

## Standard-Essential Patents and FRAND Licensing – At the Crossroads of Economic Theory and Legal Practice

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### Key Points

- The *Huawei v. ZTE* judgment provides the framework for efficient party negotiations. This doctrine not only establishes a court-guided system of offer-and-counter-offer structures but also requires the court – when negotiations have failed – to scrutinise and determine concrete FRAND conditions.
- In cases of a ‘double FRAND stalemate’ (i.e., when both sides have submitted a FRAND offer but no agreement has been reached), courts must analyse each offer in light of its capacity to enable a negotiated agreement. Rule of thumb: the more flexible and open to compromise the offer, the higher its chances of being FRAND.
- The FRAND commitment also implies the use of a royalty base in accordance with the so-called SSPPU rule. Furthermore, SEP owners are obliged to enter into good-faith licensing negotiation with any actor at any market level or level in the supply chain (license-to-all approach).

### I. Introduction

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Standardisation shapes all areas of our life.<sup>1</sup> The determination of right-hand or left-hand traffic and the standardisation of electrical plugs and socket shapes are examples of very simple standards. More complex standardisation can be found in the internet, computer, and telecommunications (ICT) industry – for example, the standardisation of data transfer in technologies such as Long-Term Evolution, WLAN, and Bluetooth.

The main benefit of standardisation is the creation of interoperability.<sup>2</sup> By creating seamless co-functionality among different products, standardisation not only reduces the cost of production

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<sup>1</sup> See, e.g., Shapiro, in: Cooper Dreyfuss et al. (eds.), *Expanding the Boundaries of Intellectual Property*, 2001, 81, 81-82.

<sup>2</sup> For a detailed discussion, see, e.g., Shapiro, in: Cooper Dreyfuss et al. (eds.), *Expanding the Boundaries of Intellectual Property*, 2001, 81, 88-90.

but also saves costs because users and consumers are no longer forced to purchase and use a large number of parallel devices and technologies. At the same time, standardisation leads to increased competition in downstream markets. For example, standardised mobile transmission technologies (e.g., LTE, 4G, and 5G) make it possible to access various network providers and to use a multitude of mobile devices from different manufacturers. Especially in the ICT industry, standardisation is therefore essential for innovation.<sup>3</sup>

Yet disadvantages loom. Standards are usually based on a large number of patents, the use of which is indispensable for implementing standard technology. Such patents are therefore called standard-essential patents (SEPs). Integration into a standard makes the SEP and its technical teaching the practically sole alternative. A standard cannot be implemented in practice without using SEPs and their technology. Hence, no product can be sold without making use of a patented technology. And standardisation not only threatens to end competition at the level of technology.<sup>4</sup> With standardisation, the utilisation of a SEP also becomes a sine qua non for market access. And quite often, there are considerable costs associated with exiting or switching to other technologies. If a user has already invested in the implementation of a standard, she may be in a cul-de-sac since changing to another technology would mean abandoning the investment already made.<sup>5</sup> It is this compatibility threshold for alternative technical solutions that gives considerable market power to SEP holders.<sup>6</sup> Economists call this a ‘patent hold-up’.<sup>7</sup> It is a situation in which a SEP holder can negotiate much higher licence fees than without an integration into the standard.<sup>8</sup> Hence, if rights are enforced too rigorously, competition and innovation come to a standstill, and, ultimately, excessive licence fees will be passed on to consumers.<sup>9</sup>

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<sup>3</sup> See, e.g., EU Commission, Communication to the European Parliament, the Council and the European Economic and Social Committee, Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final, p. 1.

<sup>4</sup> Swanson/Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust L.J.* 73 (2005), 1, 8-9.

<sup>5</sup> See, e.g., Farrell/Shapiro, Intellectual Property, Competition, and Information Technology, UC Berkeley Working Paper No. CPC04-45 (17.3.2004), 29-30; Lemley/Shapiro, Patent Holdup and Royalty Stacking, 85 *Tex. L. Rev.* 1991, 2008-2009 (2007); Michel, Bargaining for RAND Royalties in the Shadow of Patent Remedies Law, *Antitrust L.J.* 77 (2011), 889, 891-892.

<sup>6</sup> Opinion of Advocate General Wathelet delivered on 20 November 2014, ECLI:EU:C:2014:2391, para. 58.

<sup>7</sup> The foundations of patent hold-up and royalty stacking are largely acknowledged. Yet the lack of empirical testing is increasingly the focus of the debate. See, e.g., Jonathan D. Putnam, Economic Determinations in “FRAND-Rate”-Setting, 41 *Fordham Int’l L.J.* 953, 1003 (2018).

<sup>8</sup> Layne-Farrar/Padilla/Schmalensee, Pricing Patents for Licensing in Standard-Setting Organizations: Making Sense of FRAND Commitments, *Antitrust L.J.* 74 (2007), 671, 672.

<sup>9</sup> Farrell/Hayes/Shapiro/Sullivan, Standard Setting, Patents, and Hold-Up, *Antitrust L.J.* 74 (2007), 603, 608 and 644-647. When more than one SEP is integrated into a standard, the hold-up detriment is reinforced by the effects of so-called royalty stacking. Economists describe this as the *Cournot* effect. See, e.g., Lemley/Shapiro, Patent Holdup and Royalty Stacking, 85 *Tex. L. Rev.* 1991, 2013-2016 (2007).

