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Devaluing SEPs: Hold-up bias and side effects of the European Draft Regulation

Abstract: The EU Commission's recent proposal for a regulation on standard essential patents (SEPs) envisages a radical overhaul of the current framework, introducing an essentiality check system, a conciliation process for fair, reasonable and non-discriminatory (FRAND) terms, and a mechanism to determine a reasonable aggregate royalty. However, both the economic justification and the approach endorsed by the proposal are questionable. Indeed, on one hand, there is no evidence of a market failure to justify the initiative and, in addition, the provisions appear to be one-sided, apparently being aimed only at addressing a hold-up problem and pursuing a value-distribution goal from SEP owners to implementers. Accordingly, this paper views the proposal critically, arguing that it departs from the well-established meaning and rationale of FRAND commitments by disregarding hold-out problems, and it jeopardises the suitability of SEPs to serve as valuable financial collateral, thereby endangering future investments in innovation.

Keywords: Standard essential patents; FRAND royalty; hold-up; hold-out; royalty stacking; intangible asset finance; collateral.

JEL Codes: K20, L15, L24, L50, L96, O30

1. Introduction

After almost a decade of communications and studies commissioned on the functioning of standard essential patents (SEPs) licensing markets¹, some months ago the European

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¹ See, e.g., Justus Baron, Pere Arque-Castells, Amandine Leonard, Tim Pohlmann, and Eric Sergheraert, 'Empirical Assessment of Potential Challenges in SEP Licensing', (2023) <https://www.iplytics.com/wp-content/uploads/2023/04/Empirical-Assessment-of-Potential-Challenges-in-SEP-Licensing.pdf>; Group of Experts on Licensing and Valuation of Standard Essential Patents, 'Contribution to the Debate on SEPs' (2021) <https://ec.europa.eu/docsroom/documents/45217>; Rudi Bekkers, Joachim Henkel, Elena M. Tur, Tommy van der Vorst, Menno Driessse, Byeongwoo Kang, Arianna Martinelli, Wim Maas, Bram Nijhof, Emilio Raiteri, and Lisa Teubner, 'Pilot Study for Essentiality Assessment of Standard Essential Patents', (2020) <https://publications.jrc.ec.europa.eu/repository/handle/JRC119894>; European Commission, 'Making the most of the EU's innovative potential. An intellectual property action plan to support the EU's recovery and resilience', COM(2020) 760 final; European Commission, 'Setting out the EU approach to Standard Essential Patents', COM(2017) 712 final; IPlytics, 'Landscaping study on Standard Essential Patents (SEPs)', (2017) https://www.iplytics.com/wp-content/uploads/2017/04/Pohlmann_IPlytics_2017_EU-report_landscaping-SEPs.pdf; European Commission, 'ICT Standardisation Priorities for the Digital Single Market', COM(2016) 176 final; Charles River Associates, 'Transparency, Predictability, and Efficiency of SSO-based Standardization and SEP Licensing', (2016) <https://ec.europa.eu/docsroom/documents/48794>.

Commission decided to intervene, delivering a proposal for a regulation (Draft Regulation).² The Commission's wish list is ambitious, as the initiative aims to address the lack of transparency with regard to SEPs, fair, reasonable and non-discriminatory (FRAND) terms and conditions, licensing in the value chain, and the limited use of dispute resolution procedures for resolving disagreements.³ These are considered to be the causes of an inefficient SEP licensing ecosystem, which is likely to become even more problematic due to the emergence of the Internet of Things (IoT), as new players with few resources and little licensing experience (i.e. start-ups and SMEs) are entering the market for connectivity.⁴

As a result, the Commission is not intending to maintain the system as it stands but is instead envisaging its overhaul by introducing an essentiality check system, a conciliation process for the FRAND determination, and a mechanism to determine a reasonable aggregate royalty.

However, the proposal has been met with much criticism, firstly questioning the existence of any problem to be solved and then warning against the approach adopted, which was thought to be imbalanced. Indeed, from this perspective, empirical evidence does not justify the intervention, as there is no proof of any market failure that needs to be fixed. Furthermore, the main provisions appear to be one-sided, implying that there is a need to redistribute value from SEP owners to implementers, and thus to address a hold-up problem.

Against this background, this paper investigates whether the Draft Regulation may devalue European SEPs, thus reducing the incentives for patent owners to invest in research and development (R&D). Notably, the paper suggests that, irrespective of the hold-out problems and the imposition of costs and restrictions on patent holders alone, the Commission's proposal departs from the well-established meaning of FRAND commitments and ultimately threatens the financial value of SEPs.

The paper is structured as follows. Section 2 provides an overview of the main pillars of the Draft Regulation. Section 3 analyses the side effects of the provisions on essentiality checks, FRAND determination, and aggregate royalties, maintaining that the proposal entirely disregards the perspective of SEP owners in relation to hold-out risks. Section 4 investigates the relationship between patents and finance, illustrating the potential impact of the Draft Regulation on the financial value of SEPs as collateral and, in turn, its implications on innovation incentives. Section 5 concludes.

² European Commission, Proposal for a Regulation of the European Parliament and of the Council on Standard Essential Patents and Amending Regulation (EU) 2017/1001, COM(2023)232.

³ Ibid., Recital 2.

⁴ European Commission, 'Intellectual property – new framework for standard-essential patents', (2022) Call for evidence for an impact assessment, https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13109-Intellectual-property-new-framework-for-standard-essential-patents_en.

2. Brief overview of the Draft Regulation: Essentiality checks, FRAND determination, and reasonable aggregate royalties

By introducing provisions that, albeit not binding, would establish an essentiality check system, a FRAND determination procedure, and a mechanism for determining reasonable aggregate royalties for a standard, the Draft Regulation would overhaul the entire SEP licensing system, affecting the core of governance of Standard Developing Organisations (SDOs), namely both disclosure and licensing rules usually adopted to ensure that the process functions efficiently and to reduce the risks of opportunistic behaviours by participants.

