‘Downstream-only companies that solely manufacture products or offer services based on technologies developed by others and do not hold relevant intellectual property rights. For these companies, royalties represent a cost and not a source of revenue, and their incentive is to reduce or avoid royalties.’
- ‘Vertically integrated companies that both develop technology and sell products. These companies have mixed incentives. On the one hand, they can draw licensing revenue from their intellectual property rights. On the other hand, they may have to pay royalties to other companies holding IPR essential to the standard. They might therefore cross-license their own essential IPR in exchange for essential IPR held by other companies.’

Thus, in standard-setting processes, companies often have different and divergent interests. This divergence creates competition problems, for instance when ‘upstream-only’ companies adopt fraudulent behaviours to maximize their royalties.

The negotiations to adopt standards take place within Standard Setting Organisations (SSOs), in charge of managing and monitoring the standardisation process, each in a particular field of technology. These SSOs usually have a framework of rules which ensure cooperation and good faith during the negotiations, in order to avoid fraudulent strategies of their members. Some organisations are international and set up norms which are applied internationally. Nevertheless, most have a regional or national scope

²⁶ 2011 Commission Guidelines (n 1) 267.

of action. In the field of new technologies, some of the most important SSOs are the European Telecommunications Standard Institute (ETSI), the International Internet Engineering Task Force (IETF) or the Institute of Electrical and Electronics Engineers (IEEE).

The technologies that are selected during the standard setting process are covered by patents which belong to private companies. Then, when a patented technology is used within a standard, the patent owner must agree to license its patent to the other members of the organisation. Usually,²⁷ in order to avoid excessive royalties, the patent owner must give access to its technology on fair, reasonable, and non-discriminatory (FRAND)²⁸ terms and conditions. In other words, the patent owner must ask for reasonable fees when licensing its patent. Most of the time, a standard involves many different patented technologies and may therefore be covered by hundreds of patents. To ensure that SSO members know which technologies are patented (and must therefore be licensed) and which ones are freely available before adopting a standard, all the companies involved in the standard setting process must disclose those of their patents that may affect the standard.

This collaborative standard-setting process is essential to ensure interoperability and access to technology, but it can also create competition problems because pooling patents may lead to price fixing practices or limit innovation to increase profitability.²⁹ However, there is now a large consensus about the overall benefits of this kind of process. For instance, the EU Commission recognises that ‘standardisation agreements usually produce significant positive economic effects, for example by promoting economic interpenetration on the internal market and encouraging the development of new and improved products or markets and improved supply conditions. Standards thus normally increase competition and lower output and sales costs, benefiting economies as a whole. Standards may maintain and enhance quality, provide information and ensure

²⁷ For standard-essential patents, see below subsection (iii).

²⁸ In the US, the acronym RAND is used with no reference to fairness.

²⁹ See, in the US, *Allied Tube & Conduit Corp. v Indian Head* [1988] 486, US 492: ‘There is no doubt that the members of such associations often have economic incentives to restrain competition and that product standards set by such associations have a serious potential for anticompetitive harm. [...] An agreement on a product standard is, after all, implicitly an agreement not to manufacture, distribute, or purchase certain types of products.’ In the EU, the Commission also acknowledged the potential anticompetitive effects of standardisation in its 2011 Guidelines, para 263.

interoperability and compatibility (thus increasing value for consumers)'.³⁰ This position is shared by the American authorities in charge of competition policy.³¹

Nowadays, the competition issue at stake is not whether the standard-setting process is good or bad, but it is how to protect this process against the abusive behaviour of undertakings that own standard-essential patents.

(iii) The concept of standard-essential patents.

Some technologies may be more important than others to set up a standard. Most of the standards are based on core technologies, which are essential to the functioning of the standard. These core technologies do not have any equivalent and it is therefore necessary to have access to them in order to make products which are compatible with the standard. When these core technologies are protected by patents, these patents are called standard-essential patents (SEPs). A complete, technical, and accepted definition of standard-essential patents is provided by the IPRs policy of the ETSI, one of the most important SSO in the field of telecommunication:

‘Essential’ as applied to intellectual property rights means that it is not possible on technical (but not commercial) grounds, taking into account normal technical practice and the state of the art generally available at the time of standardisation, to make, sell, lease, otherwise dispose of, repair, use or operate equipment or methods which comply with a standard without infringing that intellectual property right.³²

Owners of these standard-essential patents are obliged to follow stricter rules as regards intellectual property and competition law, to ensure that they properly disclose their patents and license it on FRAND terms and conditions.

³⁰ 2011 Commission’s Guidelines (n 1), para 263.

³¹ The US Department of Justice (DoJ) and the Federal Trade Commission both consider that joint announcement by industry players of their intended maximum licensing terms are not considered anticompetitive. See Elisabetta Rotondo, ‘European Commission Initiates Proceedings Against Samsung for Abuse of Dominance by Failing to License its Standard-Essential Patents on Fair, Reasonable and Non-Discriminatory Terms’ (2012) 33(8) European Competition Law review 347.

³² ETSI Intellectual property rights policy [2012], available at http://www.etsi.org/images/etsi_ipr-policy.pdf, accessed 5 December 2013.

Most of the competition problems occur regarding standard-essential patents, because they give to their owners the power to prevent their competitors from using a technology or to ask for excessive fees, thus giving them an advantage which may go beyond the normal rules of competition. It is however often very difficult to identify which patents are essential for a standard. Undertakings have increased their innovative efforts and tend to apply for patents for each of their inventions, even if these inventions are, in fact, only minor improvements or mere modifications of former technologies.

In this context of patent thicket, identifying those of the inventions which are truly essential may be as looking for 'a needle in a haystack'.³³ The firms themselves may not know which of their patents are essential. Some of them have incredibly large portfolios of patents, and hundreds of patents may relate to a single technology. Therefore, identifying the essential patents may be impossible and antitrust concerns may arise, especially regarding the obligation to disclose essential patents during the standardisation process. As it will be shown in Section III below, patent owners may have an obligation to disclose their standard-essential patents to their competitors.

3. Is the standard-essential patent owner dominant?

The previous paragraphs were dedicated to the description of patents, licensing policies and standardisation. Nevertheless, the central topic of this article is the analysis of this environment under anti-monopoly rules, which is to say under article 102 TFEU and Section 2 of the Sherman Act. Because access to standard-essential patents is necessary to sell high-tech products, standard-essential patent owners may *de facto* block a technological market and limit intra-technology competition if they refuse to disclose or to license their patent on FRAND terms and conditions. To identify whether these conducts may be qualified as abusive or unlawful under TFEU or the Sherman Act, it is necessary to discuss whether standard-essential patent owners may be regarded as dominant on the market. Thus, the question is whether the ownership of a standard-essential patent gives a dominant position or a monopolisation power to the undertaking.