Against this backdrop, it is no surprise that standardisation is subject to antitrust regulation. To start with, standardisation requires ‘agreement’ among participants – i.e., competitors – and raises concerns of cartelisation. Hence, so-called standard setting organisations (SSOs) prevent the application of Article 101 of the Treaty on the Functioning of the European Union (TFEU) by requiring their participants to promise to license their SEPs to third parties on terms that are FRAND – **F**air, **R**easonable, **A**nd **N**on-**D**iscriminatory.<sup>10</sup> At the same time, a FRAND undertaking seems to guarantee that SEP holders do not violate rules against market abuse, namely Article 102 of the TFEU. Whether a refusal to license is abuse is by far the most contested issue in practice.

This paper conceptualises a framework for answering the most pressing questions both with respect to the process of FRAND negotiating prior to and during litigation and with respect to the determination of FRAND conditions after negotiations have failed. The number of scholarly analyses is enormous. And practice has not been idle. Not only have many national courts adjudicated on this issue, but the Court of Justice of the European Union (CJEU), in its 2015 *Huawei v. ZTE* judgment, has laid down extensive rules on licensing negotiations.

Notwithstanding this exuberance, actual court practice is inconsistent and devoid of clear structure, both within and across different jurisdictions. The situation thus resembles a chaos rather than a systematic legal doctrine. Much of this, of course, is due to the fact that the concept of FRAND is complex and that legal doctrine (especially case law) requires time to evolve. Yet, at the moment, the problem also is due to the fact that economics and law still coexist in different universes. Economists may very well understand the issues involved but find it difficult to communicate to lawyers; meanwhile, lawyers may want to understand but lack the time (and expertise) to indulge themselves in economic theory. This paper seeks to bridge that gap. I start by providing an overview of the state of the discussion. Much of this overview refers to European case law, particularly court decisions in Germany (which still seems to be the most important national forum in terms of case numbers).<sup>11</sup> Even though details may be influenced by the peculiarities of national procedural doctrine, the issues being litigated are representative of all legal regimes (infra II). With respect to the analysis, the focus is on the role of courts and the importance of judicial decision-making in SEP licensing disputes (infra III). In addition, there is no doctrine for a consistent determination of FRAND conditions. As a consequence, courts are

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<sup>10</sup> In the US, the requirement is RAND, leaving out a ‘Fairness’ requirement. However, this version has no perceptible conceptual or practical differences from its European counterpart.

<sup>11</sup> A helpful (albeit not representative) overview of different jurisdictions’ case law (and case numbers) concerning ‘case law post CJEU ruling *Huawei v ZTE*’ can be found at <https://caselaw.4ipcouncil.com/> (last accessed on 6 April 2020).

regularly confronted with a host of technical and economic pitfalls – a challenge that exceeds their expertise. After all, judges hardly consider themselves ‘royalty regulators’ – much less moderators of licensing negotiations. It comes as no surprise, therefore, that courts regularly resort to FRAND determination ‘by proxy’ – e.g., by reference to preexisting parameters such as an industry licensing practice. As a closer look at these practical proxies shows, a more hands-on approach linking economic theory and legal practice helps us reconceptualise numerous aspects of legal doctrine (infra IV).

## II. The Status Quo

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Needless to say, it is hard to provide an overview of *all* issues related to SEP licensing, for the field is far too vast. Yet two central ambiguities lie at the core of economic and legal debates: the process of licensing negotiations and the mode of determining FRAND conditions.

Ambiguity begins with the question whether a court should analyse FRAND conditions *at all*. Some academics suggest that courts should not undertake a detailed examination of each case’s FRAND-ness. Instead, they should limit themselves to a ‘plausibility check’, scrutinising only whether a party’s offer is ‘evidently’ non-FRAND.<sup>12</sup> Although the contrary view – calling for a thorough FRAND analysis by the courts – clearly seems to be the majority position,<sup>13</sup> the dispute is not too much of a surprise: Apparently, ‘royalty regulation’ seems to be something to be avoided (if necessary, at the high price of virtually denying access to justice).

But even if we agree that courts should be tasked with performing a full-fledged FRAND analysis, numerous details are unclear. *Prima facie*, of course, there is agreement that, in order to determine FRAND licensing fees, courts must undertake a so-called comparable licences approach. This requires investigating the rates agreed to in other licensing agreements that are ‘comparable’ to the one in dispute.<sup>14</sup> This is essentially what US courts do.<sup>15</sup> But making a practical determination can be difficult. Courts regularly refer to existing agreements for the SEP (or SEP portfolio) at issue, or to agreements concerning ‘technically and economically comparable’ patents.<sup>16</sup> Yet these preexisting benchmarks may differ on numerous accounts:

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<sup>12</sup> See, e.g., in German scholarship: Müller/Henke Mitt. 2016, 62, 64; Maume/Tapia GRUR Int. 2010, 923, 925.

