Chapter 4

Calculating FRAND Licensing Fees: A Proposal of Basic Pro-competitive Criteria

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1 Introduction

The search for balanced criteria in assessing the “fair, reasonable and non-discriminatory” (henceforth “FRAND”) licensing terms for standard-essential patents (henceforth “SEPs”) shall, first of all, focus on a number of guidance criteria which are consistent with the overall evolutionary and pro-competitive juris-political inspiration which has been recently witnessed in the EU, in the USA and also in India.¹ This is of pre-eminent importance, even vis-à-vis the precise, sophisticated calculations, such as those applied by Justice Robarts in the well-known *Microsoft v. Motorola* case.² In practice, indeed, the actual case-by-case fixation of royalties will mostly occur upon private agreements or “arbitrations” (as suggested by Lemley and Shapiro)³ or, in default, by Courts or Competition Authorities’ individual adjudication.⁴

¹This need has been particularly emphasized within the Indian market, which is known for its peculiar and human-rights oriented IP policies, cf. for instance, Raghavi Viswanath, *Demystifying the Indian FRAND Regime: The Interplay of Competition and Intellectual Property*, 21 J. INTELL. PROP. RTS., 90-94 (2016).

²*Microsoft Corporation v. Motorola, Inc.*, No. C10-1823 JLR, 2013 WL 2111217, (W.D. Wa. April 25, 2013).

³Mark Lemley & Carl Shapiro, *A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents*, 28 Berkeley Tech. L. J. 1135 (2013).

⁴Of course depending, country by country, on which institution is more experienced in dealing with economics-related competitive disputes.

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So, consistency with the rationale of the duty to licence on FRAND terms, requests that the actual end result of the negotiation reflects an *ultimately pro-competitive balance* of the conflicting interest at stake, namely the holders'/licensors' right to an appropriate remuneration—appropriate, not maximized (we borrow, as an indication of general scope, from the ECJ in *Premier League*)—and the 'licensees' right to obtain access conditions allowing them effective competitiveness.⁵ This requires, first of all, the elaboration and application of basic criteria functional thereto, preferably to be established by *ad hoc* Guidelines of general application, and even possibly incorporated in regulatory norms—national and/or stemming from international and/or regional agreements. This is to avoid that the pure remittance to private agreements or to adjudications of mere individual scope, might translate, on the one hand, into an harlequin dress obnoxious to the need of (reliability and transparency and) harmonization of the standard-setting context, international by nature and participated by SSOs from all over the world.⁶ And, on the other hand, into the subjugation of willing licensees to the superior contractual might of a licensor interested to maximize royalties, thus raising prospective rivals' costs. Hereafter, in this chapter we submit some criteria that we deem suitable to this purpose. They are four, expressed as progressive joint (cumulative) steps.⁷

⁵Joined Cases C-403 and 429/08, *Premier League Ltd v. QC Leisure and Murphy v. Media Protection Services Ltd.*, 4 October 2011, ¶¶ 108 - 109, where the Court stated that: "the specific subject-matter of the intellectual property does not guarantee the right holders concerned the opportunity to demand the highest possible remuneration. Consistently with its specific subject-matter, they are ensured – as recital 10 in the preamble to the Copyright Directive and recital 5 in the preamble to the Related Rights Directive envisage – only appropriate remuneration for each use of the protected subject-matter." Although the decision relates to copyright remuneration in view of the Copyright Directive recitals, we see no reason why hold that this is not a general principle for IPRs in general.

⁶Satisfying such need would translate in preempting risks of dangerous conflicts of approaches and decisions in different regions of the world, either stemming from 'technical' grounds (given the variety and diverse characteristics of SSOs), or – even more dangerously – fueled by geopolitical divisions.

⁷In the following we will focus on the fundamentally "monetary" aspects of the licensing agreement, i.e. the appropriate criteria to benchmark the patent value to a reasonable remuneration for its holder. However, it is worth pointing out that licensing agreements encompass a wide variety of clauses which shall be taken into account in order to verify their compliance to the FRAND rules (such as: duration, termination upon notice, territorial coverage, grant backs and the like).

2 First Step: Precise Identification of, and Fees' Strictly Proportional to, the Technology to Be Effectively Adopted by the Willing Licensees

At times, courts and scholars have postulated that every patent that is declared essential to a standard would be implemented—and thus potentially infringed—by every product that complies with said standard.⁸ This assumption seems to be grounded on the following syllogism: because (i) the patent has been declared essential to a standard; and (ii) the product is compliant with the standardized technology; therefore (iii) the product must implement the patented technology.⁹

However, this assumption seems flawed by an imprecise understanding of the standard-setting rules, resulting in a fundamentally false syllogism. Indeed, not all patents that have been disclosed as essential are necessarily infringed by all products that are compliant with the standard at stake. In other words, there is no automatic infringement.¹⁰ This is for three reasons, relating to the patent's validity, its essentiality for the standard and, most importantly, to the existence of optional features in many standards.

