Part II. Standards-Setting and Competition Policy

A. The Standards-Setting Process

i. Economic Benefits of Formal Standardisation

The mainstream view of formal, cooperative standardisation recognises its significant pro-competitive potential and its promised benefits to consumers. Amongst them, enhanced interoperability, allowing for wide technology adoption and dissemination, growth of network-based markets and boost in consumer confidence that products will work together as described.[6]

Policy makers in major jurisdictions share the belief that cooperative standards-setting, by enhancing interoperability, is contributing to the emergence of dynamic, competitive and efficient network markets. The European Commission has repeatedly stressed the important benefits of achieving interoperability between individual devices, such as enhanced competition between the manufacturers of consumer products, lower prices, increased output and choice, realisation of positive network externalities for consumers.[7]

Recognising the essentially pro-competitive nature of the standards-setting process, the European Commission provided in its 'Horizontal Guidelines' a safe-harbour framework for the operation of SSOs.[8] According to the Commission standardisation agreements will generally fall outside the ambit of Article 101(1) TFEU against restrictive agreements provided that four conditions are met: *unrestricted participation* to the standards-setting process, *transparency* of the standard adoption, *no obligation to comply*

---

6 Layne-Farrar and Padilla, *Assessing the Link between Standard Setting and Market Power,* p.9 (2010). Available at http://ssrn.com/abstract=1567026..

7 See European Commission, *Guidelines on the applicability of Article 101 TFEU to Horizontal Cooperation Agreements*, [2001] OJ C3/2, at 258, 300; Commission Decision, *Google/Motorola Mobility* (Case COMP/M.6381)[2012], para 46; Commission Decision, Case Number AT.39939 – *Samsung* (29/04/2014), para 22.

8 Horizontal Guidelines, *supra* n. 7, para 263.

imposed to participants, access to the standard on *fair, reasonable and non-discriminatory terms*.[9]

The antitrust authorities in the US have also underscored the important contribution of cooperative standards-setting in achieving interoperability with all its benefits for consumers, businesses and the economy as a whole. The Department of Justice in its 'Joint Statement' with the US Patent and Trademark Office (USPTO) acknowledged the important contribution of standardisation in interoperability between independent devices and, subsequently, in the growth of modern, high-tech network markets, such as the markets for mobile computing devices, on which consumers have come to rely.[10]

However, policy makers' focus on interoperability, incontestable as its benefits for economic efficiency and consumer welfare might be, might still miss some important and more nuanced aspects of formal standardisation. A proper evaluation of the benefits accrued by cooperative standard setting cannot but start from the premise that it is not the *only* way of achieving interoperability in network markets. *De facto standardization*, i.e. the uncoordinated emergence of a technical solution as dominant in the market, can also claim interoperability benefits and it is indeed a frequently observed market phenomenon.[11]

That said, the considerable costs that come with *de facto* standardisation are well established in microeconomics literature. Rivals in *de facto* standardisation engage in what could be essentially viewed as a winner-takes-all 'standardisation race'.[12] Although competition prior the emergence of a standard is fierce, once the industry is locked-in, the winner of

---

9 Ibid, para 280.

10 US DOJ and USPTO, *Policy Statement on Remedies for Standard-Essential Patents subject to Voluntary F/RAND Commitments* ('Joint Statement'), 8 January 2013, p.3, available at http://www.uspto.gov/about/offices/ogc/Final_DOJ-PTO_Policy_Statement_on_FRAND_SEPs_1-8-13.pdf..

11 For a comparative analysis of the superior efficiency of formal standardisation vis-à-vis *de facto* standardisation, see Drexl, *Standard-Setting Organizations and Processes: Challenges and Opportunities for Competition and Innovation*, Concurrences (forthcoming 2015).