<sup>13</sup> See, e.g., in German case law: OLG Düsseldorf GRUR 2017, 1219 Rn. 170 – Mobiles Kommunikationssystem; OLG Düsseldorf GRUR-RS 2016, 1679 – Zwangsvollstreckung; OLG Karlsruhe NZKart 2016, 334, 337 – Informationsaufzeichnungsmedium; from the UK: Unwired Planet v. Huawei [2017] EWHC 711 (Pat) para. 738; see also Kurtz ZGE 2017, 491, 504-505; Schulte/Rinken, PatentG, 10. Aufl. 2017, § 24 Rn. 111.

<sup>14</sup> See, e.g., Leonard/Lopez, Determining RAND Royalty Rates for Standard-Essential Patents, Antitrust 29 (2014), 87, 91; Kühnen, Handbuch der Patentverletzung, 11. Aufl. 2019, Teil E Teil E Rn. 254.

<sup>15</sup> See, e.g., Microsoft Corp. v. Motorola, Inc., 864 F. Supp. 2d 1023, 1039 (W.D. Wash. 2012).

<sup>16</sup> Chappatte, FRAND Commitments – The Case for Antitrust Intervention, E.C.J. 5 (2009), 319, 338-339.

There may be cross-licensing elements or other relational peculiarities, such as if the parties have included their ‘licensing element’ into an overall agreement concerning long-term relations or the settlement of former litigation. Moreover, the duration and scope of the agreements and the terms of payment may vary. In all these examples, a direct comparison may be not only difficult but even impossible.<sup>17</sup> The fact-finder will hardly fare better if no ‘benchmark’ agreements exist and she must refer to the industry’s ‘licensing practice’ that is supposed to provide ‘indicative evidence’.<sup>18</sup> Furthermore, apart from such problems of fact finding, courts and scholars tend to neglect the unequal bargaining power that is present in SEP licensing scenarios.<sup>19</sup> If at all, they suggest that the unequal market power between right owner and user be mitigated by granting the user a ‘discount’ on the regular fee.<sup>20</sup>

Besides, another hotly debated issue is the problem of how to determine the market level or the level in a supply chain that is relevant for the calculation of licence fees. This problem generally arises when the SEP at issue covers the component of a compound product. Intuition suggests using the component price as a royalty base. After all, the component technically implements the patent’s teaching. But this is not acknowledged in practice. In the ITC industry in particular, practice refers to the end product’s price.<sup>21</sup> This means that, for example, when a standard technology for mobile communication and data transfer is used in a mobile phone or a connected vehicle, it is the full price of the smartphone or the automobile that is supposed to form the base for fee calculation. In the US, a similar discussion has evolved around the distinction between the so-called entire market value rule (EMV rule) and what is called the smallest saleable unit or smallest saleable patent pricing unit rule (SSPPU rule), in which the fee for compound products is generally calculated based on the price of the smallest marketable component. Yet an exception applies when the patent is essential not only for the marketing of the component but also for the compound.<sup>22</sup>

Closely related to computation issues is the question whether the FRAND commitment obliges a SEP owner to license to *every* third party requesting a licence or whether she can select the market level or level in the supply chain in which to grant a licence. The latter is called the

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<sup>17</sup> Leonard/Lopez, Determining RAND Royalty Rates for Standard-Essential Patents, *Antitrust* 29 (2014), 87, 91.

<sup>18</sup> Tapia, Industrial Property Rights, Technical Standards and Licensing Practices (FRAND) in the Telecommunications Industry, 2010, 36; Kühnen, *Handbuch der Patentverletzung*, 11. Aufl. 2019, Teil E Teil E Rn. 254.

<sup>19</sup> See, e.g., in German practice: LG Düsseldorf BeckRS 2017, 132078 Rn. 230 – Mobilstation.

<sup>20</sup> See, e.g., Schulte/Rinken, *PatentG*, 10. Aufl. 2017, § 24 Rn. 119 and 124 f.

<sup>21</sup> Nilsson, *GRUR Int.* 2017, 1017, 1021 et seq.; Kühnen *GRUR* 2019, 665, 671-672.

<sup>22</sup> See, e.g., *Virnetx, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1326 (Fed. Cir. 2014); *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012). For a critique, see, e.g., Love, Patentee Overcompensation and the Entire Market Value Rule, 60 *Stan. L. Rev.* 263, 278-280 (2007).

access-for-all approach. Naturally, licence fees are highest at the level of end-product markets. Unsurprisingly, current practice in some ICT industries has established a practice of selective end-level licensing. The so-called license-to-all approach, by contrast, considers SEP holders to be obligated to grant a licence to *any* third party, regardless of the market or supply chain level.<sup>23</sup> Finally, controversy exists regarding the handling of so-called royalty stacking. This usually concerns cases where there is no comparable licence agreement and where courts thus attempt to calculate the adequate fee on the basis of an assessment of the value of all patents implemented in the product at issue. This method does not determine the appropriate price of a licence for each individual SEP (which would be a ‘bottom-up’ approach). Instead, it asks what the maximum amount of fees are that can be charged to a user in order to compensate all SEP holders at issue. This is called the aggregate royalty, which is distributed among individual right holders (making it a ‘top-down’ approach).<sup>24</sup> The top-down approach is usually characterised as not wanting to overburden the user. The perspective is forward looking: Under an assumption that further SEPs will subsequently be enforced, the court must limit each fee to the respective SEP’s proportional share of the overall aggregate royalty. In short, granting too much too early will result in an excessive amount of aggregate fees toward the end. After determining the aggregate, courts have to apportion the amount amongst the SEP holders. This requires looking at the strength, duration, and coverage of the SEPs at issue.<sup>25</sup> Roughly put, for instance, if a plaintiff holds 15% of all relevant SEPs in a standard, and if the industry’s royalty rate is 2% of the end product’s sales price, the FRAND royalty she may receive will be 0.3% of the user’s proceeds. Apart from the practical problems of determining and apportioning the royalty, courts – namely German ones – have established a rather high threshold for consideration of stacking issues: the mere ‘theoretical possibility’ of stacking will not suffice to consider a proportional reduction of fees.<sup>26</sup> Instead, the user must prove an ‘overwhelming probability’ of unreasonably