Indeed, by requiring firms taking part in a standardisation initiative to disclose the existence of any intellectual property right that might cover a technology considered to be implemented into the standard, SDOs aim to reduce the risk of any investment in the preparation, adoption, and application of standards being wasted as a result of the unavailability of a patent that is essential for a standard.⁵ In this regard, disclosure rules may play a significant role in alleviating risks of under- and over-declaration of patents that might be essential for practising an industry standard. The former may result in patent ambush, namely the non-disclosure of patents or patent applications that become essential to the adopted standard, perhaps enabling a patent holder to avoid a FRAND commitment and demand supra-FRAND royalties to license its patents. For these reasons, by failing to disclose SEPs, patent holders could be open to antitrust liability.⁶ Over-disclosure may, on the other hand, originate from the possible benefit for patent holders in inflating the numbers of their patents disclosed as being potentially essential to a standard. In this regard, as some studies suggest that many patents disclosed as essential are not actually essential⁷, the request for a reform stems from the argument that SDOs are not under any obligation to perform any essentiality check.⁸

Furthermore, according to SDO licensing rules, SEP holders are required to license their patents implemented into the standard on FRAND terms. Notwithstanding the time spent by courts, policy makers, and academics, the economic and legal meanings of the FRAND commitment are still controversial. While it has been suggested that this commitment is mainly designed to avoid hold-up risks, thus preventing SEP owners from demanding excessively high royalties when implementers are locked-in to a standard, courts have also (correctly) interpreted it as a tool for addressing reverse hold-up (or hold-out)

⁵ See, e.g., ETSI, 'Intellectual Property Rights Policy', (2022) §1.1, <https://www.etsi.org/images/files/ipr/etsi-guide-on-ipr.pdf>.

⁶ See, e.g., European Commission, 9 December 2009, Case COMP/38636, *Rambus*; U.S. Federal Trade Commission, *In the Matter of Rambus*, File no. 011-0017 (2002); U.S. Federal Trade Commission, *In the Matter of Dell Computer*, File No. 931-0097 (1996).

⁷ See, e.g., Rudi Bekkers, Christian Catalini, Arianna Martinelli, Cesare Righi, and Timothy Simcoe, 'Disclosure rules and declared essential patents', (2023) 52 *Research Policy* 104618; Robin Stitzing, Pekka Sääskilähti, Jimmy Royer, and Marc Van Audenrode, 'Over-Declaration of Standard Essential Patents and the Determinants of Essentiality', (2018) <https://ssrn.com/abstract=2951617>; IPlytics (n 1) Charles River Associates (n 1); Josh Lerner and Jean Tirole, 'Standard-Essential Patents', (2015) 123 *Journal of Political Economy* 547.

⁸ Mark A. Lemley and Timothy Simcoe, 'How Essential are Standard-Essential Patents?', (2019) 104 *Cornell Law Review* 607, 610.

problems by preventing licensees from engaging in strategic practices to evade the payment of royalties or to depress prices. Indeed, in an attempt to tackle both hold-up and hold-out opportunistic behaviour and to strike a fair balance between the different interests involved, in the landmark ruling *Huawei v. ZTE* the European Court of Justice (CJEU) developed the so-called willing licensee test, stating that the exercise of remedies to protect intellectual property rights may be considered unlawful for the purposes of competition law only in exceptional circumstances, and subordinated any limitation of injunctions to the demonstration of the licensee's willingness to sign a FRAND deal.⁹

Against this background and with the goal of enhancing the transparency, predictability, and efficiency of SEP licensing, the Draft Regulation envisages an intrusive intervention, entrusting to a competence centre established under the purview of the European Union Intellectual Property Office (EUIPO) the main tasks regarding SEP licensing and litigation.

Firstly, in order to conduct essentiality checks, the competence centre would create and manage a register in which SEP owners seeking to license their SEPs in the EU must specify which patents they consider to be essential to a particular standard.¹⁰ The registration is mandatory for enforcement purposes: if an SEP is not registered, the owner would not be able to assert it in court and would not be able to collect royalties or pre-existing damages for any use of the SEP prior to the registration date. Essentiality checks would be conducted randomly by independent evaluators on a sample from SEP portfolios, based on a methodology to be developed by the Commission so as to ensure that the sample is capable of producing statistically valid results.¹¹ Only one SEP from the same patent family would be checked. SEP owners may designate up to 100 registered SEPs for essentiality checks and may submit a claim chart for each SEP that is checked, including for the peer evaluation process. The results of the essentiality checks are not legally binding; therefore, any disputes in relation to essentiality would have to be decided by the courts.

Furthermore, in order to speed up negotiations concerning FRAND terms and to reduce costs, the Draft Regulation introduces a mandatory conciliation process, which is also a precondition for accessing the competent court of the Member States.¹² The obligation to initiate FRAND determination is without prejudice to the possibility for either party to ask the competent court of a Member State, pending the FRAND determination, to issue a provisional injunction of financial nature against the alleged infringer. However, the provisional injunction would exclude the seizure of the property of the alleged infringer and the seizure or delivery up of the products suspected of infringing an SEP.

Although it would be mandatory to start the conciliation before bringing a court action, the parties would be free to decide on their own level of engagement and would not be

⁹ CJEU, 16 July 2015, Case C-170/13, *Huawei Technologies Co Ltd v. ZTE Corp*, ECLI:EU:C:2015:477.

¹⁰ Draft Regulation (n 2) Articles 19-25. The European Commission has been inspired by the Japanese *hantei* system, which represents the only attempt so far at introducing an essentiality review of SEPs by a patent office: see Japan Patent Office, 'Manual of Hantei for Essentiality Check' (2018) https://www.jpo.go.jp/e/system/trial_appeal/hantei_hyojun.html. However, because of stringent admission criteria and a narrowly defined test, this procedure has not yet been invoked by market parties. The *hantei* system has been recently revised to tackle some of these limits.

¹¹ Draft Regulation (n 2) Articles 28-33.

¹² *Ibid.*, Article 34.

prevented from leaving the process at any time. The FRAND determination could even take place with the participation of just one party. The process would be completed within nine months and, upon its conclusion, the conciliator would make a proposal recommending a FRAND rate.¹³ If the parties do not settle and/or do not accept that proposal, the conciliator would draft a report of the FRAND determination, including a confidential and a non-confidential version. The latter would contain the proposal for FRAND terms and conditions and the methodology used and would be provided to the competence centre for publication in order to inform any subsequent FRAND determination between the parties and other stakeholders involved in similar negotiations.

Moreover, to facilitate SEP licensing further and to reduce its cost, the Draft Regulation includes the determination of aggregate royalties for SEPs covering a standard, enabling holders of FRAND-encumbered SEPs to agree jointly upon it and notify the competence centre.¹⁴ If there is no agreement between the SEP holders, those representing at least 20% of all SEPs of a standard may ask the competence centre to appoint a conciliator to mediate discussions for the joint submission of an aggregate royalty. In this case, the conciliator's role would be to facilitate the decision-making by the participating SEP holders without making any recommendation of an aggregate royalty. However, SEP holders and/or implementers would also be able to ask the competence centre for a non-binding expert opinion on a global aggregate royalty. The opinion would contain a non-confidential analysis of the expected impact of the aggregate royalty on SEP holders and stakeholders in the value chain.