12 Formal standardisation could also be viewed as a winner-takes-all race, since technologies that fail to be included in the standard can be expected to face rapidly declining demand. However it will be shown that market function, SSOs' bylaws, contract law and ultimately competition law constrain the market power of the SEP holder to a significant extent.

the race may expect to enjoy unconstrained market power over the downstream market for standardised consumer products. Moreover the winner is not decided on technical merit, as is typically the case with cooperative standards-setting.[13] Rather, the firm that is prepared to spend the most in coalition-building and attracting consumers will ultimately prevail.[14]

De facto standardisation races can be associated with considerable economic inefficiencies. The supra-competitive profits expected to be enjoyed by the winner induce over-investment in R&D. Insufficient aggregation of information results in inefficient and wasteful duplication of R&D efforts.[15] Most importantly, though, *de facto* standardisation, all its significant costs notwithstanding, still fails to guarantee that the best standard will prevail in the end.[16] Taking into account that the winner's market power raises a significant barrier to future entry, *de facto* standardisation may well result in the industry being locked-in in an inefficient standard for decades.[17]

Formal standardization provides a more efficient alternative model for network markets. Being a *coordinated* and *inclusive* process, formal standardisation has the potential to bring about near-optimal levels of investment in R&D, without the wasteful over-investment of *de facto* standardisation races, and the best technologies to the market, as opposed again to *de facto* standardisation in which the best technical solutions do not necessarily prevail as standards.

---

13 Cabral, *Introduction to Industrial Organization* 315 (MIT Press, 2000).

14 A critical feature of de facto standardisation is the rivals' struggle to achieve the 'critical mass' of consumers that will decide the winning standard through the so-called 'snowball effect'. Once the critical mass is reached, subsequent consumers will opt for the leading technology, even if it was not their preferred one. It thus could be argued that the prevailing standard is not decided by the market as a whole, but rather by the choice of the initial fraction of consumers that forms the 'critical mass'. See Cabral, *supra* n. 13, at 313.

15 The economic literature on patent races could offer important insights on the inefficiencies of standardisation races. Among the many important contributions to the field, see Dasgupta and Stiglitz, *Industrial Structure and the Nature of Innovative Activity*, The Economic Journal 266-293(1980).

16 Cabral, *supra* n. 13, at 325.

17 A good illustration of industry lock-in an inefficient standard is the QWERTY typewriters' keyboard layout. See ibid, at 316-318.

ii. Formal Standardisation and its Superior Efficiency

Cooperative standards-setting, by means of self-regulated coordination and inclusive participation, allows for a *predictable and rewarding structure of returns* to R&D and relatively *low barriers to entry* in both the upstream market for contributed technologies and the downstream market for standard-compliant products. Critical in the proper function of formal standards-setting is providing appropriate incentives for all stakeholders to invest in and commit themselves to the process, otherwise private actors would be unwilling to bear the costs of participation which for some SSOs can be particularly high.[18] This is a delicate balance, one that is foremost dependent on expectations.

One the one side, technology contributors expect a significant revenue stream from licensing their essential IPRs. Cooperative standardisation essentially allows for technologies that are included in standards demand from the whole downstream industry for production of standard-compliant products. The significant licensing revenues flowing from inclusion in the standard induce firms to invest in R&D and to contribute their best available technologies to the standards-setting process.

Strategic considerations provide further incentives for contribution to the process. Inclusion in standards allows contributing firms to influence the course of standardisation, to make full use of their existing R&D capabilities and as a consequence achieve higher efficiency and productivity in their future innovative endeavours. Moreover holding a valuable SEP portfolio gives vertically integrated contributors leverage in their cross-licensing negotiations vis-à-vis their downstream rivals.

One the other side, standard implementers expect significant benefits from formal standardisation as well. Enhanced interoperability and consumer confidence that products will communicate seamlessly with one another, boost growth in network markets. Rapid network growth increases the utility of participation in the network for each individual consumer through direct network effects.[19] Internalisation of network externalities by consumers increases, in turn, demand and consumers' willingness to pay for network consumer goods. Downstream implementers can also rely

---

18 At ETSI for instance participation costs might reach the annual fee of €150,000. See ETSI Fees structure, available at http://www.etsi.org/membership/fees; See also, Layne-Farrar and Padilla, *supra* n.6, at 10.

19 Cabral, *supra* n.13, at 311.

on the formal standardisation in that it promises uninhibited access to the developed standards and reasonable licensing costs that allow for sufficient margin of profit for their investments.