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<sup>23</sup> See, e.g., *Borghetti/Nikolic/Petit*, FRAND Licensing Levels under EU Law (13.2.2020), p. 35 et seq. and passim (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3532469](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3532469)); *Geradin*, SEP Licensing After two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address (3.3.2020), p. 16 (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3547891](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547891)).

<sup>24</sup> *Geradin*, SEP Licensing After two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address (3.3.2020), p. 10 (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3547891](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547891)); for German practice see, e.g., *Kurtz/Straub*, GRUR 2018, 136, 141-143.

<sup>25</sup> *Geradin*, SEP Licensing After two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address (3.3.2020), p. 10 (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3547891](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547891)).

<sup>26</sup> See, e.g., OLG Düsseldorf, 30.03.2017 – I-15 U 66/15, GRUR 2017, 1219 – Mobiles Kommunikationssystem; *Kellener*, Festschrift 80 Jahre Patentgerichtsbarkeit in Düsseldorf, 2016, 255, 280.

accumulated fees in the future and, accordingly, that she will then face an ‘unreasonable burden’.<sup>27</sup>

### III. Negotiations Framework

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To date, legal scholars have largely overlooked the interrelation between parties’ licensing negotiations and courts’ ultimate scrutiny of FRAND conditions. The Huawei/ZTE doctrine’s effect on party negotiations is usually explained as (and thereby reduced to) a mere elimination of information asymmetries during the negotiation process. As it appears, the only purpose is to make negotiations possible to force the parties into an offer and counter-offer mechanism and to oblige them to unveil their understanding of FRAND conditions. Not surprisingly, as mentioned above, some voices even conclude that the courts are exempt from having to scrutinize each offer’s FRAND-ness. This limited perspective is myopic, for it overlooks the fact that judicial scrutiny of the parties’ offers for FRAND-ness is a precondition of ‘fairness’ and, hence, that an efficient outcome of negotiations depends on the ‘shadow’ of that ultimate judicial scrutiny and sanctioning. As a closer look unveils, the Huawei/ZTE doctrine can be explained in light of the so-called Coase and Hobbes theorems – two governing concepts for the theory of party negotiations.

#### 1. Coase, Hobbes, and the ‘Shadow of the Law’

The so-called Coase theorem is considered a central component of the economic analysis of law.<sup>28</sup> Most fundamentally, the theorem prescribes that the structure and content of a legal norm for the assignment of rights or liability is irrelevant as long as transaction costs are zero. If the parties can negotiate without cost, they will agree on an efficient allocation and utilisation of rights and on an efficient compensation of damages.<sup>29</sup> Hence, the content of legal norms is largely irrelevant for efficiency and welfare. The idea of a zero-transaction-cost Elysium is attractive for economists because it means that intervention in the market is avoided. Based on the assumption that activities within the marketplace are efficient *as such*, any external intervention (especially by the state) must be considered to be detrimental to efficiency. Furthermore, if the marketplace mechanism of competition is the only one that can transfer and

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<sup>27</sup> See, e.g., the legal commentary of an appellate justice in the Düsseldorf Appellate Court’s (OLG) patent senate: *Rinken*, in: Schulte (Fn. 14) § 24 Rn. 66.

<sup>28</sup> Cf. Ronald Coase’s 1960 landmark article “The Problem of Social Cost” (Coase, *J. Law & Econ.* 3 (1960), 1) and his earlier work “The Nature of the Firm” (Coase, *Economica* 4 (1937), 386).

<sup>29</sup> Cooter, *The Cost of Coase*, *J. Legal Stud.* 11 (1982), 1, 14.

process information correctly, any external intervention is an arrogation of knowledge that (as Friedrich von Hayek explained) must be avoided.<sup>30</sup>

This concept of a self-regulating mechanism of market transacting is based on the tacit assumption connecting the concepts of competition and efficiency with the idea of a perfect rationality among market actors. In short, whenever transaction costs are minimal and actors behave rationally, market activity will automatically lead to an efficient allocation of available resources.<sup>31</sup> However, trust in the market's self-regulating ability has never been unclouded. Indeed, critics have always maintained that rationality alone is not enough to guarantee party agreement. As they explain, negotiations on the distribution of the surplus benefits of a transaction may fail – *namely* as a consequence of actors' rationality.<sup>32</sup> This holds true especially when no market price exists, typically in situations of a so-called bilateral monopoly – a scenario in which both sides lack competitors and, hence, where there are no alternatives to the transaction at issue. Since the parties cannot use the market price as a reference point to distribute the surplus that their transaction promises, the risk of mutual overcharging and of a failure of the transaction exists. Hence, the rational pursuit of one's own benefit may not always guarantee the emergence of an agreement and an efficient transaction.<sup>33</sup> To avoid market failure of this kind, party negotiations must be 'regulated'. Typically, this takes the form of intervention by lawmakers or the courts.<sup>34</sup> Because of its rather pessimistic attitude towards the functioning of the marketplace, this approach is referred to as the Hobbes theorem.<sup>35</sup>