The provisions concerning the aggregate royalty aim to address the risk of royalty stacking, which is a phenomenon related to hold-up. Essentially, it means that even if the royalty rates, taken separately, are fair and reasonable, when large numbers of patents are involved, this may result in supra-competitive total rates due to double marginalisation.¹⁵ Notably, the total royalty burden on a standardised product can become so high that the overall price paid exceeds the value of the corresponding contributions, with the aggregate royalties obtained for the various features of a product outweighing the value of the product itself.¹⁶

Both the aggregate royalty determination and the compulsory FRAND determination prior to litigation would be not required for SEPs covering those cases of the use of standards for which the Commission establishes, by means of a delegated act, that there is sufficient evidence that SEP licensing negotiations on FRAND terms do not give rise to significant difficulties or inefficiencies.¹⁷

¹³ Ibid., Articles 37 and 50-58.

¹⁴ Ibid., Articles 15-18.

¹⁵ Mark A. Lemley and Carl Shapiro, 'Patent holdup and royalty stacking', (2006) 85 Texas Law Review 1991. See also *Ericsson, Inc. v. D-Link Systems, Inc.*, 773 F.3d 1201, 1209 (Fed. Cir. 2014), arguing that, when a standard implicates numerous patents, "[i]f companies are forced to pay royalties to all SEP holders, the royalties will 'stack' on top of each other and may become excessive in the aggregate."

¹⁶ Draft Regulation (n 2) Recital 15, contending that knowledge of the potential total royalty for all SEPs covering a standard applicable to the implementations of that standard is important for the assessment of the royalty amount for a product, which plays a significant role for the manufacturer's cost determinations, and it also helps SEP holder to plan expected return on investment.

¹⁷ Ibid., Article 1(3-4).

3. Biases versus empirical evidence: the (absent) economic justification of the Draft Regulation

Each of the illustrated regulatory proposals has been harshly criticised for being detached from reality and unsupported by empirical evidence and economic justification.

With regard to essentiality checks, some scholars have questioned the results of essential patent landscaping studies, raising doubts about their accuracy and reliability, such as with regard to the actual number of non-essential patents disclosed.¹⁸ Furthermore, some over-declaration is - to a certain extent - inevitable as it reflects the natural process of standard development.¹⁹ Moreover, it has been argued that the challenge for policy makers is to select an efficient and effective essentiality test mechanism as, due to the number of technical specifications and patents involved, essentiality checks are a costly and time-consuming activity; the accuracy of the different potential methods is also strongly debated.²⁰ As a result, while it is uncertain whether the EU solution could enhance the *status quo*, essentiality checks may provide implementers with a strategic opportunity for hold-out by delaying or even avoiding royalty payments.²¹ Concerns that some implementers may misuse such a process in an attempt to delay negotiations or to avoid paying royalties are further exacerbated by the fact that, under the Draft Regulation, the results of the essentiality checks would be not legally binding and any disputes in relation to them would need to be decided by the courts.²²

Similar concerns have been raised about the pre-trial mandatory FRAND determination. Indeed, by endorsing an anti-injunction approach, the Draft Regulation marks a

¹⁸ See Keith Mallinson, 'Essentiality checks might foster SEP licensing, but they won't stop over-declarations from inflating patent counts and making them unreliable measures', (2022) <https://ssrn.com/abstract=4278639>; Igor Nikolic, 'Estimating 5G Patent Leadership: The Importance of Credible Reports', (2022) <https://ssrn.com/abstract=4109222>; Haris Tsilikas, 'Patent Landscaping Studies and Essentiality Checks: Rigorous (and Less Rigorous) Approaches', (2022) 53 *les Nouvelles*.

¹⁹ See *Unwired Planet v. Huawei Technologies*, [2020] UKSC 37, para. 44, arguing that "problem of over-declaration is in part the result of the IPR Policy process which requires patent owners to declare SEPs in a timely manner when a standard is being prepared, as it encourages patent owners to err on the safe side by making a declaration. In part, there are difficulties in interpreting both the patents and the standards. In part also, patent claims are amended over time; different national patents within a patent family will vary in scope around the world; and standards themselves will vary over time." See also Bekkers, Henkel, Tur, van der Vorst, Driesse, Kang, Martinelli, Maas, Nijhof, Raiteri, and Teubner (n 1) 112, noting that actual essentiality can only be determined once the standard's document in question is final and once the patent in question is granted. Therefore, because disclosures are typically made before these processes are concluded, some inaccuracies in the disclosure process are inevitable even if companies act in good faith.

²⁰ See Giuseppe Colangelo, 'Finding an efficiency-oriented approach to scrutinize the essentiality of SEPs: a survey', (2023) 18 *Journal of Intellectual Property Law and Practice* 502, providing a review of the literature on different mechanisms that have been proposed to determine the essentiality of a patent. For an estimation of the cost of essentiality checks, see Bekkers, Henkel, Tur, van der Vorst, Driesse, Kang, Martinelli, Maas, Nijhof, Raiteri, and Teubner (n 1); *IPlytics* (n 1) 51-52; *Charles River Associates* (n 1) 58-59.

²¹ *Charles River Associates* (n 1) 32.

²² See Cody M. Akins, 'Overdeclaration of Standard-Essential Patents', (2020) 98 *Texas Law Review* 579, suggesting introducing a presumption of infringement by standard-compliant products once patents are deemed essential by the patent office in order to make these procedures more effective. See also Group of Experts on Licensing and Valuation of Standard Essential Patents (n 1) 68, advocating the adoption of measures to prevent the challenging of independent essentiality confirmations for all or a substantial number of SEPs of one SEP holder as part of licensing negotiations and delay tactics.

significant departure from the bargaining framework developed by the CJEU in *Huawei*.²³ While the CJEU's willing licensee test aims to strike a fair balance between the different interests involved, compulsory conciliation would determine an uneven bargaining position between licensors and licence seekers by reducing the scope of injunctions beyond *Huawei*. Implementers would be free to challenge SEPs requesting determinations of invalidity, and declarations of non-infringement and non-essentiality, but patent owners would be restricted from bringing an infringement suit prior to initiating a FRAND determination, regardless of the implementers' willingness.²⁴ Therefore, rather than being focused on tackling both hold-up and hold-out opportunistic behaviour, the Commission appears to be concerned solely with the former. Furthermore, as the FRAND determination under the Draft Regulation and the *Huawei* bargaining framework are intended to coexist²⁵, the European proposal is likely to cause confusion, thus leading to licensing disputes, rather than supporting balanced and successful SEP licensing negotiations.²⁶