Critical for the proper function of the standards-setting process and a balancing of interests and incentives is the predictability of the rewards and costs associated with licensing of SEPs. FRAND licensing terms have emerged from the market practice of the last few decades as the compromise point between technology contributors and standard implementers. FRAND stands for licensing on *fair, reasonable and non-discriminatory* terms. As abstract as they might appear to be, FRAND terms should be understood as the range of contractual arrangements that allow for a sufficient and predictable monetary reward for contributors so as to incentivise participation in the cooperative standard setting process, whilst at the same time allowing implementers sufficient margin of profit for their investments in the production of standard-compliant products.

The importance of FRAND licensing terms in accommodating the interests of both contributors and implementers is reflected in the bylaws of most SSOs which require declaration and unrestricted licensing of SEPs on FRAND terms. SSOs bylaws and the subsequent FRAND commitment by SEPs-holders, which will be further discussed in the following chapter, indeed infuse the collaborative standard setting process with predictability and reliability, resulting in wide standard adoption, unrestricted market entry and more investment in innovative technologies.

Although the risks from opportunistic behaviour in the standard setting context will be discussed in greater detail below,[20] it is pertinent to stress out at this point that FRAND licensing is a *necessary* condition for the competitive operation of cooperative standards-setting. Behaviour that disturbs the predictability of rewards and costs can critically disrupt the process as a whole.

Licensing outside the FRAND range would significantly interfere with the current balance of incentives for investment in R&D and standard implementation. Below-FRAND licensing would diminish incentives to contribute to the standards-setting process resulting either in under-investment in innovation or in the diversion of investment and R&D effort towards inefficient *de facto* standardisation races. Above-FRAND licensing would reduce investment in standard implementation potentially leading to lower

20 *Infra,* p. 16-17.

output, fewer standard-implementing products and higher prices for consumers. In both cases efficient firms might be forced to leave the market and significant barriers to entry in both upstream and downstream markets would be raised, thus reducing competitive pressures for follow-on innovation, shielding at the same time incumbents from potential competition.

It is for competition policy to assure that network markets remain open and competitive. Conduct that is likely to result in non-FRAND licensing terms can be safely assumed to result in the disruption of the cooperative standards-setting process, anticompetitive foreclosure and significant harm to efficiency and consumer welfare. It is thus a central argument of the present thesis that FRAND licensing of SEPs is an obligation stemming from competition law itself.[21]

Although the FRAND commitment, whether is deemed contractual or declaratory in nature, is an additional and crucial safeguard, stakeholders that are willing to enter into an agreement on FRAND terms should be able to directly rely on competition law against attempts at non-FRAND licensing. As it will be shown in the following chapters, relying too much on the voluntary FRAND commitment might lead some to the potentially pernicious conclusion that holders of IPRs that are contributed and declared essential in an SSO and who have not made such a commitment themselves (for instance when such SEPs are acquired by third parties following inclusion in a standard) are free to pursue onerous, non-FRAND terms.[22]

iii. Anticompetitive Risks Prior-Adoption of a Standard

The standardisation process itself is not without risks, for it is, after all, a form of coordination involving discussions even among horizontal competitors. Formal standardisation could, under certain circumstances, raise barriers to entry and enable stakeholders to exercise control over the standard thereby excluding actual or potential competitors.[23]

The European Commission in its 'Horizontal Guidelines' identified collusion between competitors to raise prices, reduce output and restrict the

21 *Infra*, p. 55-57.
22 *Infra*, p. 52.
23 Jones, *Standard-Essential Patents: FRAND Commitments, Injunctions and the Smartphone Wars*, European Competition Journal 10(1) 4 (2014).

inclusion of innovative technologies as a particular concern when assessing standardisation agreements under Article 101 TFEU.[24] It further stressed out the exclusionary effects of standardisation for technologies that fail to be included in a standard and which subsequently face insurmountable barriers to entry.[25] However, as was already mentioned above, the European Commission, along with other antitrust authorities in other major jurisdictions, views formal standardisation as an ultimately procompetitive process thus providing a safe harbour to SSOs that meet the requirements of transparency and unrestricted accessibility.