As a first consideration, it is quite obvious that the patent(s) at stake may be invalid or non-essential. On the one side, the number of effectively “strong” patents, meaning those that would survive an invalidity attack is notoriously low. Where some have suggested that, within some jurisdictions, the majority of granted patents

⁸A couple of examples of said theory may be drawn from Italian case-law on standard essential patents, cf. Court of Genoa (ord.), (8 May 2004), *Koninklijke Philips Electronics N.V. v. Computer Support Italcord s.r.l.*, published in *Giur. ann. dir. ind.* 4949 (2006); *Italtel S.p.A. v. Sisvel et al.*, Court of Milan, (8 May 2008), available on <https://www.darts-ip.com>; *Giur. ann. dir. ind.*, Court of Trieste, 23 August 2011, 5951 (2013). The same assumption is found in M. Franzosi, *Royalty per uso di brevetto standard: but for, Georgia Pacific, apportionment*, *I RIV. DIR. IND.*, 259 (2015).

⁹A recent publication [Miguel Rato & Mark English, *An Assessment of Injunctions, Patents, and Standards Following the Court of Justice's Huawei/ZTE Ruling*, 7 *J. OF EUR. COMPETITION L. & PRAC.* 103 (2015)] suggests that the ECJ would have made the same assumption in the landmark Huawei/ZTE decision, where it held that “the fact that [a] patent has obtained SEP status means that its proprietor can prevent products manufactured by competitors from appearing or remaining on the market” [Case C-170/13, *Huawei Techs. Co. Ltd. v. ZTE Corp.*, Euro. Ct. Justice, (16 July 2015), emphasis added, ¶ 52 (hereinafter “Huawei/ZTE”)]. Indeed, from the ECJ's wording, one may infer that the SEP status acquired by a particular technology, alone, would automatically imply that every standard-compliant product does implement said technology. It shall be noted, however, that the ECJ, within this judgement, also expressly recognized that “alleged infringer cannot be criticised either for challenging, in parallel to the negotiations relating to the grant of licences, the validity of those patents and/or the essential nature of those patents to the standard in which they are included and/or their actual use, or for reserving the right to do so in the future” (¶ 69 and *passim*). Nevertheless the Court does not address the potential optionality of a specific technical feature, for which cf. further ahead.

¹⁰Cf. *supra* note 8.

would be at least partially invalid,¹¹ the available data on SEPs would confirm this to be an exacerbated problem in the standard-setting context.¹² On the other side, the essentiality disclosure that SEP holders file before SSOs is a wholly unilateral act, which in most cases is not substantively examined nor weighed in any way by the organization. For instance, the ETSI Guide on Intellectual Property Rights states that, “ETSI has not checked the validity of the information, nor the relevance of the identified patents/patent applications to the ETSI standards and cannot confirm, or deny, that the patents/patent applications are, in fact, essential, or potentially essential”.¹³ Because of this, the so-called over-disclosure phenomenon—*i.e.* claiming essentiality for a non-essential patent—is considered to be wide-spread.¹⁴

However, both arguments do not appear very useful for the purposes of determining a FRAND rate: granted patents are presumptively valid and, to our knowledge, no major SSO is involved in a substantive examination of the disclosed patent’s essentiality.

Conversely, in order to establish general principles on how FRAND royalties must be assessed, it is best to focus on the intrinsic characteristics of technological standards, especially in the ICT sector.

¹¹For recent publications and discussion on patent invalidity data in Germany, see Peter Hess et al., *Are Patents Merely “Paper Tigers”?*, (2016) available at https://www.bardehle.com/fileadmin/Webdata/contentdocuments/broschures/Patent_Papiertiger.pdf; in reply, see Aloys Hüttermann, *Patents – Paper Tigers or Real Tigers?*, in *Mitteilungen der deutschen Patentanwälte*, 101 (2016) available at <http://ssrn.com/abstract=2773628>. Comments and references on both works can be found on The IPKat on-line blog, available at <http://ipkitten.blogspot.com/>. On the other side, patenting rates are rapidly increasing. For instance, see EPO statistics, whereby the number of total patent applications has been constantly growing for the past five years, available at <http://www.epo.org/about-us/annual-reports-statistics/annual-report/2015/highlights.html>.

¹²A 2013 study by Kang and Bekkers closely reviewed the patenting strategies of 3GPP standardization meetings participants, finding out high numbers of “just-in-time” patent applications, filed immediately before or during said meetings mostly by vertically integrated European firms, which showed allegedly low inventive merit and could be seen as more likely to be invalidated in court, cf. Byeongwoo Kang & Rudi Bekkers, *Just-in-time Patents and the Development of Standards*, 44 RES. POL’Y, 1948 (2015).

¹³See *ETSI Guide on Intellectual Property Rights* (‘IPRs’), 19 September 2013, available at <http://www.etsi.org/images/files/IPR/etsi-guide-on-ipr.pdf>; The ETSI Guide is a document providing further information and clarifications for applying the institute’s IPR Policy. Cf. also Huawei/ZTE ¶¶ 20 and 69.