Finally, the proposed mechanism for determining reasonable aggregate royalties has been questioned due to the lack of empirical evidence to support the royalty stacking theory.²⁷ Furthermore, it has been highlighted that antitrust risks may arise from the participation of implementers in the process of providing an expert opinion on global aggregate rates, as they may exploit such an opportunity to coordinate their submissions with the aim of devaluing FRAND royalty rates.²⁸

By and large, the main criticism made against the Draft Regulation concerns its economic justification, notably the fact that there is no discernible evidence of a market failure that needs to be addressed.²⁹ Indeed, the empirical evidence informing the Commission's

²³ Giuseppe Colangelo, 'FRAND determination under the European SEP Regulation Proposal: discarding the *Huawei* framework?', (forthcoming) ICLE Research Paper.

²⁴ Draft Regulation (n 2) Article 56(4), stating that the enforcement before a national court is also precluded when the determination of FRAND terms and conditions is raised in abuse of dominance cases, namely in the national application of the *Huawei* framework.

²⁵ See European Commission, 'Impact Assessment Report Accompanying the Document Proposal for a Regulation of the European Parliament and of the Council on Standard Essential Patents and Amending Regulation (EU) 2017/1001', SWD(2023) 124 final, 43 and 58, arguing that the mandatory conciliation will complement the *Huawei* process.

²⁶ Colangelo (n 23).

²⁷ For a summary of the empirical evidence on royalty stacking, see Justus A. Baron, 'The Commission's Draft SEP Regulation – Focus on Proposed Mechanisms for the Determination of "Reasonable Aggregate Royalties"', (2023) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4537591, arguing that aggregate royalty burdens on implementers are well below the levels predicted by such a theory, thus encouraging EU institutions to delete Articles 15-18 of the Draft Regulation.

²⁸ Igor Nikolic, 'Some practical and competition concerns with the proposed Regulation on Standard Essential Patents', (2023) <https://www.4ipcouncil.com/research/some-practical-and-competition-concerns-proposed-regulation-standard-essential-patents>.

²⁹ See, e.g., Centre for a Digital Society of the European University Institute, 'Feedback to EU Commission's public consultation', (2023) https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13109-Intellectual-property-new-framework-for-standard-essential-patents/F3432699_en; Christine A. Varney, Makan Delrahim, David J. Kappos, Andrei Iancu, Walter G Copan, and Noah Joshua Phillips, 'Comments on European Commission's Draft "Proposal for Regulation of the European Parliament and of the Council Establishing a Framework for Transparent Licensing of Standard Essential Patents"', (2023) <https://ipwatchdog.com/wp-content/uploads/2023/04/Comments-on-European-Commission-Draft-SEP-Regulation-by-Former-US-Officials-1.pdf>; Robin Jacob and Igor Nikolic, 'ICLE

initiative reveals that there is no SEP litigation failure in Europe.³⁰ According to the study used as the main input for the Commission's Impact Assessment, existing empirical evidence on the causal effects of current SEP licensing conditions is "largely inconclusive".³¹ In particular, there is no evidence that FRAND licensing frictions are causing SEP owners to contribute less to standard development or are inducing implementers to opt for alternative standards (i.e. without FRAND licensing); there is also no indication that current SEP licensing conditions systematically suppress or delay standard implementation.³² For these reasons, the European regulatory intervention appears unnecessary.

In addition, the Draft Regulation seems to be imbalanced and one-sided, essentially being driven by a hold-up bias. Although it is a well-established principle, acknowledged by the courts³³ and the European Commission³⁴, that hold-up and hold-out are two sides of the same coin - and thus that FRAND pledges are intended to address both of these opportunistic behaviours at the same time - the hold-out problem is completely disregarded by the Draft Regulation.³⁵

Indeed, the EU proposal completely ignores the perspective of SEP owners. As reported by the Impact Assessment, in order to participate in standard creation, prospective SEP holders have to invest considerable time and resources in R&D activities firstly to develop new technology and then to patent it worldwide³⁶: "All that is done without guarantee

Feedback to EU Commission's public consultation', (2023) https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13109-Intellectual-property-new-framework-for-standard-essential-patents/F3433917_en.

³⁰ Baron, Arque-Castells, Leonard, Pohlmann, and Sergheraert (n 1).

³¹ Ibid., 185.

³² Ibid., 164.

³³ See, e.g., *Huawei* (n 9) paras. 65-67; *Unwired Planet* (n 19) paras. 10, 61 and 167.

³⁴ See European Commission (n 4) 2, stating that the inefficient SEP licensing that the Draft Regulation aims at addressing includes hold-up and hold-out; European Commission, 'Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements', (2023) OJ C 259/1, para. 444.

³⁵ In the literature, on the relevance of hold-out, see, e.g., Bowman Heiden and Justus Baron, 'The Economic Impact of Patent Holdout', (2023) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4505268; Gerard Llobet and Jorge Padilla, 'A theory of socially inefficient patent holdout', (2023) 32 *Journal of Economics & Management Strategy* 424; Richard A. Epstein and Kayvan B. Noroozi, 'Why incentives for "patent holdout" threaten to dismantle FRAND and why it matters', (2018) 32 *Berkeley Technology Law Journal* 1381; Bowman Heiden and Nicolas Petit, 'Patent "trespass" and the royalty gap: Exploring the nature and impact of patent holdout', (2018) 34 *Santa Clara High Technology Law Journal* 179. Conversely, see Carl Shapiro and Mark A. Lemley, 'The Role of Antitrust in Preventing Patent Holdup', (2020) 168 *University of Pennsylvania Law Review* 2019, 2047, finding that patent hold-out is "incoherent as a theoretical matter and rejected as an empirical matter"; Brian J. Love and Christian Helmers, 'Patent Hold-out and Licensing Frictions: Evidence from Litigation of Standard Essential Patents', (2023) 89 *International Journal of Industrial Organization* 102978; and Thomas F. Cotter, Erik Hovenkamp, and Norman Siebrasse, 'Demystifying Patent Holdup', (2019) 76 *Washington and Lee Law Review* 1501.