³³ Anne Layne-Farrar, Jorge Padilla, Richard Schmalensee, 'Pricing Patents for Licensing in Standard Setting Organizations: Making Sense of FRAND Commitments' (2007) 74 Antitrust Law Journal 671.

When patents are used in a standard, they become essential to the existence of competition in the markets linked with the standard. The analysis of the EU Commission's 2011 Guidelines³⁴ and Google/Motorola merger decision³⁵ reveal that three different markets linked to standard-essential patents may be identified:

- Technological markets, in which a specific technology represents a market (for instance, the Wifi or USB technologies could be analysed as technological markets),
- Product markets, in which competition exists as regards certain products (smartphones or components like chipsets, for example),
- Standard-essential patent markets, where each standard-essential patent is a separate market.

There is no fixed rule about whether the owner of a standard-essential patent is dominant or not on these markets. In the EU, the Commission adopts a case by case analysis, and refuses to find any presumption of dominance, as stated in its 2011 guidelines:

However, even if the establishment of a standard can create or increase the market power of IPR holders possessing IPR essential to the standard, there is no presumption that holding or exercising IPR essential to a standard equates to the possession or exercise of market power. The question of market power can only be assessed on a case-by-case basis.³⁶

To assess the existence of a market power, the Commission usually bases its analysis on the structure of the market, the nature and the number of competitors as well as the relative importance of the patent compared to others that may be used in the standard.

Following these guidelines, it is possible to state that standard-essential patent owners are dominant on patent markets. The same conclusion can be made as regards technological markets if the technology has been defined through a standardisation process, because once the standard has been defined and uses essential patents, 'the industry becomes "locked-into"

³⁴ 2011 Commission's Guidelines (n 1) 261.

³⁵ *Google/Motorola Mobility* (case COMP/M.6381) Commission decision 2012/1068 [2012] OJ C 75/01

³⁶ 2011 Commission's Guidelines (n 1) 269.

using those patents'.³⁷ Consecutively, standard-essential patents give to their owners a very important market power. Finally, as regards product market, it will depend on whether the technology is often included in high-tech products or not.

Thus, in the patent and technological markets, standard-essential patent owners have a strong market power, because they have the opportunity to block access to markets or to license their patents under unfair terms. Competition problems linked with dominance are then likely to arise on these markets, and mostly in technological markets, which are concerned by the standardisation process.

The second part of this article will analyse competition problems met in the context of standardisation. In this respect, the next section will analyse the main competition concerns related to standard-essential patents and the tools used to prevent them (section III) and the last section will focus on the concept of FRAND (section IV).

III. The difficult application of anti-monopoly rules in the context of standardisation

After having identified the main features of new technology markets, this section focuses on the competition concerns that have been identified in the context of standardisation.

The application of article 101 TFEU and Section 1 Sherman Act has been extensively detailed in guidelines issued by competition authorities, and bright line rules now apply. Therefore, no further details on this issue will be given in this article.³⁸

The question here is not whether standardisation is procompetitive or not (this is another debate), but how dominant undertakings use their market power and threaten this process and what tools can be used in order to tackle abusive practices. The standardisation process can be efficient only if two conditions are correctly fulfilled:

³⁷ Elisabetta Rotondo, 'European Commission Initiates Proceedings Against Samsung for Abuse of Dominance by Failing to License its Standard-Essential Patents on Fair, Reasonable and Non-Discriminatory Terms' (n 31).

³⁸ The 2011 Commission's Guidelines (n 1) contain a lot of information on this issue, and standardisation is now broadly accepted as a positive process for the market.

- First, members of SSOs must agree to disclose their patents before the negotiations take place to choose a standard.
- Secondly, once the standard has been chosen, patent holders must agree to license their patents on FRAND terms.

These two conditions are essential for the standard setting process to work properly. This section will therefore focus on the practices that are contrary to these conditions and identify whether they have been qualified as abusive under competition law and what remedies have been used.

1. The obligation to disclose standard-essential patents

a) Patent ambush: a major concern for SSOs

During the standardisation process, undertakings agree to choose technologies that will be integrated to a standard and to dismiss every other alternative technologies, in order to ensure interoperability between their products. Thus, when a standard is chosen and the manufacturing process has started, it is not possible to switch to another technology. As Culley, Dhanani and Dolmans wrote:

Selecting a particular technology means committing to that choice for that standard and abandoning research tracks involving alternative technologies that may have been good substitutes *ex ante*, i.e., before the standard was set. Once an industry has committed itself to go down the agreed road, and investments have been sunk into implementation of the standard (*ex post*), firms become locked in.³⁹

Thus, the *ex ante* disclosure requirement is very important when discussing a standard, especially as regards standard-essential patents. SSOs' members must disclose their standard-essential patents to allow upstream negotiations and avoid patent infringement once the standard is chosen. This obligation can be considered as an expression of an obligation of good faith.

Once standard-essential patents have been disclosed, SSOs' members can start their negotiations with a full knowledge of the state of the art, the position of each manufacturer and the eventual licensing requirements. Indeed, patents are published as soon as they are granted, but given the

³⁹ Daniel Culley, Malik Dhanani and Maurits Dolmans, 'Learning From Rambus: How to Tame Those Troublesome Trolls' (2013) 57(1) The Antitrust Bulletin 117.

proliferation of patents in new technology markets, general patent disclosures are too numerous to provide effective notice. Moreover, patent protection starts from the filing date of the patent. Thus, a standard essential patent may be pending and remain secret until they are granted.⁴⁰

This is why SSOs are very concerned by patent disclosures and have included disclosure obligations in their IP policies, to force SSO members to disclose their patents to the other members as soon as a technology is discussed. For instance, ETSI, which is the major European standard organisation in the sector of telecommunication, has issued IPR Policies which contains this obligation in its article 4:

[E]ach Member shall use its reasonable endeavours, in particular during the development of a Standard or Technical Specification where it participates, to inform ETSI of Essential IPRs in a timely fashion. In particular, a MEMBER submitting a technical proposal for a Standard or Technical Specification shall, on a bona fide basis, draw the attention of ETSI to any of that Member's IPR which might be Essential if that proposal is adopted.⁴¹

The aim of these policies is to avoid what is called 'patent ambush', or 'patent hold-up'. A patent ambush occurs when a SSO's member fails to disclose its relevant standard essential patents during the standard-setting process. The SSO members then agree on a standard which incorporates the hidden patented technology. Thus, the ambusher is in a position in which it can trap the other members of the industry which are locked into the standard they have adopted. Usually, the standard essential patent holder sues its competitors over patent infringement in order to increase the level of its licensing fees.