¹⁴See the study commissioned by the European Commission and drafted by researchers at the Fraunhofer Gesellschaft, Knut Blind et al., *Study on the Interplay Between Standards and Intellectual Property Rights (IPRS)*, 63-65 (April, 2001) available at http://www.iplytics.com/download/docs/studies/ipr_study_final_report_en.pdf. See also a number of studies conducted by Fairfield Resources International, Inc. on 3G, GSM, WDCMA and LTE standards from 2005 to 2010, where the company reviewed the patents declared as essential for those standards, and valued that the overall percentage of essential/probably essential patents varied between 30 and 50% (cf. <http://www.frlicense.com/recent.html>). Similar surveys were realized by Cyber Creative Institute Co. Ltd. in relation to the LTE standard, whereby the percentage of truly essential patents was weighed around 50% (cf. <http://www.cybersoken.com/en/research/lte/>).

Standards are complex sets of rules. They are continuously updated and amended by working groups and dedicated experts. For instance, the well-known 3G/UMTS standard for telecommunications was improved by way of several subsequent “releases” and accounts for hundreds of technical specifications (i.e. analytical documents addressing one specific function of the system). In turn, technical specifications are often modified and published, usually more than once for every release of the standard.¹⁵ As a result of such relentless activity, standards often end up comprising both progressively added and “optional” technical features.¹⁶

The technical features (and specification) of a standard may be “optional” in relation to a specific product implementing the said standard in three different ways.¹⁷ In the first place, technical features often concern just one of the elements of the standardized system. For instance, the portions of the standard relating to mobile devices may not regulate the functioning of mobile infrastructures, such as the network itself, and vice versa. In the second place, a technical feature which is added in a specific version of the standard, released after certain products have been placed on the market, will not be (necessarily) implemented by those earlier products. In the third place, a feature of the standard may be optional in the sense that the producer can freely decide, from the outset, whether to implement such technology or not, without affecting the product’s interoperability.

¹⁵The first version of the UMTS standard was published as “Release ‘99” in the early 2000s. From then on, Releases 4 to 9 have been published, almost accounting for a new release every year. As to technical specifications, the one on “Spreading and modulation (TDD)”, i.e. TS 25.223, for instance, was published in six different versions under release 4, namely version 4.1.0, 4.2.0 and so on (cf. <http://www.3gpp.org/DynaReport/25223.htm>). The UMTS standard evolved into the LTE standard, for which Releases 10-14 have been drafted. The industry is now developing the 5G standards. For additional information, cf. *The Third Generation Partnership Project (3GPP)* at <http://www.3gpp.org/>.

¹⁶ETSI as well, in defining the concept of standard for its purposes, allows that it “shall mean any standard adopted by ETSI including options therein or amended versions”, see ETSI Intellectual Property Rights Policy, in ETSI Rules of Procedure, Annex 6, 18 November 2015, at 42. The very UMTS standard thus allows for alternative implementation choices in the radio interface and/or optional features. For instance, Knut Blind et al. *supra* note 14, at 65, suggest that there are “standards that allow for several implementations choices” such as the “UMTS [that] specifies both a so-called FDD and TDD radio interface option”. See also Jay P. Kesan & Carol M. Hayes, *FRAND’s Forever: Standards, Patent Transfers, and Licensing Commitments*, 89 IND. L. J. 241 (2014), which introduced the concept of noncore patents, i.e. those essential patents relating to optional features.

¹⁷The following examples are suggested in: European Commission, *Patents and Standards, A modern framework for IPR-based standardization, Final Report (2014)*, at 115-116, available at http://ec.europa.eu/growth/industry/intellectual-property/patents/standards/index_en.htm.

If a specific feature of the standard is indeed optional, any patent that is declared as essential for that feature is only optionally implemented by the competitor's products placed on the market. Therefore, in all the above mentioned cases, the infringement of the SEP covering said optional technical features is merely potential. These considerations cannot be ignored in an attempt to determine a FRAND royalty. If a product does not implement a certain patented technology, why would it need to remunerate the patent owner for it? This nevertheless, the issue of optionality is often disregarded in real-world negotiations.

Besides, it is generally understood that a feature's optionality, as of itself, does not hinder the possibility for the relative patent to be *sensu stricto* essential. The patent at stake may well be essential, but only in relation to such optional feature. This is expressly confirmed, for instance, in the Standard Board Bylaws of the IEEE which convey that: "‘Essential Patent Claim’ shall mean any Patent Claim the practice of which was necessary to implement either a mandatory or optional portion of a normative clause of the IEEE Standard".¹⁸ According to a 2013 study, seven of the most important SSOs include optional portions of the standard in the definition of essentiality.¹⁹

All this considered, we suggest that a first step for determining any FRAND royalty is to abide by a principle of strict proportion between the patented subject-matter and the standardized technology that is used by the licensee.

Only when the interference is effective, so that the essential patent is or will be effectively infringed by the competitor's product, the implementer shall be burdened by the obligation to pay FRAND royalties to the SEP holder. Symmetrically, it is only when the SEP is effectively implemented or infringed that the compensation for its use can be deemed fair and reasonable. This evaluation shall be made prior to any request for compensation by the SEP holder itself, as he is ostensibly the only subject with sufficient knowledge of the patents and standard at stake.