In order to conceive of legal norms that provide for the best possible framework for marketplace transacting, both the Coase and the Hobbes theorems must be complied with. The Coase theorem requires legal norms to be structured in such a way that transaction costs are minimised. Only then will the marketplace work on its own. It is then of utmost relevance to clearly define property rights and to assign these rights to private actors.<sup>36</sup> Since it concerns lawmaking, this aspect of the theorem is described as the *normative* Coase theorem.<sup>37</sup> If transaction costs cannot

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<sup>30</sup> F.A. Hayek, *The Use of Knowledge in Society*, *Am. Econ. Rev.* 35 (1945), 519, 524-528.

<sup>31</sup> Calabresi, *Transaction Costs, Resource Allocation and Liability Rules – A Comment*, *J. Law & Econ.* 11 (1968), 67, 68 ('Thus, if one assumes rationality, no transaction costs, and no legal impediments to bargaining, *all* misallocations of resources would be fully cured in the market by bargains. '); Regan, *The Problem of Social Cost Revisited*, *J. Law & Econ.* 15 (1972), 427, 428-432.

<sup>32</sup> Cooter/Marks/Mnookin, *Bargaining in the Shadow of the Law: A Testable Model of Strategic Behavior*, *J. Legal Stud.* 11 (1982), 225; Cooter, *The Cost of Coase*, *J. Legal Stud.* 11 (1982), 1, 17-20.

<sup>33</sup> Cooter/Marks/Mnookin, *Bargaining in the Shadow of the Law: A Testable Model of Strategic Behavior*, *J. Legal Stud.* 11 (1982), 225, 228; Cooter, *The Cost of Coase*, *J. Legal Stud.* 11 (1982), 1, 17.

<sup>34</sup> Cooter, *The Cost of Coase*, *J. Legal Stud.* 11 (1982), 1, 18.

<sup>35</sup> Cooter/Marks/Mnookin, *Bargaining in the Shadow of the Law: A Testable Model of Strategic Behavior*, *J. Legal Stud.* 11 (1982), 225, 242-244; Cooter, *The Cost of Coase*, *J. Legal Stud.* 11 (1982), 1, 18.

<sup>36</sup> Cooter/Ulen, *Law and Economics*, 6<sup>th</sup> ed. 2014, 77 f.

<sup>37</sup> Cooter/Ulen, *Law and Economics*, 6<sup>th</sup> ed. 2014, 78.



be reduced or avoided, the content of legal norms does matter (even under the Coase theorem). In such cases, accordingly, lawmakers and courts must provide for an efficient allocation of property rights *ex lege*.<sup>38</sup> This namely requires that rights (as resources) be assigned to the party with the greatest utility.

In addition to the normative Coase theorem, there exists a practical guideline for lawmaking that is explained as the normative *Hobbes* theorem.<sup>39</sup> In essence, this theorem is about the suppression of non-cooperative party conduct. Under a game-theoretical perspective, the theorem requires the elimination of non-cooperative party strategies that provide for the least efficient outcome. Typically, non-cooperative party conduct and strategies are subject to legal sanctions. For instance, virtually all legal systems have established prohibitions of coercive or violent means of transacting (read: rules against theft, extortion, and robbery).<sup>40</sup> A similar conduct-regulating aim can be found in norms providing for sanctions against non-performance of a contract and in rules on contract invalidity in usury or unfairness scenarios. All these norms are, so to speak, normative-Hobbes-style regulation – they reduce private actors' incentives to behave opportunistically and to follow hard-bargaining strategies in party negotiations.

Therefore, in addition to actual dispute resolution in cases where negotiations have failed, legal sanctions have the function of channelling and nudging the parties' negotiations towards a mutually agreeable solution. The prospect of judicial scrutiny of the parties' conduct and negotiation strategies directs the negotiation dynamics towards a 'corridor' of agreement options. None of the parties has an incentive to bring forward high- or lowball offers. In sum, it is the prospect of a 'regulated' transaction that provides the groundwork for successful party negotiations. Seen in this light, it becomes obvious that it is the combination of the normative Coase and the normative Hobbes theorem that creates a framework for so-called bargaining in the shadow of the law. Both functions of judicial decision-making – its future dispute resolution (as actual determination of the outcome of a dispute) and its present regulatory effect on the parties' negotiation strategies (its shadow, so to speak) – are inseparably intertwined. The one cannot function without the other.

## 2. Huawei/ZTE: 'FRAND as a process'

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<sup>38</sup> Cooter, *The Cost of Coase*, J. Legal Stud. 11 (1982), 1, 18.