Patent ambush is an important concern for SSOs, which have identified this practice as particularly dangerous for the success of the standardisation process. It would be a disincentive to the participation of standard-setting activities if members of the SSOs would have the ability to hide their relevant essential patents until a standard is agreed. This is why SSOs have anticipated the problem of patent ambush and took steps to prevent it through their IPR policies. But despite these binding policies, patent hold

⁴⁰ *ibid.*

⁴¹ ETSI Intellectual Property Rights Policy (n 31).

ups are still likely to happen. Moreover, it must be pointed out that the participation to standard-setting processes is not mandatory. Non-members are not bound by SSOs' IPR policies and may find in patent hold up a good leverage to obtain money using their patent portfolios. Usually, these companies are not involved in research and development or manufacturing activities, but are in patent trolls.⁴² In these circumstances, competition authorities have used competition law in order to tackle patent ambush practices.

b) The difficult application of competition rules to patent ambush

Patent ambush practices have been investigated by competition authorities in the EU under article 102 TFEU, which prohibits abuse of dominance, and in the US under Section 2 of the Sherman Act, which prohibits monopolisation. Essential patent owners have a dominant position on the technological and patent markets. Thus, these provisions naturally tend to apply. The question is whether patent ambush may be considered as abusive and to what extent competition law can apply to it.

(i) Application of EU Competition law

In the EU, article 102 of the TFEU prohibits 'any abuse by one or more undertakings of a dominant position' which may consist in 'directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions' or 'limiting production, markets or technical development to the prejudice of consumers'. Thus, standard-essential patent holders may be in breach of competition principles if, using their patents, they act in a way that contravenes article 102.

The EU Commission has already analysed patent ambush under competition rules. In 2007, it sent statement of objections to the American technology licensing company Rambus for an alleged infringement of article 102 TFEU. Rambus was accused of not disclosing its patents and patent applications during the standard setting process for DRAM chips⁴³ technology and later claiming that its patents were relevant to the adopted standard, thus asking for excessive royalties.⁴⁴

⁴² See Section II.1(c) above.

⁴³ Dynamic Random Access Memory.

⁴⁴ *Rambus* (case COMP/38.636) Commission Decision [2009].

However, the abusive conduct was not the patent ambush practice itself, but the fact that, according to the EU Commission, Rambus claimed fees for the use of its essential patents at a level which it would not have been able to charge if it properly disclosed its patents during the standard-setting process. The EU Commission considered that the fact that Rambus did not act in good faith and did not respect the patent policy of the standard organisation (JEDEC) was not in itself a violation of article 102 TFUE. The competition concern lies in the fact that, for the Commission, ‘the conduct (...) has necessarily influenced the standard process, in a context where suppression of the relevant information necessarily distorted the decision making process within a standard-setting body’.⁴⁵

The Commission held that Rambus captured the DRAM technology and took advantage of this lock-in situation to ask for unreasonable licensing fees, where the intention of the members of the SSO was to design a patent-free standard around the Rambus’ patents.⁴⁶ It also noted that some alternative technologies might have been chosen if Rambus had disclosed its patents on time.⁴⁷ Nevertheless, the Commission did not rule on the application of competition principles to patent ambush practices. In its decision, it did not assess whether the fees received by Rambus to license its technology were unreasonable or not. Similarly, even if the Commission argues that alternative technologies could have been chosen, it does not seek whether another technology would have effectively been chosen in the case where Rambus had disclosed its patents.⁴⁸

Thus, the finding of an abusive conduct lied mostly on two factors: the hypothetical behaviour of the members of the SSO, based on the assumption that their strategy was to limit their costs, and the availability of alternative technologies.⁴⁹ However, the Commission does not analyse whether Rambus’ conduct had effectively limited the production or the technical development of the DRAM technology and asked for fees which were unreasonably high. This may explain why the Commission finally chose to

⁴⁵ *ibid*, 39.

⁴⁶ *ibid*, 43.

⁴⁷ *ibid*, 46.

⁴⁸ *ibid*.

⁴⁹ *ibid*, 44, 46.

settle the case after Rambus committed out to adopt a worldwide cap on its fees for products compliant with the standard.

In the light of the commitment decision, it is unclear whether patent ambush constitutes an abuse of dominance. It could certainly be considered unlawful under article 102 TFEU if the Commission could prove that the licensing fees charged by the ambusher were unreasonable or if the members of the SSO would have chosen another alternative technology. To effectively tackle patent ambush under article 102 TFEU, the Commission could also have adopted a more flexible and dynamic interpretation of this article and consider that patent ambush was in itself abusive, as recommended by Culley, Dhanani and Dolmans:

To avoid this difficulty, the Commission could have defined a *sui generis* form of abuse, in addition to or instead of relying on the ban on excessive pricing, recognizing that the abuse in question was the last link of a chain of events, beginning with Rambus's participation in JEDEC, its decision to leave JEDEC, its letter to JEDEC creating the misleading impression that Rambus had and would have no patent reading on the technology that JEDEC considered for the standard, and the adjustment of its patent claims based on the information received from Secret Squirrel—all of which occurred before the industry was locked in and before Rambus became dominant as a result— and continuing with Rambus's decision to demand royalties for its patents once the industry was locked in.⁵⁰

However, this is forgetting that the Commission has adopted an effect based analysis of unilateral behaviors under article 102 TFEU and is not keen on recognizing 'per se' abuses⁵¹ (even if in some circumstances the EU Courts have adopted a more balanced position, for example regarding predatory pricing practices). Moreover, this kind of practice is not listed in article 102. Finally, this seems to be a contractual problem, more than a competition problem. The application of competition law requires that competition be threatened, at the expense of the consumer. It is therefore necessary to demonstrate anticompetitive effects, which the Commission struggles to achieve.

⁵⁰ Culley, Dhanani and Dolmans, 'Learning From Rambus' (n 39).

⁵¹ Communication from the Commission - Guidance on the Commission's priority in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings [2009] OJ C 45/02.

However, the recent policy of the Commission shows that it intends to keep fighting patent ambush under article 102 of the TFEU. In 16th of December 2012, the EU Commission announced that it opened formal proceedings against Honeywell for patent ambush practices. The investigations focus on failure to disclose essential patents to the Society of Automotive Engineers during the standard selection process of a refrigerant called 1234yf, used in future air conditioning systems.⁵²

(ii) Application of US Competition law

In the US, competition authorities also showed concerns about patent ambush and the effects of these practice on competition. Like in Europe, the FTC investigated on Rambus' behavior regarding DRAM essential patents. In its decision of the 2nd of February 2007, the FTC found that Rambus violated Section 2 of the Sherman Act by manipulating the JEDEC standard-setting process and thus gaining monopoly power,⁵³ which is the criterion for antitrust liability under Section 2.⁵⁴ In its decision, the FTC took the hypothetical view that if Rambus had properly disclosed its essential patents to JEDEC, the outcome for the standardisation process 'would have been more competitive',⁵⁵ because JEDEC would have been able to negotiate licensing terms ex ante or would have chosen technologies alternative to Rambus's essential patents.