More specifically, at the beginning of the negotiations, the SEP holder should: (i) provide to the potential licensee claim-charts (or similar documentation), showing how the patent can be read on the technical specification of the standard;

¹⁸IEEE, *IEEE-SA Standards Board Bylaws*, 15 (December, 2016), available at <http://standards.ieee.org/develop/policies/bylaws/index.html>.

¹⁹Rudi Bekkers & Andrew Updegrave, *IPR Policies and Practices of a Representative Group of Standards-Setting Organizations Worldwide*, 58 (2012), <http://ssrn.com/abstract=2333445>. However, the authors convey that there are other SSOs who do not mention distinctions between mandatory, optional and alternative elements. Cf. also in *Microsoft v. Motorola*, "Importantly, however, because an "essential" patent is one that is necessary to implement either an optional or mandatory provision of a standard, a specific SEP may contribute greatly to an optional portion of a given standard, but if that portion is not used by the implementer, the specific SEP may have little value to the implementer", *Microsoft v Motorola*, *supra* note 2 at 40.

(ii) assess whether those technical specifications constitute mandatory or optional portions of the standard for the products at stake; and (iii) in case of optional portions, the SEP holder should also show that the products at stake effectively implement those portions of the standard.²⁰ In the latter case, however, the SEP holder shall not provide full evidence of the effective implementation for the purposes of negotiating a license, as this would likely constitute an excessive burden for him; *prima facie* evidence would amount to a sufficient basis for the negotiation stage. Potential licensee may then be in the position to rebut such evidence, showing that the patent(s) at stake would not be effectively implemented within its products.

3 Second Step: Royalties Determination Ex ante, i.e., Taking into Account the Value of the Patent Prior to the Standard Setting

Once the standard-essential technology to be licensed has been circumscribed, the value of said technology—more specifically: the value of the patents covering said technology—must be assessed for the purposes of determining the FRAND royalty.

The standard selection process plays a fundamental role in the creation of value. Prior to the adoption of a standard, several technological alternatives for the same functionality usually compete as to which will be elected within the standard. In the commonly typified situation, different technological solutions will be weighed against each other by the SSO's members on the basis of their quality, their price and their added-value to the standard, in order to determine which will better fit the industry's needs.

However, when the standard is finally adopted, the owners of the IP rights covering the chosen technologies will see a dramatic increase of their patent's market power. This is because the SEPs will be implemented—within the optionality limits explained above—by every manufacturer within that sector, potentially allowing the SEP holder to extract revenues and even to “hold-up” competitors with requests for supra-competitive fees, paired up with the threat of an injunction.²¹

²⁰The *Huawei/ZTE* decision too, in a noteworthy passage, seems to suggest the criteria of strict proportionality and to establish the burden of proof on the SEP holder, stating that before bringing an action for prohibitory injunction, a patent holder must “alert the alleged infringer of the infringement complained about by designating that SEP and specifying the way in which it has been infringed”, cf. *Huawei/ZTE*, *supra* note 9, ¶ 61.

²¹The theory of hold-up—meaning, in the words of Judge Robart, “the ability of a holder of an SEP to demand more than the value of its patented technology and to attempt to capture the value of the standard itself”, in *Microsoft v. Motorola*, *supra* note 2, at 21—has been widely discussed among scholars. Nevertheless, it appears to fall outside the scope of the present contribution to get involved in such fascinating matter. For the essential literature on this topic please refer to Jorge

Conversely, those patents that have not been adopted may turn out to be worthless, especially if there is no market for those technologies other than the standardized one.²²

Against this background, the vast majority of scholars, economists and courts seem to agree on that a “reasonable” royalty should reflect only the value of the patent *qua* patent, and not the value potentially associated to its inclusion in the standard.²³ Swanson and Baumol were among the first scholars to suggest, in an influential article published in 2005, that “the concept of a ‘reasonable’ royalty for purposes of RAND licensing must be defined and implemented by reference to ex ante competition, i.e. competition in advance of the standard selection”.²⁴ A few years later, Lemley and Shapiro conveyed that “[b]y construction, the reasonable royalty rate does not include the value attaching to the creation and adoption of the standard itself. To allow the patentees to capture that value, which flows from the collective adoption decisions of the group rather than from the underlying value of the technology chosen, would undermine the goals of the FRAND commitment”.²⁵

(Footnote 21 continued)

Contreras’s comprehensive literature review, *Patents, Technical Standards and Standards-Setting Organizations: A Survey of the Empirical, Legal and Economics Literature* 13 (2015) available at <http://ssrn.com/abstract=2641569>. Besides, some have noticed that the potential for hold-out (or reverse hold-up) – i.e. the behaviour of implementers who wish to pay low or no royalties, e.g. by adopting delaying tactics or by refusing altogether to pay due licenses at FRAND terms – would constitute an equally concerning issue. An occurrence of hold-out, the implementers either delay the negotiations as much as possible. In this regard, *cf. id.* *Cf. also*, Pedro Henrique D. Batista & Gustavo C. Mazutti, *Comment on “Huawei Technologies” (C-170/13): Standard Essential Patents and Competition Law – How Far Does the CJEU Decision Go?*, 47 IIC 249 (2016), maintained that the CJEU’s *Huawei v ZTE* decision “etiquette” would have minimized the effect of both hold-up and hold-out issues.