<sup>39</sup> Cooter/Ulen, *Law and Economics*, 6<sup>th</sup> ed. 2014, 78 f.

<sup>40</sup> Cooter, *The Cost of Coase*, J. Legal Stud. 11 (1982), 1, 18.

Seen in light of the interplay of normative Coase and Hobbes theorems, the Huawei/ZTE doctrine emerges as a well-structured and efficient setting for licensing negotiations. The Huawei/ZTE framework combines elements of both theorems: First, it removes information-related obstacles to the parties' negotiations, and second, it eliminates opportunistic party strategies by making it unviable for a party to offer non-FRAND conditions.

In principle, the holder of an intellectual property (IP) right can take legal action against any unauthorised use of her right. A complaint will be regarded as an 'abuse of market power' only within the meaning of Article 102 of the TFEU under so-called exceptional circumstances.<sup>41</sup> In the case of the enforcement of a SEP, such exceptional circumstances are characterised by two aspects: (1) the use of the SEP is essential for third parties – hence, licensing is necessary for market entry; and (2) the status of the SEP was obtained as consequence of the holder's irrevocable commitment to license under FRAND conditions. In order to avoid abusive SEP enforcement of this kind, the CJEU, with its Huawei/ZTE mechanism, demands a structured negotiating process between the parties. These negotiations begin with the SEP holder's notification to the user about the alleged patent infringement. In terms of transaction costs, the function is evident: notification provides the information necessary to start negotiations. If the user has been informed accordingly, she must express the will to acquire a FRAND licence. Only then must the SEP owner submit a written offer to license. Here as well, information asymmetry must be overcome: the right holder is usually better informed about the circumstances – both her own and within the marketplace – that are relevant for determining FRAND conditions.

Once information levels have been adjusted, the SEP user is asked to react. First, she must respond 'in accordance with recognised commercial practices in the field and in good faith'. This particularly implies that she must not use 'delaying tactics'. If she does not accept the offer, she must react 'promptly and in writing', with 'a specific counter-offer that corresponds to FRAND terms'. In addition, she must provide adequate security from the point of rejection of the SEP owner's offer. Here, the normative Coase theorem looms: Even if the owner's offer was *not* FRAND, the user still is obligated to submit a counter-offer that actually *is* FRAND.<sup>42</sup> This both lowers transaction costs and maintains prospects for an agreement: only if the user discloses her general willingness to license *and* the conditions of such an agreement can negotiations continue. Finally, if no agreement can be reached on the basis of the offer and counter-offer, there is still the option of requesting – 'by common agreement' – the determination of the licence fee by an

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<sup>41</sup> For the following analysis of Huawei/ZTE, see Case C-170/13, Huawei v ZTE, ECLI:EU:C:2015:477, paras. 46-68.

<sup>42</sup> Case C-170/13, Huawei v ZTE, ECLI:EU:C:2015:477, para. 55.

‘independent third party’.<sup>43</sup> Only if no agreement can be reached on the third-party conflict resolution will the court have to decide on the FRAND-ness of each party’s offer. In this regard, even though each party may have offered FRAND conditions, an agreement may still fail.<sup>44</sup> This implies that determination of FRAND conditions is not statically founded on a specific amount of licensing fees or value of other conditions. Rather, it is a ‘spectrum’ or ‘corridor’ of potentially divergent contractual terms and licensing conditions.<sup>45</sup>

In sum, the Huawei/ZTE mechanism clearly displays elements of the normative Coase theorem: The parties’ obligations to provide for transparency, as well as the limitation of response time, reduce transaction costs. In addition, the disclosure of both sides’ understanding of what constitutes FRAND conditions does more than increase the likelihood of an agreement – with their respective offer, each party signals to the court a corridor of FRAND conditions. This reduces the margin of error in the court’s decision. Under this perspective, the paradigm of ‘FRAND as a process’, as explained by Justice Birss in *Unwired Planet v. Huawei*, is apt.<sup>46</sup>

Yet the true mechanics are more complex. Judicial scrutiny for FRAND-ness also functions as a corrective for opportunistic strategies of hard bargaining. If an offer is not FRAND, the offering party risks losing her case. This is a powerful ‘shadow’ of judicial sanctions that creates a strong incentive for each party to aim her respective offer most securely into the FRAND corridor – not beyond, but also not too close to the boundaries. As a closer look shows, looking at Huawei/ZTE under such a game-theoretical perspective helps explain the different scenarios of FRAND and non-FRAND offers and counter-offers.

### 3. Practical Application

Most generally, Huawei/ZTE provides the legal framework for potentially repeat cycles of negotiation rounds consisting of offers and counter-offers. The loop allows each party to start a

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<sup>43</sup> Case C-170/13, *Huawei v ZTE*, ECLI:EU:C:2015:477, para. 68.

<sup>44</sup> See, e.g., OLG Düsseldorf BeckRS 2016, 21067 – *Mobiles Kommunikationssystem*; OLG Karlsruhe GRUR-RS 2016, 17467 – *Dekodierungsvorrichtung*; but see also *Unwired Planet v. Huawei* [2017] EWHC 711 (Pat) para. 150.