Nevertheless, the judicial authority has set up some limits to the application of antitrust principles to this practice. After Rambus challenged the FTC's decision, the DC Circuit considered that the FTC had not brought enough evidence about the situation that would have been without Rambus' deception. The Court held that 'if JEDEC, in the world that would have existed but for Rambus' deception, would have standardized the very same technologies, Rambus's alleged deception cannot be said to have had an

⁵²EU Commission press release number IP/11/1560. http://europa.eu/rapid/press-release_IP-11-1560_en.htm accessed 5 December 2013.

⁵³*In the Matter of Rambus Inc*, Opinion of the FTC [2006], FTC file 9302.

⁵⁴ Section 2 of the Sherman Act provides: 'Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$100,000,000 if a corporation, or, if any other person, \$1,000,000, or by imprisonment not exceeding 10 years, or by both said punishments, in the discretion of the court.'

⁵⁵ See *In the Matter of Rambus Inc* (n 52).

effect on competition in violation of the antitrust laws'.⁵⁶ Thus, as the doctrine noted, 'the general rule that emerges from Rambus is that a patent-holder's deceptive conduct before an SSO will not give rise to liability under Section 2 if such conduct cannot be shown to have caused the SSO to include that technology in its standard over an alternative'.⁵⁷

Needless to say that such causation is difficult, if not impossible, to prove. This case as well as the settlement reached by the EU Commission has evidenced the difficulty to apply competition principles to patent ambush. Patent ambush can be considered as a competition problem (it certainly has anticompetitive effects) with no competition law solution. The study of US case law on this matter shows that other tools can be used to tackle patent ambush.

In the private patent dispute opposing the high tech firms Qualcomm and Broadcom, a solution was found on the basis of contract law.⁵⁸ Like Rambus, Qualcomm failed to disclose its essential patents to the SSO JVT and aimed at asking for licensing fees once the standard was adopted. Broadcom which was a member of the same organisation alleged that Qualcomm voluntarily failed to disclose its SEPs and thus violated its commitment to the SSO, which had included a disclosure obligation in its IPR policy. The District Court, as well as the Federal Circuit concluded that Qualcomm's practice was contrary to its commitments to the SSO members and that Broadcom brought enough evidence that, even if the SSO's policy was ambiguous, there was an implied obligation to disclose. Consecutively, the Court made Qualcomm's essential-patents unenforceable against other market players.

This case shows that this approach, based on the contract between SSO members, is much simpler than the one based on competition law, which is blocked by a problem of evidence. The Court did not require that Broadcom proves the impact of Qualcomm's behavior on the outcome of the standardisation process. Thus, as Royal, Tessar and di Vincenzo highlighted, 'the FTC sought but failed to obtain a remedy in Rambus to protect all market participants affected by the challenged conduct. Broadcom, in

⁵⁶ *Rambus Inc v FTC* (2008) 522 3d FC 456, Certiorari denied, 129 S Ct 1318 (2009).

⁵⁷ Jonathan Hillel, 'Standards x Patents + Antitrust = co: the Inadequacy of Antitrust to Address Patent Ambush' (2010) 17 *Duke Law & Technology Review* [i].

⁵⁸ *Qualcomm Inc v Broadcom Corp* (2008) 548 3d FC 1004.

contrast, achieved industry-wide relief using a traditional common law defence'.⁵⁹

A similar approach based on contract law could be followed in the EU, with the advantage that no anticompetitive effect has to be proven. However, there are no EU rules on contracts and the EU Commission and the ECJ have no jurisdiction over contract law issues. Breach of a contract may be invoked by victims of patent hold-ups in front of European national courts, but there may be a risk of inconsistent outcomes, which would add to the confusion.

2. The obligation to license standard-essential patents

The other main competition concern regarding standardisation is the licensing of standard-essential patents. Two issues are at stake: licensing is an issue in itself, because some players may refuse to license and thus block access to market. Licensing terms and conditions is another issue, because licensing fees must remain at a reasonable level to ensure competition on markets. Moreover, SEPs holders should not have the possibility to use their position to ask for undue advantages.

This is why SSOs and competition authorities have designed tools to force patent holders to license their essential patents on FRAND terms.

a) An extensive control by SSOs, courts and competition authorities

SSOs and competition authority closely monitor the respect of their licensing obligations by standard-essential patent holders. All SSOs have included in their IPR policies obligations to license on FRAND terms. For instance, Article 6 of ETSI's IPR policy provides:

When an Essential IPR relating to a particular Standard or Technical Specification is brought to the attention of ETSI, the Director-General of ETSI shall immediately request the owner to give within three months an irrevocable undertaking in writing that it is prepared to grant irrevocable licences on fair, reasonable and non-discriminatory

⁵⁹ Sean Royall, Amanda Tessar, Adam di Vincenzo, 'Deterring "Patent Ambush" in Standard Setting: Lessons From Rambus and Qualcomm' (2008-2009) 23 Antitrust 34.

(‘FRAND’) terms and conditions under such IPR to at least the following extent: [manufacture, sell, lease, dispose, repair or use].⁶⁰

As shown above concerning patent ambush,⁶¹ such clause may be invoked in courts proceedings in order to obtain adequate relief in the case where an essential patent holder would refuse to license its IP rights. In this respect, Geradin and Rato noted that:

The enforceability of the FRAND obligation results from the fact that it forms part of a private agreement between an IPR owner and an SSO--it is contractual in nature. As we have noted elsewhere, in such circumstances the standard implementer may simply wait and assert defensively that the IP owner has failed to satisfy its obligation to offer FRAND terms, or (under the procedure appropriate in a given jurisdiction) proactively seek a determination through a breach of contract action that FRAND terms have not been offered, and an order requiring compliance with that obligation. If the essential IP owner has in fact failed to offer FRAND terms consistent with its FRAND obligation, then this will represent a breach of contract.⁶²

The competition authorities also accept the fundamental role of court proceedings based on contractual commitments to license. For example, the EU Commission, in its decision on the Google/Motorola merger, noted that:

[A] FRAND commitment cannot be considered as a guarantee that a SEP holder will not abuse its market power. Although a FRAND commitment may influence a company's incentives to significantly impede effective competition, it remains true that the company would still have some ability to do so. However, that ability would ultimately be constrained to an extent by the fact that FRAND is an obligation upon which inter alia courts, arbitral tribunals, or competition authorities may rule.⁶³

Thus, in the context of standardisation, contract law and litigation based on breaches of commitments to license are recognised as the dedicated tools to

⁶⁰ETSI Intellectual Property Rights policy (n 32).

⁶¹See above Section III 1(b)(ii).

⁶² Damien Geradin and Miguel Rato, ‘FRAND Commitments and EC Competition Law: A Reply to Philippe Chappatte’ (2010) 6(1) European Competition Journal 129.

⁶³*Google/Motorola Mobility* (n 31) 113. In the US, see *In re Robert Bosch GmbH* [2012] FTC File 121-0081.

fight refusal to license practices from SEP holders. Nevertheless, this kind of clause is only binding for SSO members, and some standard-essential patent owners, such as patent trolls, may not be part of standard organisations. This is also the case in a situation where a company obtains a patent closely related to a standard after the standard is adopted. In these situations, competition principles may apply and provide an efficient solution.