Concerns over the transparency of the standard adoption process were largely muted until the very recent change of the IPRs policy of one of the most important SSOs, the Institute of Electrical and Electronics Engineers (IEEE), which is responsible for the development, among others, of the vital and extremely popular 802.11 Wi-Fi standard.[26] The new IEEE policy on SEPs envisages a far stricter framework for seeking injunctive relief, a topic further discussed below, but also a 'specific' framework for calculating FRAND royalty rates.

Although IEEE's new IPR policy received a positive business review letter from the Antitrust Division of the US Department of Justice,[27] the provisions on the calculation of royalties proved particularly controversial. Commentators have criticised the new IEEE policy as a result of monopsonistic collusion.[28] The backlash from some important industry participants was even stronger. Qualcomm, InterDigital, Nokia and Ericsson have already submitted negative letter of assurances, declaring that they will not license their SEPs under the new IEEE IPR policy.[29] Whether the new IEEE policy will eventually have the devaluating impact on royalties

---

24 See, Horizontal Guidelines, *supra* n.7, para.264.

25 Ibid, para.260.

26 See The Institute of Electrical and Electronics Engineers, *IEEE Constitution and Bylaws* (June 2015). Available at https://www.ieee.org/documents/ieee_constitution_and_bylaws.pdf..

27 Business Review Letter from Hon. Renata B. Hesse, Acting Assistant Attorney Gen., U.S. Department of Justice, to Michael A. Lindsay, Esq., Dorsey & Whitney, L.L.P. (February 2, 2015). Available at http://www.justice.gov/sites/default/files/opa/press-releases/attachments/2015/02/02/ieee_business_review_ letter.pdf.

28 See Sidak, *The Antitrust Division's Devaluation of Standard-Essential Patents*, The Georgetown Law Journal Online 104 48 (2015).

29 Richard Lloyd*, Ericsson and Nokia the latest to confirm that they will not license under the new IEEE patent policy* (April 10, 2015). Available at http://www.iam-

and innovation that its critics currently contend remains to be seen, however its impact on the IPR policies of other major SSOs might be of more immediate concern.

B. Theories of Post-Adoption Harm

The recent controversy over the new IEEE policy aside, policy makers and antitrust enforcement agencies have hitherto been mainly concerned over the behaviour of participants to the standards-setting process after the adoption of a standard.

The most influential theory of harm in the context of standards-setting is the 'patent hold-up' theory, developed by Lemley and Shapiro.[30] The mechanism for patent hold-up is relatively straightforward: the downstream product manufacturer, unaware of infringing a patented technology, undertakes a significant investment in building the productive capacity necessary to produce the technology-incorporating product; the initial investment costs are sunk; the owner of the patent asserts his rights; and finally the infringer, in view of the prohibitive switching costs and under the threat of injunction, succumbs to the demands of the patentee who charges exorbitant royalties. According to the hold-up theory, the excessive royalty rate, in such circumstances, bears no relationship with the value of the patented technology itself, but rather reflects the switching costs the infringer would have to incur in order to design around the patent, i.e. the so-called 'hold-up value'.

The danger of patent hold-up is greater in industries with vast numbers of overlapping and fragmented IPRs or, in Shapiro's formulation, 'patent

---

media.com/blog/Detail.aspx?g=d07d0bde-ebd6-495a-aa72-4eecb9dac67d; Richard Lloyd, *InterDigital reveals that, like Qualcomm, it is reworking relationship with IEEE after introduction of new patent policy* (March 24, 2015). Available at http://www.iam-media.com/Blog/Detail.aspx?g=8c9676dd-6bbd-4d6c-b3e5-9a5ddeb36581; Susan Decker and Ian King, *Qualcomm Says It Won't Follow New Wi-Fi Rules on Patents* (February 11, 2015). Available at http://www.bloomberg.com/news/articles/2015-02-11/qualcomm-says-new-wi-fi-standard-rules-unfair-may-not-take-part.

30 Lemley and Shapiro, *Patent Holdup and Royalty Stacking*, Texas Law Review 85 1991 (2007).

thickets'.[31] Patent thickets, in imposing downstream producers onerous obligations to search for and license patented technologies from various patentees, create a significant restraint on the commercialisation of innovation. Although the anticompetitive effects of patent thickets were heavily disputed,[32] Shapiro's formulation provides a valuable insight on the restraints to innovation and its swift commercialisation in markets characterised by fragmented ownership in IPRs.