³⁶ Impact Assessment (n 25) 11-15, mentioning Raphaël De Coninck, Christoph von Muellern, Samuel Zimmermann, and Kilian Mueller, 'SEP Royalties, Investment Incentives and Total Welfare', (2022) <https://fair-standards.org/wp-content/uploads/2023/04/SEP-Royalties-Investment-Incentives-and-Total-Welfare.pdf>, which estimate R&D amounts of between USD 2 and 9 billion annually for standards used in a smartphone.

that first, the inventor's patents will be used by the standard, and second, that the standard will be accepted by the market."³⁷ Given that, even if a standard is accepted, it takes time before it is widely used, while an invention is protected for a limited amount of years, SEP holders have limited time to generate a return for their R&D investments through royalties for the use of their patents.³⁸ Furthermore, in contrast to other patents, SEP holders are bound by the FRAND commitment. Therefore, in the public consultation, SEP owners stated that their main challenges included facing lengthy negotiations and the high cost of licensing due to the various means used by implementers to delay the obtaining of a licence.³⁹

Against this backdrop, the Draft Regulation disregards the problems raised by SEP owners in the public consultation and highlighted by the Impact Assessment. Furthermore, the costs of such a regulation would be borne by the SEP holders alone, whereas the implementers would reap all the benefits. This emerges clearly from the comparison between the expected costs and benefits envisaged by the Impact Assessment.⁴⁰ While it imposes costs and restrictions on patent holders, the Draft Regulation gives implementers a free-ride, allowing them to undertake delaying tactics and to pursue efficient infringements. As a result, the Draft Regulation is apparently motivated by the aim of redistributing value from SEP owners to implementers.⁴¹ Moreover, given that, according to the findings of the Impact Assessment, less than 10% of implementers are based in Europe, the Draft Regulation would have the effect of subsidising non-EU implementers.⁴²

The immediate effect of such an approach would be to devalue European SEPs, endangering future investments in innovation. The consequences of a potential devaluation of SEPs should be particularly worrisome for EU policy makers as the landscape illustrated in the Impact Assessment reveals that, while one-third of all SEPs are owned by Chinese companies, which have doubled their share in seven years, EU shares in SEPs have decreased from 22% to 15% in the same period.⁴³

In brief, the Draft Regulation is not only providing solutions for a problem that does not exist, as there is no evidence of market failure, but it is also pursuing an unjustified goal of value redistribution by embracing a hold-up bias that is at odds with the rationale of FRAND commitments and threatens the financial value of SEPs.

³⁷ Impact Assessment (n 25) 12.

³⁸ *Ibid.*, reporting that, in order to be able to better assess the value that their technology brings to the standard implementations, a SEP holder would wait around 2 to 4 years until the standard is implemented in the market and then approach companies in specific markets to offer them licences. This is followed by negotiations, which take on average 3 years and potentially litigation in case parties cannot reach an agreement (adding another 1 to 2.5 years).

³⁹ *Ibid.*, 13-14.

⁴⁰ *Ibid.*, 58.

⁴¹ Jacob and Nikolic (n 29).

⁴² *Ibid.*

⁴³ Impact Assessment (n 25) 8.

4. Patents and finance

As patents are central to corporate financing and innovation, it is crucial to assess the potential impact of the Draft Regulation on a significant aspect of SEPs, namely their role as financial collateral, which is both promising and sensitive from a regulatory perspective.

Financial intermediaries typically require collateral to mitigate information imbalances and moral hazard risks, since borrowers with lower credit ratings may be less inclined to pledge assets as a means of demonstrating their creditworthiness.⁴⁴ Admittedly, intangible assets pose unique challenges when seeking external financing. Indeed, the valuation of intangibles is more volatile than that of tangible assets, and asset transferability might not be optimal due to several sector-specific areas of friction.⁴⁵ Consequently, intangible assets are more challenging to redeploy and hold a lower liquidation value, limiting any recovery for creditors in the event of default.

When focusing on the case of patents, it is imperative to gain some insight into access by companies to bank debt financing and the degree to which regulatory obstacles can hinder their ability to pledge patents as collateral. Banks have been playing a significant role in funding innovative ventures, ultimately shaping corporate innovation policies.⁴⁶ Therefore, the use of patent portfolios as collateral within financing strategies is progressively gaining prominence for both market participants and policymakers.⁴⁷

For instance, numerous countries have initiated policies to facilitate patent-backed loans for innovative firms. In the US, private investment banks, unbridled by the strict prudential regulations to which commercial banks must adhere, have driven the growth of IP-backed financing. These loans secured by intangible assets rose from 11% to 24% between 1997 and 2005.⁴⁸ France has implemented a legal framework that offers lenders

⁴⁴ Hans Degryse, Artashes Karapetyan, and Sudipto Karmakar, 'To ask or not to ask? Bank capital requirements and loan collateralization', (2021) 142 *Journal of Financial Economics* 239-260.

⁴⁵ Guido Franco and Lilas Demmou, 'Mind the Financing Gap: Enhancing the Contribution of Intangible Assets to Productivity', (2021) OECD Economics Department Working Papers No. 1681, https://www.oecd-ilibrary.org/economics/mind-the-financing-gap-enhancing-the-contribution-of-intangible-assets-to-productivity_7aefd0d9-en.

⁴⁶ See, e.g., Anna Geddes and Tobias S. Schmidt, 'Integrating finance into the multi-level perspective: Technology niche finance regime interactions and financial policy interventions', (2020) 49 *Research Policy* 103985; Ramana Nanda and William Kerr, 'Financing innovation', (2015) 7 *Annual Review of Financial Economics* 445; Shane A. Johnson, 'An empirical analysis of the determinants of corporate debt ownership structure', (1997) 32 *Journal of Financial and Quantitative Analysis* 47; Joel Houston and Christopher James, 'Bank information monopolies and the mix of private and public debt claims', (1996) 51 *Journal of Finance* 1863.

⁴⁷ See, e.g., the World Intellectual Property Organization (WIPO) launching in 2022 a High-level Conversation on Unlocking Intangible Asset Finance, https://www.wipo.int/sme/en/news/2022/news_0018.html; and OECD, 'Bridging the gap in the financing of intangibles to support productivity: Background paper', (2021) OECD Publishing, Paris, <https://www.oecd.org/global-forum-productivity/events/Bridging-the-gap-in-the-financing-of-intangibles-to-support-productivity-background-paper.pdf>.