(i) Application of competition law to refusal to license in the EU

As regards EU competition law, the ECJ agreed that data or IP rights that are necessary to compete on a secondary market, that is to say a market which is dependent and interoperable with a primary market (spare parts for cars for example), should be licensed under reasonable terms.

In the landmark case *Volvo*, which concerned protected designs for cars, the ECJ held that:

The exercise of an exclusive right by the proprietor of a registered design in respect of car body panels may be prohibited by Article 82 EC if it involves, on the part of an undertaking holding a dominant position, certain abusive conduct such as the arbitrary refusal to supply spare parts to independent repairers, the fixing of prices for spare parts at an unfair level or a decision no longer to produce spare parts for a particular model even though many cars of that model are still in circulation, provided that such conduct is liable to affect trade between Member States.⁶⁴

However, the ECJ also recognised that a refusal to license its IPRs is not in itself abusive and that an IPR holder which would be forced to license its rights would be ‘deprived of the substance of his exclusive right’.⁶⁵ It is only in ‘exceptional circumstances’ that ‘the exercise of an exclusive right may involve an abuse’.⁶⁶

The ECJ provided details about the kind of exceptional circumstances which could lead to an abuse. It is only if these circumstances exist that the right holder may be forced, under article 102 TFEU, to license its rights to

⁶⁴Case 238/87 *Volvo v Commission* [1988] ECR 6211, para 9.

⁶⁵ *ibid*, 8.

⁶⁶Joined cases C-241/91 P and C-242/91 P *RTE and ITP v Commission* [1995] ECR I-743 (Magill), para 50.

competitors. These circumstances were set up in the *Magill* case⁶⁷ and used in the *Microsoft* case.⁶⁸

- in the first place, the refusal to license ‘relates to a product or service indispensable to the exercise of a particular activity on a neighbouring market’;
- in the second place, the refusal to license ‘is of such a kind as to exclude any effective competition on that neighbouring market’;
- in the third place, the refusal to license ‘prevents the appearance of a new⁶⁹ product for which there is potential consumer demand’;
- In the fourth place, the refusal to license is not ‘objectively justified’.⁷⁰

These circumstances could apply to standard-essential patent owners which refuse to license their patent, thus blocking the use of a standardised technology. In this context, access to the standard essential patent is indispensable to use a standardised technology and it excludes effective competition because manufacturers would not use this technology in order to avoid patent infringement. As a consequence, devices which would use the technology using the patented invention would not be marketed, and any justification is unlikely to be found.

Besides this obligation to supply is the respect of FRAND licensing terms, which is also monitored by competition authorities. For example, in the field of merger control, the EU Commission considers that the respect of FRAND commitments is a prerequisite to the clearance of a merger involving SEP holders. FRAND terms will be at the heart of section IV of this article.

(ii) Legal framework of refusal to license in the US

In the US, the legal framework regarding refusal to license is a bit different because the Sherman Act does not prohibit exploitative practices and the burden of proof is heavier for competition authorities or plaintiffs. The Supreme Court considered that no obligation to deal could be imposed on the ground of Section 2 of the Sherman Act as long as no anticompetitive conduct is detected. Absent any anticompetitive behaviour, dominant firms have the right to charge under the terms and conditions they choose.

⁶⁷ *ibid.*

⁶⁸ *Microsoft I* (n 21).

⁶⁹ The term ‘new’ also encompasses improvements.

⁷⁰ *Microsoft I* (n 21), paras 332-333.

In *Trinko*, which is the landmark case on this matter, the Supreme Court heard a complaint based on the refusal of Verizon to give access to its essential telecommunication network to its competitors. Justice Scalia explained that:

The mere possession of monopoly power, and the concomitant charging of monopoly prices, is not only not unlawful; it is an important element in 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. To safeguard the incentive to innovate, the possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive conduct.⁷¹

In *Pacific Bell*, Chief Justice Roberts considered, in the same reasoning than in *Trinko*, that '[A] firm with no duty to deal in the wholesale market has no obligation to deal under terms and conditions favourable to its competitors'.⁷² Thus, a refusal to license can be prohibited on the ground of Section 2 if an anticompetitive behaviour is proven, that is to say if 'an actual or threatened monopoly is being created in the second market'.⁷³ Applied to the standardisation context, it is not clear whether a standard-essential patent holder that would refuse to license would create a monopoly on the secondary market. This would be true for a vertically integrated firm, which would try to enjoy a monopolistic position on the market as regards manufactured products (smartphones or components like chipsets for instance).

The answer is not clear as regards patent trolls, which do not want to be dominant on a secondary market but just aim at extorting money from other companies. In the US, then, refusal to license is much more difficult to tackle based on antitrust principles than in the EU because the burden of proof is much heavier. However, in this jurisdiction as well as in the EU, the fundamental question of abusive injunctions has been analysed under competition law.

⁷¹*Verizon Communs, Inc v Law Offices of Curtis v Trinko*, 540 US 398 (2004) (*Trinko*).

⁷²*Pacific Bell Telephone Co v LinkLine Communications*, No 07-512 (*Pacific Bell*).

⁷³ Donald I Baker, 'An Enduring Antitrust Divide Across the Atlantic over Whether to Incarcerate Conspirators and When to Restrain Abusive Monopolists' (2009) 5(1) *European Competition Journal* 145.

b) The Smartphone war and its legal consequences

The smartphone market is characterised by a vast patent thicket. In the last five years, Companies such as Ericsson, Apple, Microsoft, HTC, Samsung, Motorola, LG or Nokia have sued each other for patent infringements or unreasonable licensing fees in several jurisdictions all around the world.⁷⁴ The figure in Annex 1 offers a striking representation of the intensity of this patent war, in which all the players on the market are involved. Moreover, patent trolls bring dozens of infringement actions in front of US Courts in connection with standard-essential patents. For instance, in 2013 these entities brought several actions regarding patents covering features of the Wi-Fi technology.⁷⁵

This ‘smartphone war’ highlights the danger of patent thickets. In the last two years, the total patent litigation expenses related to smartphones have been estimated at 20 billions of dollars⁷⁶ and several major firms, such as Apple or Google, have spent more money on litigation and patent acquisitions than on research and development activities.⁷⁷ Another consequence is that small high-tech firms which focused on innovation did not resist the financial pressure of these multiple lawsuits and had to stop their activities.⁷⁸

Some companies have lodged complaints in front of competition authorities in the US as well as in the EU on the ground that some of these lawsuits may be abusive and aimed at weakening competitors. For instance, Apple and Microsoft complained to the EU Commission about the injunctions

⁷⁴Mostly in the US, Korea, Japan, Germany, United Kingdom and several other European jurisdictions.