Closely associated with hold-up and patent thickets, is the issue of royalty stacking. Royalty stacking may arise in conditions of fragmented IPRs ownership in cases where patent owners impose aggregate royalty rates that are prohibitively high for the licensee to operate at a profit.

Although the patent hold-up hypothesis was initially developed outside the standards-setting context, its relevance for analysing opportunistic behaviour after the adoption of a standard became immediately clear. Prior to the adoption of the standard, alternative technologies compete freely for inclusion in the standard. However, once the optimal technical solutions are chosen and the standard is to be implemented such competition ceases.[33] Standard implementers that have failed to license a particular SEP may find themselves facing unreasonable royalty offers or even exclusion from the market by means of injunction.

In such a case, switching to another alternative technology is even more difficult than in the original scenario envisaged by Lemley and Shapiro, for if the asserted patent is truly essential the end product cannot be standard-compliant without a licence. The scope for abuse becomes even clearer if one considers that for many standards, implementers have to license hundreds if not thousands of SEPs. In such circumstances, even a weak patent, which is one of thousands of patents reading on a given product, might under certain circumstances command high royalty rates.[34]

---

31 Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, Innovation Policy And The Economy 1 119 (2001).

32 For instance, it has been argued that patent thickets result in extensive cross-licensing without blocking follow-on innovation. See Cohen, Nelson and Walsh, *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (Or Not),* (NBER, Working Paper No. 7552, Feb. 2000), available at http://www.nber.org/papers/w7552..

33 Farrell, Hayes, Shapiro and Sullivan, *Standard Setting, Patents, and Hold-Up*, Antitrust Law Journal 74 603 (2007).

34 Kattan, *FRAND Wars and Section 2*, Antitrust 27(3) 31 (2013).

However, for the hold-up hypothesis to realise the most fundamental requirement is that the implementer faces a credible threat of injunction. Only in face of exclusion from the market for the standard-compliant goods will the implementer be forced to agree upon whatever terms imposed by the SEP-holder.

Thus the issue of the remedies an SEP holder may pursue in infringement actions and more specifically the conditions under which an injunction for a SEP is warranted is at the core of the current hold-up controversy. One could say, with a certain degree of schematisation, that scholarly literature and public policy polarised between two extremes ending up somewhere in between. On the one hand, several commentators argued that participation in the standards-setting process and in particular the FRAND commitment, which will be examined in detail below, curtail to a significant extent the exclusive rights the SEP-holder would normally enjoy.[35] On the other hand, those that supported that removing injunctions would tilt the bargaining table completely in favour of implementers, leading to under-compensated innovators and reduced incentives to participate in the standards-setting process.[36]

The emerged consensus though distancing from a radical refusal of injunctive relief for SEP-holders in all cases, emphasised the need to limit SEPs holders' exclusive rights to enjoin infringers in cases where the standard implementer is willing to enter into an agreement on FRAND terms.[37] Thus the concept of the 'willing licensee' is the benchmark which typically demarcates the boundaries of the holders' rights to enjoin infringers without jeopardising the credibility and performance of the standards-setting process, in breach of competition law.

The patent hold-up debate in the context of standards-setting has probably been the most passionate debate in competition law for the last decade. Although it is largely couched in theoretical terms and scarce empirical research is available, it has exerted powerful influence on policy makers

35 Chappatte, *FRAND Commitments—The Case for Antitrust Intervention*, European Competition Journal 5 320, 331 (2009); Jones, *supra* n.23, at 24; Lemley and Shapiro, *A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents*, Berkeley Technology Law Journal 28 1144 (2013).

36 For a more detailed review of the criticism against the patent hold-up theory, see *infra* p. 17-19.

37 Kieff and Layne-Farrar, *Incentive Effects from Different Approaches to Holdup Mitigation Surrounding Patent Remedies and Standard-Setting Organizations*, Journal of Competition Law and Economics 9(4) 1108 (2013)..

both in the EU and the US. The following part focuses on regulatory approaches to the hold-up problem.