²²Herbert J. H. Hovenkamp, *Competition in Information Technologies: Standard-Essential Patents, non-practicing entities and FRAND bidding*, UNIV. IOWA LEGAL STUD. RES. PAPER, No. 12-32, 12, available at <http://ssrn.com/abstract=2154203>.

²³*See, for instance*, Thomas F. Cotter, *The Comparative Law and Economics of Standard Essential Patents and FRAND Royalties*, 22 TEX. INTELL. PROP. L.J. 311 (2014), available at http://scholarship.law.umn.edu/faculty_articles/237; Josh Lerner & Jean Tirole, *Standard-Essential Patents*, 123 J. OF POL. ECON. 3 (2015), available at <http://www.journals.uchicago.edu/doi/citedby/10.1086/680995>; *Cf. also* *Microsoft v. Motorola supra* note 2, ¶¶ 25 and 26, as well as the well-known decision of Judge Posner in *Apple Inc. v. Motorola Inc.*, 869 F. Supp. 2d 901, 911, 18 (N.D. Ill. 2012).

²⁴Daniel Swanson & William Baumol, *Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and the Control of Market Power*, 73 ANTITRUST L. J. 10 (2005).

²⁵Mark Lemley & Carl Shapiro, *A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents*, 28 BERKELEY TECH. L.J. 1148 (2013).

Similar *ex ante* approaches have been endorsed by the Federal Trade Commission,²⁶ the European Commission²⁷ and, most recently, within the IEEE Bylaws.²⁸

The *ex ante* approach provides a first benchmark for what constitutes a FRAND royalty. In simple terms, the *ex ante* approach points to the reasonable royalty that the SEP holder could have obtained in an arms-length hypothetical negotiation with the prospective implementer just before the standard was adopted, whereas the adoption of the standard flags the *ex post* moment, when the patent has been included in the standard, thus potentially gaining substantial added-value on the market (when not a dominant one). The underlying assumption is, of course, that only an *ex ante* royalty would reflect the intrinsic value of the patent in a competitive environment.²⁹

²⁶Fed. Trade Comm'n, *The Evolving IP Marketplace, Aligning Patent Notice and Remedies with Competition*, (March, 2011), available at <https://www.ftc.gov/reports/>, suggest "Recommendation Courts should apply the hypothetical negotiation framework to determine reasonable royalty damages for a patent subject to a RAND commitment. Courts should cap the royalty at the incremental value of the patented technology over alternatives available at the time the standard was chosen".

²⁷European Commission, *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-operation Agreements*, 61 (Jan. 14, 2011), suggests that "[i]n 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 (1). In general, there are various methods available to make this assessment. [...], 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". It shall be noted that the EU Commission's approach may be read as somehow more cautious towards an *ex ante* royalty determination principle, as it may suggest only to "compare" the *ex ante* and *ex post* licensing fees charged by the patent holder.

²⁸IEEE Bylaws, *supra* note 18, at 16, emphasis added: "'Reasonable Rate' shall mean appropriate compensation to the patent holder for the practice of an Essential Patent Claim excluding the value, if any, resulting from the inclusion of that Essential Patent Claim's technology in the IEEE Standard".

²⁹In addition to that, most theoretical contributions adopting the *ex ante* approach argue that the reasonable royalty for a SEP should be capped to the incremental value of that patent over the next-best technological alternative before the standardization. See Mark Lemley & Carl Shapiro, *supra* note, 25 at 1148; Joseph Farrell et al., *Standard Setting, Patents, and Hold-Up*, in 74 ANTITRUST L.J. 611 (2007). The latter authors clarified the meaning of "incremental value" – and thus their theoretical stance on the matter – by way of the following example: "consider the choice between a patented production technology and an unpatented alternative. The two technologies yield the same output, so the technology user simply seeks to minimize cost. Suppose that the patented technology requires the user to bear costs of \$40, not including any royalty, and the alternative technology requires the user to bear costs of \$50. The user would be willing to pay a royalty of up to the patented technology's inherent advantage of \$10. This inherent advantage typically allows the patent holder profitably to charge a positive price (more generally, a price above marginal cost), perhaps \$6 in this example". In this (oversimplified) case the incremental value is set at \$10. This amount should constitute the benchmark for the maximum reasonable royalty.

From our perspective, the *ex ante* approach constitutes a fundamental criteria for determining a “reasonable” licensing rate. Given the underlying principle that, in order to be pro-competitive, the FRAND royalty must also be appropriate and not maximised, it seems rather logical to cap the reasonable royalty to the intrinsic value of the patent before it acquires inevitable (and possibly “hold-up”) power following its inclusion in the standard.