<sup>45</sup> Cf. *Unwired Planet International Ltd v Huawei Technologies Co Ltd*, [2018] R.P.C. 20 para. 121 (‘In our judgment it is unreal to suggest that two parties, acting fairly and reasonably, will necessarily arrive at precisely the same set of licence terms as two other parties, also acting fairly and reasonably and faced with the same set of circumstances. To the contrary, the reality is that a number of sets of terms may all be fair and reasonable in a given set of circumstances.’); *Rechtbank Den Haag* 8 februari 2017, ECLI:NL:RBDHA:2017:1025, para. 4.3 (*Archos S.A./Koninklijke Philips N.V.*) (Neth.); see also Sidak, *What Makes FRAND Fair? Criterion J. on Innovation 4* (2019), 701, 716 and 720; Kurtz/Straub GRUR 2018, 136, 140.

<sup>46</sup> *Unwired Planet v. Huawei* [2017] EWHC 711 (Pat) para. 162.

new negotiation after failure in the previous round. Depending on the parties' strategies and whether the offers are FRAND or non-FRAND, different scenarios may occur:

In the event that the SEP owner's offer is not FRAND or if she rejects the user's offer, the owner is confronted with the so-called antitrust defence to her patent infringement claims.

Particularly in German courtrooms, a patent infringement claim will then be dismissed.<sup>47</sup>

Notwithstanding the dismissal, the owner can file a new complaint under the condition that she has resumed negotiations with the user and made a new – this time FRAND compliant – offer.<sup>48</sup>

The SEP user can also expect to lose her case if her offer is non-FRAND or if she delays negotiations. This at least holds true if the owner has offered FRAND conditions.<sup>49</sup> Following a verdict in favour of the owner, the user can restart the Huawei/ZTE loop by requesting a licence and thereby specifying and offering FRAND conditions. If the SEP owner rejects the new offer, the antitrust defence will become effective.<sup>50</sup> If both parties' offers miss the FRAND standard, the SEP holder faces dismissal since it is upon her to avoid an abuse of market power by offering FRAND conditions. Here as well, however, the dismissal will not block a new round of negotiations.<sup>51</sup> The owner can restart the loop any time by offering FRAND conditions.

One scenario, however, has been widely unexplored so far: cases where the parties fail to agree despite two FRAND offers. This scenario can be called a double-FRAND-stalemate scenario. Some commentators assume that the Huawei/ZTE framework does not provide a solution for cases of this kind.<sup>52</sup> Others suggest that users have the antitrust defence.<sup>53</sup> The counter-position points out that the SEP holder, by submitting a FRAND offer, has done everything necessary to avoid allegations of market-power abuse. In short: she is obliged only to offer FRAND conditions, not to actually strike an agreement.<sup>54</sup> In addition, some voices bring forward a 'negotiation in the negotiation' solution: Since the parties are obliged to negotiate in good faith, a party refusing to resolve the standoff without 'good reasons' would have to be considered as acting unfairly (and, accordingly, would lose her case).<sup>55</sup> Even more radically, finally (although

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<sup>47</sup> See, e.g., LG Mannheim GRUR-RS 2016, 06527 Rn. 59 - Informationsaufzeichnungsmedium; for more details: Schulte/Rinken, PatentG, 10. Aufl. 2017, § 24 Rn. 115.

<sup>48</sup> See, e.g., OLG Düsseldorf, Urt. V. 30.03.2017 – I-15 U 65/15 – Kommunikationsvorrichtung; LG Mannheim GRUR-RS 2016, 06527 Rn. 60 – Informationsaufzeichnungsmedium.

<sup>49</sup> See, e.g., Kellenter/Verhauwen GRUR 2018, 761, 771.

<sup>50</sup> BGH GRUR 2009, 694 Rn. 30 – Orange-Book-Standard.

<sup>51</sup> Kellenter/Verhauwen GRUR 2018, 761, 771.

<sup>52</sup> Geradin, SEP Licensing After two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address (3.3.2020), p. 5 (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3547891](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547891)).

<sup>53</sup> See, e.g., Müller/Henke Mitt. 2016, 62, 65.

<sup>54</sup> Kellenter, Festschrift 80 Jahre Patentgerichtsbarkeit in Düsseldorf, 2016, 255, 271-272.

<sup>55</sup> Kühnen, Handbuch der Patentverletzung, 11. Aufl. 2019, Teil E Rn. 359; similar Schulte/Rinken, PatentG, 10. Aufl. 2017, § 24 Rn. 115.

this finds little support in the CJEU's judgment), some commentators suggest that parties unable to agree should be directly submitted to an independent third party's FRAND determination.<sup>56</sup>

As a closer look unveils, none of these positions is convincing. Instead, the double-FRAND-stalemate must be seen in light of the normative Hobbes theorem and its aim to eliminate hard-bargaining strategies. The fundamental problem is this: If the stalemate is too casually resolved in favour of one of the parties, this party's FRAND offer will essentially be the deal. In other words, if the user must fear losing the antitrust defence, she has little choice but to accept the SEP holder's offer and its concrete FRAND conditions. Vice versa, an owner will seldom achieve a better 'negotiated deal' after her infringement claim has been dismissed. Given the asymmetry of market power between SEP holder and user, it would be particularly problematic to reduce the owner's obligation to the mere submission of a FRAND offer. After all, she could then opportunistically aim at the upper margin of the FRAND corridor.<sup>57</sup> With regard to the 'negotiation in the negotiation' approach, finally, it is questionable whether asking for 'good reasons' for refusing to agree is a workable metric to resolve a deadlock. Indeed, it would be very hard to determine exact guidelines for such an unwritten paradigm.