⁴⁸ Maria Loumioti, 'The Use of Intangible Assets as Loan Collateral', (2012) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1748675.

a high level of legal certainty; this framework grants lenders the right to acquire non-possessory interests in the intellectual property assets of debtors and hinges on a centralised registry for various IP assets.⁴⁹ In addition, Bpifrance, a French public sector investment bank, offers uncollateralised loans to SMEs for digitalisation, while Germany's Bavaria Digital initiative provides favourable loans to digital SMEs with streamlined applications.⁵⁰ In China, the active market for IP-backed financing relies on massive government support, involving, in particular, the State Intellectual Property Office (SIPO) and the Ministry of Finance.⁵¹ South Korea's Development Bank plays a key role through its Techno Banking initiative, including IP purchase loans and support for distressed IPs.⁵² Singapore's IP Financing Scheme, established in 2014, certifies patent values and shares risk with lender banks, partially underwritten by the Government.⁵³

Given such an increasing policy interest in IP finance, the issue of patent pledgeability must be carefully considered when developing adjacent regulation constraining SEP holders. After reviewing the literature on patents as financial collateral, this section highlights the distinctive characteristics that make SEPs particularly appealing from a financial perspective and also as tools to incentivise innovation.

4.1 Literature review

The practice of using patents as financial collateral has evolved over time, driven by the imperative need for capital access and risk mitigation. A substantial body of economic literature addressing this issue has been developed over the last decade.

Amable et al., as well as Grilli et al., theorised the suitability of patents as collateral by contemplating the potential implications of a widespread increase in patent use and the

⁴⁹ Laurie Ciaramella, David Heller, and Leo Leitzinger, 'Intellectual Property as Loan Collateral' (2022) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4260877; Michel Sejean and Nicolas Binctin, 'Security rights in intellectual property in France', in *Security Rights in Intellectual Property* (ed. E.-M. Kieninger), Springer, 2020, 373.

⁵⁰ Bpifrance, 'The Digital Transformation Of French Companies With The France Num Guarantee', (2022) Press Release, <https://www.bpifrance.com/2022/04/20/bpifrance-supports-the-digital-transformation-of-french-companies-with-the-france-num-guarantee/>. See also Bavarian Ministry of Economic Affairs, 'Funding and financing options for investors', (2023) https://cms.invest-in-bavaria.com/fileadmin/media/documents/Flyer_broschures/210527_RZ_IIB_Foerdermittelbroschuere_EN_G_2021_Web-PDF_1_.pdf.

⁵¹ Martin Brassell and Kris Boschmans, 'Fostering the Use of Intangibles to Strengthen SME Access to Finance', (2019) OECD SME and Entrepreneurship Papers No. 12, <https://www.oecd-ilibrary.org/deliver/729bf864-en.pdf?itemId=%2Fcontent%2Fpaper%2F729bf864-en&mimeType=pdf>.

⁵² Franco and Demmou (n 45), 35.

⁵³ Asia-Pacific Economic Cooperation, 'Best Practices on Intellectual Property (IP) Valuation and Financing in APEC', (2018) Report by the Committee on Trade and Investment (CTI), Intellectual Property Rights Experts Group, <https://www.apec.org/publications/2018/04/best-practices-on-ip-valuation-and-financing-in-apec>.

leverage effect that this collateral could have on innovation-driven growth.⁵⁴ Loumioti found evidence that loans secured by intangibles perform no worse than other secured loans.⁵⁵ Mann and Hochberg et al. reported that patents are often used as collateral and that innovative firms obtain loans more frequently.⁵⁶ On a similar note, Brassell and King provided evidence that innovative firms use cash flow streams deriving from licensing or royalties to secure loans.⁵⁷ Furthermore, as demonstrated by Francis et al., patents function as a signalling mechanism for small and nascent enterprises, showcasing the calibre of the firm's management and its technological acumen, thereby enjoying fewer collateral requirements and lower bank loan spreads.⁵⁸ On a related note, Robb and Robinson provided causal evidence to suggest that a substantial source for start-up capital stems from bank financing.⁵⁹

Farre-Mensa et al. consolidated the argument by documenting that, due to randomly assigned lenient patent examiners, small firms which obtain patent protection are set to benefit beyond the value of the technical solution itself in terms of increased post-patent funding.⁶⁰ Similarly, Chava et al. demonstrated that cheaper loans result from an exogenous enhancement in the value of borrowers' patents, either through creditor rights over collateral or greater patent protection.⁶¹ Plumlee et al. found that borrowers with forthcoming patents are charged a lower spread by banks.⁶² Dai et al. found that increased patent pledgeability encourages corporations to shift from secrecy-based innovation to patent-based innovation, rather than solely alleviating financial constraints.⁶³ This evidence aligns with the perception of patents as viable collateral and indicators of technological achievement, thereby enhancing future profitability prospects.

⁵⁴ Bruno Amable, Jean-Bernard Chatelain, and Kirsten Ralf, 'Patents as collateral', (2010) 34 *Journal of Economic Dynamics & Control* 1092; Luca Grilli, Marianna Mazzucato, Michele Meoli, and Giuseppe Scellato, 'Sowing the seeds of the future: Policies for financing tomorrow's innovations', (2018) 127 *Technological Forecasting and Social Change* 1.

⁵⁵ Loumioti (n 48).

⁵⁶ William Mann, 'Creditor rights and innovation: Evidence from patent collateral', (2018) 130 *Journal of Financial Economics* 25; Yael V. Hochberg, Carlos J. Serrano, and Rosemarie H. Ziedonis, 'Patent collateral, investor commitment, and the market for venture lending', (2018) 130 *Journal of Financial Economics* 74.

⁵⁷ Martin Brassell and Kelvin King, 'Banking on IP?: The Role of Intellectual Property and Intangible Assets in Facilitating Business Finance' (2013) *The Intellectual Property Office of the United Kingdom*.

⁵⁸ Bill Francis, Iftexhar Hasan, Ying Huang, and Zenu Sharma, 'Do Banks Value Innovation? Evidence from US Firms', (2021) 41 *Financial Management* 159.

⁵⁹ Alicia M. Robb and David Robinson, 'The capital structure decisions of new firms', (2014) 27 *Review of Financial Studies* 153.

⁶⁰ Joan Farre-Mensa, Deepak Hegde, and Alexander Ljungqvist, 'What is a patent worth? Evidence from the US patent "lottery"', (2020) 75 *The Journal of Finance* 639.