C. *Responses to Hold-Up – SSOs Self-Regulation and the Voluntary FRAND Commitment*

One could distinguish two levels of safeguards against hold-up at a precautionary level, i.e. before the SEP-holder actually enforces its rights seeking injunctive relief. As a first step, SSOs regulate the behaviour of contributors by imposing certain limitations on their post-adoption behaviour. At a second level public policy makers formulate a framework that provides strong disincentives for anticompetitive behaviour. This includes soft law, such as guidelines, public statements and declarations, but also enforcement action that deters future opportunistic conduct, for instance through merger control. The antitrust authorities' activities will be examined in the following parts of the present thesis. In this part the focus will be on how SSOs regulate the process with view to avoid risks of hold-up.

As mentioned above, SSOs are mechanisms of industry coordination for the development of optimal technical solutions which are implemented industry-wide after the standards are formally adopted. Critical in SSOs' function is to safeguard the predictability of the structure of returns for all stakeholders involved and the reliability of the process as a whole. This is a daunting task; SSOs' membership typically involves participants with diametrically opposite views of the standards-setting process and their aspirations and expectations from the adoption of the standard are no less diverging.

The European Commission in its analysis of standards-setting in its Horizontal Guidelines, has identified three main categories of participants: pure-upstream operators, which do not practice the patents themselves and maximisation of royalties is their main concern;[38] pure-downstream companies which license technology developed upstream and have obviously an incentive to lower royalty rates as much as possible; finally, there is the

38 The upstream group of SSOs members is usually referred to as Non-Practicing-Entities (NPEs), a term which may conceal the actual heterogeneity of this group; indeed a university and a patent-assertion entity (patent troll), although both 'upstream', could hardly be considered institutions with identical incentives.

third group of vertically integrated companies which both license out their own technologies and produce standard-compliant end products.[39] This category has mixed incentives and is holding the bulk of SEPs for all major standards.[40]

The analysis on cooperative standardisation in the previous part already pointed out that SSOs have through the years developed the necessary flexibility to accommodate such widely diverging business models, incentives and objectives.[41] This flexibility is best reflected in SSOs bylaws and regulations. Most SSOs impose commitments with respect to essential IPRs, which without being overly restrictive ensure the widest possible participation and consequently the widest possible adoption of standards.

The two most important obligations that SSOs impose to holders of essential IPRs are *disclosure* of potentially relevant patents and patent applications prior to adoption and the *FRAND commitment*. The disclosure requirement is mainly intended to ensure effective access to implementers that are willing to license SEPs on FRAND terms and to address deceptive conduct before the adoption which may end up in a 'patent ambush'. Though some cases of patent ambush have been pursued by antitrust authorities, it is less frequent a phenomenon.[42]

The FRAND commitment on the other hand intends to allay fears of opportunism, and reassure that licences will not be withheld in the first place. The FRAND commitment stands for fair, reasonable and non-discriminatory terms that the contributor pledges to offer to anyone wishing to implement the standard on FRAND licensing terms. Although a precise definition of FRAND terms is still elusive, the FRAND commitment has a remarkable record of facilitating the diverging interests identified above and has proved a workable framework for the vast majority of the interactions conducted for the purposes of standard implementation.[43]

By imposing FRAND commitments, the SSOs try to ensure that on the one hand contributors are appropriately rewarded for their contributed technologies while, on the other hand, opportunistic private profit-max-

39 See Horizontal Guidelines, *supra* n. 7, para.267.
40 See Bekkers et al., *supra* n. 2, at 27.
41 Epstein, Kieff, and Spulber, *The FTC, IP, and SSOs: Government Hold-Up Replacing Private Coordination*, Journal of Competition Law and Economics 8(1) 22 (2012).
42 Commission Decision, *Rambus* (Case-COMP/38.636)[2010] OJ C30/17.
43 See Epstein, Kieff and Spulber, *supra* n. 41, at 21-22.

imising, at the expense of other participants, implementers and consumers, by holders of SEPs, will not inhibit the success of the developed standards and will neither lead to higher prices or lower output.[44]

The essence of the FRAND commitment is that SEPs holders voluntarily waive some of the exclusive rights bestowed upon them by patent law, in order to maintain effective access to the developed standards on FRAND terms. This voluntary curtailing of exclusive rights does not only entail a limitation of the right to enjoin 'willing licensees' as discussed above, but also limitations on the pricing policy of the SEP-holder, as well as limitations on his exclusive or sole licensing prerogatives.