However, this rule is to be applied ultimately when and if, given the specific circumstances of the case, there are (or were) available alternative and comparable technologies providing similar added-value to the standard, which may be used for determining the effective *ex ante* value of the patent. For the same purposes, one may also consider whether licensees for that same specific technology had been stipulated prior to the election within the standard.

(Footnote 29 continued)

If the general principles underlying the *ex ante* approach are rather straightforward, a number of issues emerged in their practical implementation (cf. JONATHAN FAULL & ALI NIKPAY, *THE EU LAW OF COMPETITION* (2014) ¶¶ 4.775-4.780). In particular, whereas some have argued that capping the FRAND rate to the incremental value of the SEP, although theoretically sound, may lack “real-world applicability” [Judge Robart in *Microsoft v. Motorola*, *supra* note 2, at 26, others have contended that to limit the holder’s remuneration to its incremental value could substantially undermine its investments and deter from further participation in the standard-setting process in the future.

As to the first objection, the prerequisite for assessing the incremental value of a technology over its next-best alternative is that there was, at the very outset, an available alternative. Lacking a valid alternative, it may be questioned if the “incremental value” criterion would still hold. In addition to this, some have also suggested that “if two technologies have different values it is not clear whether they actually qualify as true alternatives” Damien Geradin, *Pricing Abuses by Essential Patent Holders in a Standard-Setting Context: A View from Europe*, paper prepared for the “The Remedies for Dominant Firm Misconduct” Conference June 4-5, 2008 – University of Virginia, available at <http://ssrn.com/abstract=1174922>, that the determination of technological value is an inherently subjective one and that the factors to be taken into account would be too complex (Anne Layne-Farrar & Gerard Llobet, *Moving beyond simple examples: Assessing the incremental value rule within standards*, 36 INT’L J. INDUS. ORG., 57 (2014)).

As to the second objection, many authors have put into question the incremental value criterion from a conceptual standpoint. Geradin, for instance, argued that, even assuming that the incremental value can be calculated, due to the underlying economic model, “the rate that would have prevailed *ex ante* could indeed be equal to – or at least near – zero”, being that it only reflects a competitive outcome: “To take a trivial example, if customer A buys shampoo X rather than shampoo Y, which is a close alternative, A will not pay the incremental value between X and Y, but rather the full price of X, ostensibly reflecting the average value of using shampoo X” (Geradin, *id.* at 18; see also J. Gregory Sidak, *The Meaning of FRAND, Part I: Royalties*, 9(4) J. COMPETITION L. & ECON. 972, 984 (2013). Moreover, according to Geradin, a royalty rate that was limited to the incremental value of the standardized technology would often fail to adequately compensate the SEP holder (Geradin, *id.*).

4 Third Step: Looking at the Overall Licensing Scenario and Royalty Stacking Issues

The determination of the license fees should also take into account the overall licenses' scenario that may encumber potential licensees. This should lead to reckon with the fact that in the standard-setting context, in particular within the ICT sector, hundreds of patents may insist on a single final product, so that the implementers are normally obliged to pay royalties to multiple SEP holders. Ignoring this problem might determine a disproportionate "royalty stacking", potentially exceeding a reasonable portion of the product's value and price—hence crippling its market and/or discouraging the producer from the very adoption of the standard.

As a matter of fact, given that the sheer number of SEPs in the ICT sector and, more generally, in the electronics industry is very high,³⁰ many have argued there are serious chances for implementers to be burdened by a burdensome "stack" of royalty demands. For instance, an empirical research conducted in 2014 came to the conclusion that the potential royalty demand over a \$400 smartphone would amount to a \$120 stack, *i.e.* to 30% of the end product's price and almost equal to the cost of the device's components.³¹

An occurrence of "royalty stacking" clashes with the very concept of FRAND, as it cannot be deemed to be fair, nor reasonable, for the aggregate licensing fees to make "commercialisation of products compliant to the standard uneconomical or unprofitable".³² Lemley and Shapiro add that the "royalty stacking" existence would exacerbate the hold-up problem, by multiplying the chances for an implementer to face infringement claims and supra-competitive price demands.³³ Obviously, the possibility of a "royalty stacking" is not dependent from the licence stipulated by the individual SEP holder, but rather from the aggregate amount of all SEP-related licenses. A number of decisions rendered in the US have recognized the potential harm caused by royalty stacking issues. In the 2013 *Microsoft v. Motorola* case, Judge Robart famously held that "a proper methodology for determining a RAND royalty should address the risk of royalty stacking by considering the aggregate royalties that would apply if other SEP holders made royalty

³⁰A quick look at the ETSI database would account for 195.038 SEPs, cf. <https://ipr.etsi.org/>; whether other sources point to anything in between 100.000 (Alexander Italianer, *Shaken not stirred. Competition Law Enforcement and Standard Essential Patents*, speech rendered in Brussels (21 April 2015) available at http://ec.europa.eu/competition/speeches/text/sp2015_03_en.pdf) to 345.000 SEPs (Franzosi, *supra* note 8, at 262).