⁶¹ Sudheer Chava, Vikram Nanda, and Steven Chong Xiao, 'Lending to innovative firms', (2017) 6 *The Review of Corporate Finance Studies* 234.

⁶² Marlene A. Plumlee, Yuan Xie, Meng Yan, and Jeff Jiewei Yu, 'Bank loan spread and private information: Pending approval patents' (2015) *Review of Accounting Studies* 20(2): 593–638.

⁶³ Yanke Dai, Ting Du, Huasheng Gao, and Yan Gu, 'Patent Pledgeability, Trade Secrecy, and Corporate Patenting', (2022) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4132148.

Additionally, Hsu et al. showed that bond premiums are negatively correlated with the impact, originality, generality, and quantity of a company's patent portfolio.⁶⁴ Concerningly, Ayerbe et al. brought to light the potential adverse consequence of patents used as collateral for loans, whereby technology companies may be tempted to veer away from pursuing long-term innovation in favour of short-term strategies centred around patent monetisation and litigation.⁶⁵

Another strand of literature emphasises the economic challenges associated with financing innovative activities in a perfectly competitive market due to the idiosyncratic nature of innovation, which gives rise to significant information gaps between those with insider knowledge and the capital markets.⁶⁶ Given this background, critics of debt financing argue that equity is a better tool for addressing the substantial uncertainty inherent in genuine innovation and the challenges associated with patent rights.⁶⁷ Conversely, debt financing advocates argue that financial institutions can better regulate firms through contract design.⁶⁸ In particular, Ma et al. emphasised that banks should design debt contracts that facilitate idea generation yet provide stronger incentives to implement patented solutions in an effective and efficient way.⁶⁹

4.2 SEPs as financial collateral

Within the realm of patents, SEPs stand out as a specific class of IP assets with exceptional attributes, making them a tremendous candidate to serve as valuable financial collateral and to sustain R&D investments. In essence, while traditional patents are suitable to guarantee loan schemes, SEPs are better placed to safeguard lenders' interests as they generate less economic friction to debt financing. Due to their essential role in implementing standards across various industry sectors, SEPs possess distinctive attributes which render them highly appealing as financial collateral for several compelling reasons.

⁶⁴ Po-Hsuan Hsu, Hsiao-Hui Lee, Alfred Zhu Liu, and Zhipeng Zhang, 'Corporate innovation, default risk, and bond pricing', (2015) 35 *Journal of Corporate Finance* 329.

⁶⁵ Cécile Ayerbe, Jamal Azzam, Selma Boussetta, and Julien Pénin, 'Revisiting the consequences of loans secured by patents on technological firms' intellectual property and innovation strategies', (2023) 52 *Research Policy* 104824.

⁶⁶ For a thorough review of the issue, see Jonathan Haskel and Stian Westlake, *Capitalism without Capital: The Rise of the Intangible Economy*, (2018) Princeton University Press; Bronwyn Hall and Josh Lerner, 'The Financing of R&D and Innovation', (2010) 1 *Handbook of the Economics of Innovation* 609; Robert E. Carpenter and Bruce C. Petersen, 'Capital market imperfections, high-tech investment, and new equity financing', (2002) 112 *Economic Journal* 54.

⁶⁷ James R. Brown, Steven M. Fazzari, and Bruce C. Petersen, 'Financing innovation and growth: Cash flow, external equity, and the 1990s R&D boom', (2019) 64 *Journal of Finance* 151.

⁶⁸ Yuqi Gu, Connie X. Mao, and Xuan Tian, 'Banks' interventions and firms' innovation: Evidence from debt covenant violations', (2017) 60 *Journal of Law and Economics* 637.

⁶⁹ Zhiming Ma, Kirill E. Novoselov, Derrald Stice, and Yue Zhang, 'Firm innovation and covenant tightness', (2022) *Review of Accounting Studies*.

Firstly, SEPs have a relatively high nominal worth, which eliminates the need for banks to engage in overly complex examinations to assess the significance of the assets involved as collateral. In essence, lenders can rely on SEPs, treating them like any other asset with a solid return on investment and less volatile valuation, thereby minimising any information asymmetry and the risks associated with innovative projects.⁷⁰ As demonstrated by Lerner, Tirole, and Strojwas, higher quality patents are more likely to be included in a patent pool functional to cooperative standards.⁷¹ At the same time, Rysman and Simcoe found that patents disclosed in the standard-setting process receive roughly twice as many citations as a set of controls from the same technology class and application year.⁷² While it is widely acknowledged that SEPs are likely to cover the most influential technologies⁷³, Layne-Farrar and Padilla clarified that the inherent positive effects on patent value from being included in a standard depend on a wide range of idiosyncrasies across industries, technologies, standards, patent offices, and SDOs.⁷⁴

Secondly, licensing an SEP does not involve any further transfer of the related know-how and technical information to enable the licensee to use the technology. As argued by Bourreau et al., it simply requires manufacturers to pay for implementing the standard.⁷⁵ Indeed, the essential technology is needed to implement a specific standard across the industry regardless of the patent owner. As they benefit from high transferability, SEPs are easy to redeploy and retain a significantly higher liquidation value, increasing the share creditors can recoup in the case of default as opposed to other types of intangible assets.⁷⁶

Thirdly, by definition, SEPs generate a consistent cash flow due to the continuous need by industry to implement a standard. As argued by Brassell and King, such a steady financial stream deriving from licensing is well-suited to securing loans.⁷⁷ Once a standard gains broad market recognition, the earning generated by the underpinning SEPs is likely to retain a solid market value. Furthermore, as SEPs are subject to FRAND commitments, lenders have room to assess in advance the amount of the cash flow by

⁷⁰ Mary E. Barth, Ron Kasznik, and Maureen F. McNichols, 'Analyst Coverage and Intangible Assets', (2001) 39 *Journal of Accounting Research* 1.

⁷¹ Josh Lerner, Jean Tirole and Marcin Strojwas, 'Cooperative Marketing Agreements Between Competitors: Evidence from Patent Pools', (2003) NBER Working Paper No. 9680, <https://www.nber.org/papers/w9680>.

⁷² Marc Rysman and Timothy Simcoe, 'Patents and the Performance of Voluntary Standard-Setting Organizations', (2008) 54 *Management Science* 1920.

⁷³ Rudi Bekkers, Geert Duysters, and Bart Verspagen, 'Intellectual property rights, strategic technology agreements and market structure: The case of GSM', (2002) 31 *Research Policy* 141.