In respect of the right to injunction, most SSOs so far do not impose an explicit obligation to their members to refrain from seeking, obtaining or enforcing injunctions. However, as already discussed above, IEEE recently amended its bylaws to preclude the seeking and enforcement of injunctions "*unless the implementer fails to participate in, or to comply with the outcome of, an adjudication, including an affirming first-level appellate review*".[45] It should be noted however, that the new IEEE policy envisages a commitment not to pursue injunctions that goes far beyond anything seen so far imposed on SEP-holders either by antitrust authorities or courts, as the analysis in the following parts III and IV will demonstrate.

D. Hold-Up or Hold-Out?

As already mentioned above, the possibility of patent hold-up in the context of cooperative standards-setting was and still is disputed. Criticism is concentrated on the plausibility of hold-up in the first place, but also on the policy implications of a restrictive approach towards the availability of injunctive relief for innovation and the performance of collaborative standardisation.

Several commentators have emphasised the competitive constraints faced by most SEPs-holders in their licensing policies. *Layne-Farrar* and *Padilla* cite the competition from other standards as a constraint to market

44 Ratliff and Rubinfeld, *The Use and Threat of Injunctions in the RAND Context*, Journal of Competition Law and Economics 9(1) 5 (2013).

45 See IEEE-SA Standards Board Bylaws, Art. 6(2), available at http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6..

power of SEPs holders.[46] Another factor curbing market power is the countervailing power of the implementers, especially if they have their own SEPs portfolio. In that case incentives to cross-license are stronger than incentives to engage in opportunistic conduct.[47]

Other commentators rely on the repeat-play nature of the standard setting process, which disciplines unscrupulous SEP-holders and mitigates to a significant extent the danger of hold up.[48] Access to court review of the offered terms and whether they comply with the FRAND commitment might also safeguard against unreasonable and excessive licensing terms.[49]

However, the most convincing argument, from a policy perspective, against imposing an overly restrictive rule against seeking injunctive relief is that, by removing the threat of injunctions for SEPs, the bargaining power of SEPs-holders and implementers would be decisively skewed in favour of the latter thus resulting in 'reverse hold-up' or hold-out.[50] Thus SEPs holders' licensing revenue would be unduly squeezed and consequently the incentives to innovation and participation in the standards-setting process would be impaired.

Insofar as effective protection is provided for by patent law against unwilling potential licensees, the danger of hold-out might not be as urgent as some commentators and stakeholders seem to contend, it is nonetheless a legitimate concern. A sweeping policy against injunctive relief would indeed put bad-faith implementers at an advantage *vis-à-vis* SEPs owners and other standard implementers, an advantage unjustified from a public policy perspective. This might be the reason why the hold-out theory has influenced antitrust authorities in the EU and the US and enforcement ac-

46 See Layne-Farrar and Padilla, *supra* n. 6, at 12-13.

47 Camesasca, Langus, Neven and Treacy, *Injunctions for Standard-Essential Patents: Justice Is Not Blind*, Journal of Competition Law and Economics 9(2) 287 (2013).

48 See Kieff and Farrar, *supra* n. 37, at 1098.

49 Carlton and Shampine*, Identifying Benchmarks for Applying Non-Discrimination in FRAND*, Competition Policy International 8(1) 5 (2014).

50 See Gupta, *supra* n. 1, at 844; Geradin, *The European Commission Policy towards the Licensing of Standard-Essential Patents: Where Do We Stand?*, Journal of Competition Law and Economics 9(4) 1129 (2013); Sidak, *The Meaning of FRAND, Part II: Injunctions*, Journal of Competition Law and Economics 11(1) 7 (2015); see also FTC's Commissioner Wright comments, in ibid, at 32 and accompanying note; Kieff and Farrar, *supra* n. 37, at 1113.

tion has so far targeted cases in which the putative licensee was, in the view of antitrust enforcers, clearly willing to take a licence on FRAND terms.