⁷⁵ Matt Rizzolo, ‘Non-Practicing Entity Wyncomm LLC Claims WiFi Devices Infringe Former AT&T Patent’ (Essential Patent Blog, 11 April 2013) <<http://essentialpatentblog.com/2013/04/non-practicing-entity-wyncomm-llc-claims-wifi-devices-infringe-former-att-patent/>> accessed 5 December 2013; Matt Rizzolo, ‘Intellectual Ventures Sues Motorola Mobility Over Patents Relating to WiFi, Cellular Standards (and Others)’ (Essential Patent Blog, 19 June 2013) <<http://essentialpatentblog.com/2013/06/intellectual-ventures-sues-motorola-mobility/>> accessed 5 December 2013.

⁷⁶According to a study of Stanford University. See Charles Duhigg, Steve Lohr, ‘The Patent, Used as a Sword’, *The New York Times* (New York, 7 October 2012) <<http://www.nytimes.com/2012/10/08/technology/patent-wars-among-tech-giants-can-stifle-competition.html?pagewanted=all&r=0>> accessed 5 December 2013

⁷⁷ *ibid.*

⁷⁸ *ibid.*

sought by Motorola in several European jurisdictions⁷⁹. Thus, competition authorities went into applying competition rules against abusive injunctions.

In the US, the FTC has already taken a decision on this issue and obtained from Google to stop seeking injunctions against its competitors. The FTC condemned the practice of abusive injunctions not on the ground of Section 2 of the Sherman Act, but on the Ground of Section 5 of the Federal Trade Commission Act (15 USC §45) which prohibits ‘unfair or deceptive acts of practices in or affecting commerce’. This difference may show that the FTC accepted that Section 2 was not an efficient legal basis to prohibit practices linked to the supply of SEPs.

In its Statement, the FTC summarized the effects of abusive injunctions on the standard-setting process:

The threat of an injunction allows a SEP holder to demand and realize royalty payments reflecting the investments firms make to develop and implement the standard, rather than the economic value of the technology itself. In addition to harming incentives for the development of standard-compliant products, the threat of an injunction can also lead to excessive royalties that may be passed along to consumers in the form of higher prices. Alternatively, an injunction or exclusion order could ban the sale of important consumer products entirely.⁸⁰

In the EU, the Commission expressed the same concerns as regards injunctions sought by standard essential patent holders against their competitors. For example, in the recent merger of Google and Motorola, the Commission emphasised the effects of injunctions on competition and for consumers:

Depending on the circumstances, it may be 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

⁷⁹ Commission, ‘Antitrust: Commission opens proceedings against Motorola’ (Press Release, 3 April 2012) IP/12/345, available at http://europa.eu/rapid/press-release_IP-12-345_en.htm accessed 5 December 2013

⁸⁰In the Matter of Google Inc., Statement of the FTC [2013] FTC file 121-0120.

onerous licensing terms which it would otherwise not have agreed to. These onerous terms may include, for example, a higher royalty than would otherwise have been agreed. Another concern would be that the SEP holder may force a holder of non-SEPs to cross-license those non-SEPs to it in return for a licence of the SEPs. To the extent that injunctions are actually enforced, this furthermore may have a direct negative effect on consumers if products are excluded from the market. Even if exclusion of competing products from the market through injunctions were to be temporary (i.e. there would be a delay only in access to the relevant products until the counter-party of the SEP holder agreed to the commercial terms demanded), in a fast-moving market such as the smart mobile device market, serious harm could potentially be caused by it.⁸¹

Recently, the EU Commission went further by starting investigations and sending statements of objections to companies which allegedly sought abusive injunctions in several European jurisdictions to prevent their competitors from using SEPs. On the 21st of December 2012, it sent a statement of objections to Samsung for seeking injunctive relief for the use of its SEPs related to the 3G UMTS standard.⁸² On the 6th of May 2013, the Commission sent a statement of objection to Motorola⁸³ for similar practices.

This recent interest of competition authorities for abusive injunctions and the apparent unanimity on their negative effects on competition and prices must not hide the fact that a strict and burdensome legal framework has been built by the courts on this issue.

In the *Promedia* case, the General Court of the EU held that prohibiting injunctions was ‘an exception to the general principle of access to the courts, which ensures the rule of law’.⁸⁴ Thus, it applied two cumulative

⁸¹ *Google/Motorola Mobility* (n 35) 107.

⁸² Commission, ‘Antitrust: Commission sends statement of Objections to Samsung on potential misuse of mobile phone standard-essential patents’ (Press release, 21 December 2012) IP/12/1448, available at http://europa.eu/rapid/press-release_IP-12-1448_en.htm accessed 5 December 2013.

⁸³ Commission, ‘Antitrust: Commission sends statement of Objections to Motorola Mobility on potential misuse of mobile phone standard-essential patents’ (Press release, 6 May 2013) IP/13/406, available at http://europa.eu/rapid/press-release_IP-13-406_en.htm accessed 5 December 2013.

⁸⁴ Case T-111/96 *ITT Promedia NV v Commission* [1998] ECR II-2937, para 61.

criteria to find whether a legal proceeding can be deemed abusive on the ground of article 102 TFEU. To be abusive, a court action by a right holder:

- 'cannot reasonably be considered as an attempt to establish its rights and can therefore only serve to harass the opposite party', and must be
- 'conceived in the framework of a plan whose goal is to eliminate competition'.⁸⁵

Even if the Court refused to rule on the correctness of these criteria, which were originally set up by the Commission, the Court applied it as if it had accepted it and these criteria should be accepted as the law.

These two criteria are very strict, and must be construed narrowly.⁸⁶ It is quite difficult for the Commission to prove that SEP holders don't want to establish their rights and aim at eliminating competition. However, in the context of standard setting, the fact that SEPs have to comply with FRAND commitments and refuse to do so may help to demonstrate a deliberate attempt to eliminate competition.

Where a commitment to an SSO has been made, the EU Commission may create a presumption of fraud and decide to prohibit injunctions *per se* under competition rules. In this case, the plaintiff would have to prove that it actually attempts to establish its rights and that it licenses its SEPs on FRAND terms. This approach would be close to the one followed by the FTC, and would be less burdensome for the staff of the Commission. However, the compliance of such a presumption with the criteria of the ECJ remains doubtful.

Hopefully, the results of the investigations of the Commission on the injunctions sought by Motorola and Samsung should bring more details on the extent to which competition rules can apply to abusive injunctions. It may also bring more information on the concept of FRAND and when a licensing term is compliant with FRAND or not. It seems that establishing a better definition of FRAND is necessary to find whether a patent holder acts abusively when seeking an injunction. That will be discussed in the next section of this article.

⁸⁵Ibid, 30.

⁸⁶Ibid, 61.