⁷⁴ Anne Layne-Farrar and Jorge Padilla, 'Assessing the Link Between Standards and Patents', (2011) 9 *International Journal of IT Standards and Standardization Research* 19.

⁷⁵ Marc Bourreau, Yann Ménière, and Tim Pohlmann, 'The Market for Standard Essential Patents', (2015) Working Papers HAL-01261024, <https://www.parisschoolofeconomics.eu/IMG/pdf/market-for-standard-essential-patents-menieres-workshop-pse-june2015.pdf>.

⁷⁶ Hall and Lerner (n 64).

⁷⁷ Brassell and King (n 55).

relying on the pricing mechanisms used in the industry to determine the FRAND licences. This element increases the financial predictability of the intrinsic value of SEPs.

Fourthly, SEPs function as a positive market signal for lenders, as the financial performance of companies active in technology-related markets is not only connected to their innovative capabilities and resources, but also depends on the strategic positioning of their patent portfolio. Notably, the results obtained by Pohlmann et al. showed a curvilinear (inverse U-shaped) relationship of owning SEPs and financial performance and particularly the return on assets.⁷⁸

Therefore, SEPs not only qualify as the most suitable IP asset class to serve as financial collateral, but they also make a strong case in favour of privileged prudential treatment. So far, prudential regulation has obstructed the development of loans secured against intangibles. As loans backed by intangibles are considered riskier than physical assets (e.g. real estate), they are not included in the calculation of banks' regulatory capital. As documented by Dell'Araccia et al., over the last decade, banks have had lower incentives to engage in IP financing and the cost of capital for intangible-intensive firms has increased, leading to a reallocation of banks' portfolios from commercial loans to real estate lending.⁷⁹ Crouzet and Eberly have provided evidence that the simultaneous rise in investment allocated to intangible assets and the relatively limited portion of it funded through bank loans is likely to undermine the effectiveness of monetary policy transmission channels.⁸⁰ This is because investments tend to be less sensitive to shifts in interest rates under these circumstances.

Against this backdrop, the potential of SEPs to guarantee higher and more consistent cash flows, as well as their strong transferability, allow individual institutions to demonstrate the performance and the rates of recovery of SEP asset classes in downside scenarios when assets need to be liquidated independently of the business. Moreover, the prospect, investigated by Brassel and King, of facilitating banks and insurance companies to sustain IP-backed loans is likely to benefit first and foremost SEPs which present a more manageable risk profile than other IP asset classes.⁸¹

In conclusion, SEPs are undoubtedly valuable financial assets, enabling both incumbents and newcomers to secure the necessary funding for innovation in technology-intensive

⁷⁸ Tim Pohlmann, Peter Neuhäusler, and Knut Blind, 'Standard essential patents to boost financial returns', (2016) 46 R&D Management 612.

⁷⁹ Giovanni Dell'Araccia, Dalida Kadyrzhanova, Camelia Minoiu, and Lev Ratnovski, 'Bank Lending in the Knowledge Economy', (2017) IMF Working Paper No. 2017/234, <https://www.imf.org/en/Publications/WP/Issues/2017/11/07/Bank-Lending-in-the-Knowledge-Economy-45343>.

⁸⁰ Nicolas Crouzet and Janice C. Eberly, 'Understanding Weak Capital Investment: the Role of Market Concentration and Intangibles', (2019) NBER Working Paper No. 25869, <https://www.nber.org/papers/w25869>.

⁸¹ Martin Brassell and Kelvin King, 'Banking on IP? The role of intellectual property and intangible assets in facilitating business finance', (2013) Report commissioned by the UK Intellectual Property Office, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/312008/ipresearch-bankingip.pdf.

markets. Therefore, it is crucial to warn against regulatory initiatives that could potentially disrupt the delicate economic foundation that supports the financial viability of SEPs.

5. Concluding remarks

The comparison between the purported goals and envisaged solutions of the Draft Regulation provides a clear, yet surprising, picture of the EU SEP landscape. Spurred on by concerns over the emergence of the IoT across several industries, the European Commission has portrayed SEP holders as a hindrance to innovation and growth due to an apparently inefficient licensing ecosystem. The main remedies put forward in the Draft Regulation are to introduce significant costs and restrictions on SEP holders, ostensibly in pursuit of a value-redistribution agenda designed to favour implementers. The assumption underlying the proposal is that patent hold-up issues are the primary cause of inefficiencies in the European SEP market.

However, this worrisome narrative does not reflect reality. The very same study commissioned to support the regulatory intervention reveals no evidence of an SEP litigation failure in Europe, arguing that there is no indication that current SEP licensing conditions systematically suppress or delay standard implementation or that FRAND licensing friction is causing SEP owners to contribute less to standard development or is inducing implementers to opt for alternative standards.

While these findings call into question the justification of the overhaul proposed by the Commission in the first place, the potential side effects of the Draft Regulation are further amplified by the endorsed hold-up approach. Indeed, by suggesting solutions to a problem that apparently does not exist, the Commission is devaluing European SEPs and granting implementers leeway to engage in opportunistic behaviours and to reap all the benefits of the standardisation process.

This paper scrutinises the Commission's proposed remedies, maintaining that such a profound restructuring of SEP licensing dynamics is likely to trigger a surge in opportunistic behaviours among market participants. Consequently, SEP owners may face mounting transaction costs associated with licensing negotiations and strong risks of failing to recover their investments. By the same token, the Draft Regulation could inadvertently undermine its own objectives by dissuading collaborative standardisation efforts in favour of proprietary solutions. Indeed, as acknowledged by the European Commission in the Impact Assessment, standard creation is a resource-intensive R&D activity, and lengthy negotiations and the high cost of licensing may reduce the incentives for SEP owners to participate in the development of new standards.

Finally, we argue that the Draft Regulation has failed to consider the financial dimension of technological innovation, namely the potential of SEPs to function as valuable financial assets. By reviewing the relevant theoretical and empirical literature, the paper demonstrates that SEPs are one of the most promising IP asset classes to be used as financial collateral and they receive more favourable prudential treatment than other intangibles. Indeed, SEPs present all the features to sustain R&D and financial investments in technological innovation. In fact, it is essential for a modern

standardisation framework to provide incentives for carrying out R&D investments in the first place.

By undermining the economic value of SEPs in terms of enforcement and monetisation, the Draft Regulation is watering down their potential to serve as valuable financial collateral and therefore to help innovators access debt financing. Disregarding the fundamental links between patents and finance may have serious consequences on innovation and competitiveness.