³¹Ann Armstrong et al., *The Smartphone Royalty Stack: Surveying Royalty Demands for the Components Within Modern Smartphones*, <http://ssrn.com/abstract=2443848>. Please note that the paper only takes into account the offered and face value of the licenses at stake, so that it does not consider any actual negotiation (however likely it is) between the parties.

³²ANNE LAYNE-FARRAR, *THE ECONOMICS OF FRAND*, IN *THE CAMBRIDGE HANDBOOK OF ANTITRUST, INTELLECTUAL PROPERTY, AND HIGH TECH HANDBOOK* (Roger Blair & Daniel Sokol eds., 2017).

³³A seminal scientific contribution in this regard is Mark Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, in 85 *TEX. L. REV.* 1991 (2007).

demands of the implementer”, and that the potential for royalty stacking should be taken into account by SEP holders when setting prices.³⁴ Similar opinions have been rendered by the EU Commission,³⁵ the FTC³⁶ and, quite recently, by the Competition Commission of India (CCI), which pointed out to the fact that “FRAND licenses are primarily intended to prevent patent hold-up and royalty stacking”.³⁷

However, legal scholars and economists have raised substantial objections against the royalty stacking theory. Many argued, for instance, that it fails to duly take into account the “reductionist” impact of common practices such as cross-licensing, the possible non-exertion of patent rights and the real-world market dynamics (which would punish those companies that set excessive royalties). What is more, several authors underlined that there would be no empirical evidence of a royalty stacking phenomenon, at least enough to cause any kind of serious public concern.³⁸ Taking a stance in this debate, the Federal Circuit in *Ericsson v. D-Link* assessed that, while “royalty stacking” may be a potential problem posed by SEPs, in order for it to be weighed the defendants had to present evidence of an “actual” royalty stack, which could not be simply presumed.³⁹

All in all, the existence and the issues possibly raised by royalty stacking, though much discussed, did not gather substantial consensus among academics and practitioners. On the one side, common sense would suggest that if hundreds, if not thousands of patents, insist on a single product, the royalty stacking is—to say the least—likely. On the other side, there may be cases where the potential for a royalty

³⁴Cf. *Microsoft v. Motorola*, § 72; later reprinted by Judge Holderman in *In re Innovatio IP Ventures, LLC Patent Litigation*, 2013 WL 5593609 (N.D. Ill. Oct. 3, 2013).

³⁵Yann Ménière, *Fair, Reasonable and Non-Discriminatory (FRAND) Licensing Terms, Research Analysis of a Controversial Concept*, a publication sponsored by the Joint Research Centre, available at <http://is.jrc.ec.europa.eu/pages/ISG/EURIPIDIS/documents/05.FRANDreport.pdf>.

³⁶U.S. Dep’t of Justice & Fed. Trade Comm’n. (2007). Antitrust enforcement and intellectual property rights: promoting innovation and competition, 61, available at <https://www.ftc.gov/sites/default/files/documents/reports/antitrust-enforcement-and-intellectual-property-rights-promoting-innovation-and-competition-report.s.department-justice-and-federal-trade-commission/p040101promotinginnovationandcompetitionrpt0704.pdf>.

³⁷Cf. for instance, *Best IT World (India) Private Ltd. v Telefonaktiebolaget LM Ericsson*, Case No. 4 of 2015, Competition Commission of India 5 (12 May 2015), available at <http://www.cci.gov.in/May2011/OrderOfCommission/261/042015.pdf>.

³⁸For a recent example: J. Gregory Sidak, *Apportionment, FRAND Royalties, and Comparable Licenses After Ericsson v. D-Link*, U. ILL. L. REV. 1809 (2016), available at <https://www.criterioneconomics.com/publications.html>; see also Damien Geradin & Miguel Rato, *Can Standard-Setting lead to Exploitative Abuse? A Dissonant View on Patent Hold-Up, Royalty Stacking and the Meaning of FRAND*, 3 EUR. COMPETITION J. (2007); Alexander Galetovic & Kirti Gupta, *Royalty Stacking and Standard Essential Patents: Theory and Evidence from the World Mobile Wireless Industry*, (June 2016) http://www.law.northwestern.edu/research-faculty/searlecenter/events/innovation/documents/Galetovic_Royalty_stacking_060416_GG.pdf.

³⁹Cf. *Ericsson v. D-Link*, 773 F.3d 1201, 1234 (Fed. Cir. 2014), “The mere fact that thousands of patents are declared to be essential to a standard does not mean that a standard-compliant company will necessarily have to pay a royalty to each SEP holder”.

stack is neutralized (by way of cross-licensing, lowered prices, patent exhaustion, and so on) or absent.