IV. Defining FRAND to efficiently apply competition rules to standard-essential patents

SSOs focus on technical matters linked to the standard-process. However, they are usually not mandated to take part in commercial negotiations regarding cross-licences and licensing fees. The only rule is that standard-essential patent holders must license their patents on fair, reasonable, and non-discriminatory (FRAND) terms and conditions. Therefore, it is the SSOs' members which negotiate the contractual licensing terms, without any external intervention. Consequently, it is hard to find whether the negotiated terms are effectively FRAND.

This section focuses on the notion of FRAND and explains why the absence of definition limits antitrust intervention regarding SEP licensing obligations. Some attempts to define FRAND will also be presented, but the question of how to calculate FRAND is too complex and too large to be fully treated here. This issue could be in itself the topic of a separate article.

1. An undefined concept

In a large number of occasions, competition authorities and courts explained that one of the main antitrust concerns regarding standard-essential patents was the respect of FRAND commitments. Consecutively, there is an extensive antitrust activity as regards FRAND commitments, to control the behaviour of SEP holders and make sure that they do not hold up the standardisation process or threaten their competitors by filing abusive court actions.⁸⁷ Nevertheless, another issue is whether competition authorities have the ability to control directly the compliance of licensing terms negotiated between SSOs members with FRAND requirements.

FRAND terms are negotiated between the licensor and the licensee and are therefore contractual terms that correspond to the will of the parties and bind them. Competition authorities have the power to prohibit contracts that are contrary to antitrust principles (for example exclusivity contracts or discriminatory contracts). Therefore, the intervention of competition authorities should be possible to establish whether the negotiated terms are FRAND compliant or not. For instance, in the EU, the Commission could intervene on the ground of excessive pricing. However, until now there is no

⁸⁷ See above Section III.2(b).

example of direct intervention of the competition authorities on this matter.⁸⁸

Competition authorities should be able to assess whether licensing terms are FRAND or not. In other words, a legal definition of FRAND should be given, to create legal certainty and allow an efficient control on licensing terms. This would also be useful, for instance, in the context of patent ambush to prove that ambushers sought unreasonable fees. As explained above, the mere fact of hiding the existence of a patent during the standard setting process is not in itself abusive. What is abusive is to adopt a lock-in strategy to then license standard-essential patents on unreasonable terms. In this context, giving a legal definition of FRAND terms may be useful.

However, until now, competition authorities or courts have given no definition of FRAND. In several occasions, the EU Commission investigated on companies which refused to license on FRAND terms and conditions. For instance, in 2007, the EU commission investigated on whether the American chipset manufacturer Qualcomm failed to license its SEPs on FRAND terms after its patents became essential to the WCDMA standard, used in mobile telecommunication.⁸⁹ However, the Commission stopped its investigations after the complainants withdrew their claims.

The most famous case regarding FRAND terms is certainly the *Microsoft* case. The EU Commission fined Microsoft for refusal to disclose and license on FRAND terms its technical specifications and patents that were necessary to interoperate with some of the network functions ('work group server operating systems') of its products. On appeal of the Commission's decision, the General Court of the EU held that in order to ensure interoperability with Microsoft's products, the Commission was right to oblige Microsoft to license its IPRs on FRAND terms, thus giving a confirmation that FRAND was a competition requirement under article 102 TFEU.⁹⁰ Then, after Microsoft accepted to license its specifications and patents, the Commission considered that Microsoft did not comply with the

⁸⁸ In a press release, the Commission also announced its intention to examine whether Motorola "offered unfair licensing conditions" for its standard essential patents. See Commission, 'Antitrust: Commission opens proceedings against Motorola' (n 78).

⁸⁹ Commission 'Antitrust: Commission initiates formal proceedings against Qualcomm' (Press release, 1 October 2007) MEMO/07/389, available at http://europa.eu/rapid/press-release_MEMO-07-389_en.htm?locale=en, accessed 5 December 2013.

⁹⁰ *Microsoft I* (n 20), paras 808- 809.

FRAND requirement and ordered Microsoft to modify its licensing policy to comply with FRAND. However, neither the Commission nor the Court gave a more detailed explanation of what constitutes FRAND terms.⁹¹

The only indication given by the General Court in *Microsoft* is that FRAND terms are not necessarily the same for all patents or for all companies, even for the same technology. But does it mean that no definition of FRAND should be given? In any case, the broad terms used to describe this kind of commitment (no one can exactly state what ‘fair and reasonable’ mean) and the relative silence of competition authorities have led to uncertainty about the conditions under which essential patent holders should license their essential IP rights to be fully compliant with competition law.

2. Defining FRAND to create legal certainty

Even if there is no accepted competition law definition of FRAND terms, competition authorities and courts gave some guidelines in order to assess the compliance of licensing terms with FRAND requirements. Legal and economic doctrine also presented several theories in this respect, but it is uncertain whether these theories would be accepted in a competition law analysis.

a) Guidelines from competition authorities and courts

The EU Commission in particular gave its vision of FRAND without formally giving a binding legal definition. Its 2011 guidelines contain several examples of how FRAND terms should be determined:

In case of a dispute, the assessment of whether fees charged for access to IPR in the standard-setting context are unfair or unreasonable should be based on whether the fees bear a reasonable relationship to the economic value of the IPR. In general, there are various methods available to make this assessment. In principle, 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

⁹¹Case T-167/08 *Microsoft v Commission* (27 June 2012) (*Microsoft II*). In this case, the Court dismissed the argument of Microsoft according to which the Commission failed to define what a reasonable rate was. The Court considered that, in this case, there was ‘no need for that purpose for reasoning dealing specifically with the possibility of the Commission imposing a periodic penalty payment without first specifying a reasonable rate’, para 100.

patent or groups of patents. Instead, it may be possible 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). This assumes that the comparison can be made in a consistent and reliable manner.

Another method could be to obtain an independent expert assessment of the objective centrality and essentiality to the standard at issue of the relevant IPR portfolio. In an appropriate case, it may also be possible to refer to ex ante disclosures of licensing terms in the context of a specific standard-setting process. This also assumes that the comparison can be made in a consistent and reliable manner. The royalty rates charged for the same IPR in other comparable standards may also provide an indication for FRAND royalty rates. These guidelines do not seek to provide an exhaustive list of appropriate methods to assess whether the royalty fees are excessive.⁹²

In the US, a court gave a list of criteria have been used as a basis to determine FRAND terms. In the *Georgia-Pacific* case, the Southern District of New-York listed fifteen criteria that should be taken into account to when calculating what is fair and reasonable for determining damages.⁹³ This non-exhaustive list is quite complete but the criteria are still hard to construe. However, this is the only case where a court gave its opinion in the topic. These fifteen factors are as follows:

- The level of the royalties paid by the licensee;
- The level of royalties paid by the licensee for other comparable patents;
- The scope and the nature of the licence, whether it is exclusive or not and whether there geographic restrictions or not;
- The licensor's policy as whether it seeks to maintain its monopoly of the technology or it licenses to other licensees;
- The relationship between the licensor and the licensee, especially whether they are competitors or not;
- The impact of the patented technology on the licensee's commercial activity, including whether the patented technology has an impact on the sales of other non-patented products;

⁹²2011 Commission's Guidelines (n 1) 289-290.