Within this context, we hold that an occurrence of royalty stacking is nevertheless irreconcilable with FRAND requirements in any case where the expected outcome is a licensing fee that minimizes or eliminates any profit on the standard-implementing product. In order to neutralize such risk, negotiating parties must take the overall licensing scenario into account and rely on the available data when setting the royalty fees: SEP negotiations do not take place in a vacuum. Besides, most standards have been in place for years now and even when upgraded, they are usually improved gradually, within time. Therefore, parties attempting to negotiate a FRAND license will likely have some degree of understanding of the relevant licensing scenario, which—may that be the case—could be enough to weigh in a certain degree of stacking. On the contrary, if no information on the overall context is available, the parties may discuss a *prima facie* FRAND license, possibly coupled with a re-adjustment clause over the fee in case of changes in circumstances.⁴⁰

These first considerations shall be backed up by regulatory and/or normative provisions, whereby the importance of referring to the overall scenario for the purposes of assessing FRAND royalties would be acknowledged.

Once again, the IEEE bylaws constitute a guidance example in this regard, as they suggest that the reasonable rate's determination shall include the consideration of "[t]he value that the Essential Patent Claim contributes [...] in light of the value contributed by all Essential Patent Claims for the same IEEE standard practiced in that Compliant Implementation".⁴¹ Similar instances should be implemented by other SSOs, under the Competition Authorities' guidelines and/or, eventually, by amending multilateral international treaties (such as: TRIPs Agreement).

5 Fourth Step: Dynamic Approach to FRAND Royalties' Determination

Finally, we consider that FRAND royalty rates should also be accounted for in a dynamic and innovation-oriented perspective. Innovation is, by definition, rooted into the ICT sector. Where new products are constantly introduced into the market, the standardization process is characterized by an ever-evolving nature. This is

⁴⁰It is further suggested that a first remedy for royalty stacking would be for SSOs to implement better informative systems, which would enable implementers to get a sense of the SEP patents covering the portion of the standard at stake: think of the ETSI ipr.etsi.org website. This could speed up a cross-researches by which perspective implementers may have – at the outset – general information over the licensing context thus allowing them to conduct better negotiations. At the same time, the possibility to quickly overview the SEP scenario for a particular portion of the standard would not be an excessive burden when negotiating portfolio licenses.

⁴¹IEEE Bylaws, *supra* note 18, at 16.

clearly reflected also by the incessant patenting activity which takes place on most technical features relating to each standard in the sector.

Therefore, it is here suggested that any license negotiation concerning SEPs needs to take into account the dynamic evolution of ICT products, standards and patents in order to be compliant with FRAND terms. The underlying idea is that FRAND terms are to be determined in relation to the overall licensing scenario, as expressed in the previous part. Moreover, it is herein submitted that, because the licensing scenario is subject to rapid changes, the line between what is FRAND and what is non-FRAND may shift in time.

For instance, if “new” SEPs are discovered as being implemented by certain product(s)—whereby the parties did not take into account said rights when assessing the FRAND licensing rate either because these rights were not published or otherwise ignored⁴²—it may be necessary to modify the negotiated royalties in the light the value and FRAND fees of the “new” SEPs.⁴³

Besides, if the licensing agreement is drafted in broad terms, generally encompassing all the licensee’s products (as it is usually the case for FRAND agreements), the FRAND rates may need to be adjusted to take into account the evolution of the standard. A license that the parties negotiated for all implementing products in 2014 may be compliant to FRAND obligations and yet, in consideration of major evolution both in the standard and patenting landscape which took place in 2016, become excessively onerous for all newly released products.⁴⁴

Furthermore, the overall licensing scenario may also be appreciated from a “*subjective*” point of view. As a matter of fact, if the SEP holder has established a FRAND rate that adequately remunerates its inventive efforts in relation to a certain number of licensees (say, 5), the same rate may end up over-compensating him, in case the number of licensees grows (say, 25).

In conclusion, it is here submitted that FRAND terms shall be read as providing for a *permanent adjustment mechanism*, whereby changes and modifications in the technological and proprietary scenario are duly taken into account and calibrated on the industry dynamics. The said mechanism might well be contractually agreed upon—thus foreseeable from the start of negotiations. It might also involve in default, ADRs or formally arbitral resolution under pre-definite criteria.

⁴²Cf. C-170/13, *Huawei v. ZTE*, *supra* note 9, ¶ 62, where the Court held that “in view of the large number of SEPs composing a standard such as that at issue [...], it is not certain that the infringer of one of those SEPs will necessarily be aware that it is using the teaching of an SEP that is both valid and essential to a standard”.

⁴³As suggested also by Franzosi, *supra* note 8, at 267.

⁴⁴The same reasoning may apply to a situation where a number of licensed patents within the SEP portfolio expire and/or are invalidated.

6 Conclusion

Might a wide consensus on these principles, and others of corresponding proportionate pro-competitive inspiration, be reached, the optimal seat for their embodiment would be by international or regional agreements (e.g. by addenda to Article 31 TRIPs or to the ASEAN treaty) or by *ad hoc* EU Horizontal Directive or EU Commission Guidelines. By default, each country should incorporate them in *ad hoc* Guidelines, entrusting their application to Judiciary Courts or Competition Authorities—whichever deemed more experienced and sophisticated in dealing with IP licensing disputes.

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