⁹³*Georgia Pacific Corp v US Plywood Corp* [1970] 318 F Supp 1116, SDNY.

- The duration of the patent;
- The foreseen profitability and popularity of the products using the patent;
- The advantages of the patented products compared to other products used for similar activities or results;
- The nature of the invention covered by the patent;
- The extent to which the licensee uses the invention, whether the licensee just uses bits of the patented technology;
- The portion of the selling price of the marketed products or of the profit that come from the patented elements;
- The assessment of qualified experts;
- The rates that the licensor and the licensee would have agreed upon if they had reached an agreement in the absence of fraud.

Some of these criteria can only be assessed *ex post* and seem to be specially designed to calculate damages (the antepenultimate one for instance), whereas here the idea is to calculate what a reasonable licence is. However part of the doctrine agrees that these criteria could serve as a basis to determine reasonableness. For instance, Layne-Farrar, Padilla and Schmalensee consider that ‘the majority of these factors are directly applicable to FRAND evaluations in a standard-setting context, especially for patents with a licensing history prior to their inclusion in a standard’.⁹⁴

The advantage of these criteria is that they give clear rules as to the elements that should be taken into consideration by the competition authorities and the courts. In the EU, the ECJ often repeats that it just has a limited jurisdiction over the economic analyses made by the Commission. However, it is able to control whether the Commission made manifest errors in its analyses or if it took into account all the relevant information when taking a decision. In this context, such a list could be used by the European Courts to be sure that all the relevant factors have been analysed and thus create legal certainty.

b) Theories of FRAND

It is interesting to identify the different definitions of FRAND which have been proposed by lawyers or economists. Many authors contributed to the

⁹⁴ Layne-Farrar, Padilla, Schmalensee, ‘Pricing Patents for Licensing in Standard Setting Organizations’ (n 33).

creation of a standard and accurate method to calculate FRAND rates. Some of these found some echoes in antitrust decisions.

First, the numeric proportionality approach consists in pooling SEPs and then proportionally dividing licensing fees between SEP holders. Following this method, a fixed royalty rate is calculated for the standard. Then, the fees are divided between the SEP holders depending on their contribution to the standard. For example, a company which owns ten SEPs for a standard containing 100 SEPs will get 10% of the global fees. This approach, used in some licensing agreements, is however criticised because it does not take into account the fact that some SEPs may be more important than others in a standard.⁹⁵

Secondly, one of the most important and respected work on the issue is Swanson and Baumol's study on the concept of reasonableness. In their paper, these economists held that 'the concept of a "reasonable" royalty for the purposes of FRAND licensing must be defined and implemented by reference to ex ante competition' and assumed that the *ex ante* level of fees should be determined through an 'auction-like process'.⁹⁶

This definition of FRAND found an echo in decisions of competition authorities. The method proposed by the EU Commission in its 2011 guidelines to compare the *ex post* rate (cost of the patent after the industry is locked into the standard) with the *ex ante* rate (before the industry is locked into the standard) is directly taken from this study.⁹⁷ Similarly, in its decision against Rambus, the FTC applied the *ex ante* auction approach in calculating the licensing fees that Rambus may charge for its standard essential patents related to the SDRAM technology.^{98, 99}

Finally, a simpler way to assess whether a FRAND commitment is respected could be to adopt a procedural definition of FRAND. Licensing terms would be FRAND compliant if they are freely negotiated after an

⁹⁵ *ibid.*

⁹⁶ Daniel Swanson, William Baumol, 'Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power' (2005) 73(1) *Antitrust Law Journal* 51.

⁹⁷ 2011 Commission's Guidelines (n 1) 289-290.

⁹⁸ *In the Matter of Rambus Inc* (n 52).

⁹⁹ More details about the *ex-ante* auction method are given by Damien Geradin, Anne Layne-Farrar and Jorge Padilla, 'Competing Away Market Power? An Economic Assessment of Ex Ante Auctions in Standard Setting' (2008) 4(2) *European Competition Journal* 443.

adequate patent disclosure. On the contrary, it would be to the SEP holder to prove that it licensed on FRAND terms if it sues its competitors or if a competitor complains. This presumption would work only if the SEP holder is bound by an SSO's IPR policy.

Whatever the 'best' method to define FRAND is, it should be borne in mind that FRAND may be calculated in different ways depending on the patents, the competitors and the market. As a commentator wrote, 'a one-size-fits-all laboratory solution to FRAND is simply not available'.¹⁰⁰

V. Conclusion

This overview of the competition problems that influence standard-setting process has highlighted some fundamental points. It shows that competition authorities accept standardisation as a source of innovation that benefits to the consumer. Thus, in the last five years, they mainly focused on the practices which threaten the standardisation process, namely patent ambush and refusal to license standard-essential patents on FRAND terms.

To tackle these unilateral practices, competition authorities used anti-monopolisation rules. However, the application of these rules has proven to be difficult, for several reasons discussed above, and there is a debate about whether competition principles are the most adequate rules to prevent the attempts to block the standard-setting process.

Among the reasons why competition rules are not adapted is the absence of competition definition of FRAND licensing terms. FRAND is an IP as well as competition requirement, thus competition authorities should be able to control that licensing rates for standard-essential patents respect the FRAND requirement. This is why clear rules should be established about the procedure to negotiate FRAND terms (auction system for instance) and the calculation of FRAND terms (market oriented or cost oriented, for instance).

Moreover, some other tools may be used in order to repair the damages of anticompetitive behaviour. Contract law is one of these and is particularly efficient in the context of standardisation, because SSOs adopted IPR policies which bind their members. Competition authorities could also try to

¹⁰⁰ Mikko Valimäki, 'A Flexible Approach to RAND Licensing' (2008) 29(12) European Competition Law Review 686.

create per se prohibitions or presumptions which would lighten the burden of the proof. Another solution, which has not been tried, would be to adopt an *ex ante* control by SSOs or an *ad hoc* authority, instead of an *ex post* one based on court proceedings or action of the competition authorities.

As proposed by an author, a kind of light regulatory system could be created, similar to the system designed in the EU for access to physical telecommunication networks (cables etc).¹⁰¹ In this system, SEP holders would have the obligation to negotiate for access to their technologies. In the case negotiations fail, an authority or an SSO may force patent holders to license their standard-essential patents on FRAND terms under their control.¹⁰² In this context, the definition of the concept of FRAND remains the heart of the problem.

¹⁰¹Parliament and Council directive (EC) 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities [2002] OJ EC L 108/7, articles 4, 5, 8 and 12.

¹⁰²Kamiel Koelman, 'An Exception Standardisation: Do We Need an IP Exemption for Standards?' (2006) 37 *International Review of Intellectual Property and Competition Law* 823.