Seeing 'fairness' as an element of FRAND, however, it can be argued that merely submitting an offer that is genuinely FRAND is not enough. This holds true especially if the offeror aims at the upper (or lower) margin of the FRAND corridor.<sup>58</sup> Examination in light of the FRAND-as-a-process paradigm rather requires a much more effective deterrence of opportunistic and hard-bargaining strategies. In other words, the negotiating parties must be resolutely directed away from high- and lowballing techniques. A practical example of the implementation of this concept can be found in the 'offer to compromise', or '998 offer', of Californian civil procedure.<sup>59</sup> Under the Californian rule, each party to a legal dispute can submit an offer to settle prior to the court proceedings. This offer is documented by the court. If the other side refuses to agree and litigation follows, the outcome – i.e., the court's decision – will be compared with the conditions of the 998 offer. If the terms of the offer would have been more favourable for the rejecting party than the ultimate outcome, she must reimburse the other party and forfeit her own claim for reimbursement. For instance, if the plaintiff rejects the defendant's offer to pay US\$10,000,

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<sup>56</sup> *Geradin*, SEP Licensing After two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address (3.3.2020), p. 5 (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3547891](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547891)).

<sup>57</sup> See *supra* xxx.

<sup>58</sup> See also Sidak, What Makes FRAND Fair? Criterion J. on Innovation 4 (2019), 701, 713 ('... a fair price must be an interior solution, not a corner solution.').

<sup>59</sup> See Cal. Civ. Proc. Code § 998 (withholding or augmenting costs following rejection or acceptance of offer to allow judgment). See also Cooter/Marks/Mnookin, Bargaining in the Shadow of the Law: A Testable Model of Strategic Behavior, J. Legal Stud. 11 (1982), 225, 244-245.

and the court later awards the defendant US\$8,000 only, she must pay the defendant's court costs.<sup>60</sup>

Overall, the offer-to-compromise concept reduces the frequency of court proceedings.<sup>61</sup> Hence, the 'shadow' of the judicial decision has an impact on each party's expected value of the litigation outcome: the offeror will consider the possibility of reimbursement for her court costs as a bonus, which is why – in her offer – she will go beyond the expected sum of the outcome. When deciding whether to accept or reject the offer, the offeree will consider that a too-rigid bargaining strategy may entail additional costs for reimbursing the other party.<sup>62</sup>

Of course, this approach cannot be applied directly to licensing negotiations, but it can be used to structurally determine the resolution in double-FRAND-stalemate cases. First, the regulation of opportunistic strategies through a FRAND-specific fairness requirement must capture both sides' offers. For the resolution of a standoff, the issue is which of the parties' offers better provides for an agreement. Each offer is to be measured by whether and how it extends or reduces the so-called bid-ask spread – i.e., the range for an agreement. The wider this range, the greater the likelihood of an agreement.<sup>63</sup> At the same time, this means that the more rigidly one side insists on special conditions (even though, in sum, her offer may be FRAND), the higher the risk of a failure of the negotiations. In this case, the party will have to bear the risk that her offer be classified as 'not fair' under the FRAND standard.<sup>64</sup>

In practice, the issue may usually come down to the question whether the respective conditions are reasonable under an economic perspective. For instance, if a SEP holder's offer provides only for an *international* portfolio licence, but if she cannot justify this extended condition by proving cost advantages, her offer may fail the fairness test. By the same token, the same may apply if a SEP user insists on a national or regional licence without providing economically reasonable grounds to justify the geographical limitation.

#### IV. Determination of FRAND Conditions

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<sup>60</sup> See Cal. Civ. Proc. Code § 998 (c), (d) and (e).

<sup>61</sup> Cooter/Marks/Mnookin, *Bargaining in the Shadow of the Law: A Testable Model of Strategic Behavior*, J. Legal Stud. 11 (1982), 225, 244.

<sup>62</sup> See Cooter/Marks/Mnookin, *Bargaining in the Shadow of the Law: A Testable Model of Strategic Behavior*, J. Legal Stud. 11 (1982), 225, 244-245.

<sup>63</sup> On the bid-ask spread as an indicator for fairness, see Sidak, *The Meaning of FRAND, Part I: Royalties*, J. Comp. L. & Econ. 9 (2013), 931, 990; Sidak, *What Makes FRAND Fair?* Criterion J. on Innovation 4 (2019), 701, 721 and 727-731.

<sup>64</sup> Sidak, *What Makes FRAND Fair?* Criterion J. on Innovation 4 (2019), 701, 721.

As a look at the game-theoretical foundation of Huawei/ZTE has illustrated, judicial scrutiny of FRAND-ness is essential.<sup>65</sup> Judges must not take a hands-off approach – to the contrary. Yet hardly any of the economic analyses allow for direct application in the courtroom. It thus comes as no surprise that legal practitioners, when determining FRAND conditions, still refer to proxies, particularly preexisting licensing agreements and industry practices. This approach is not to be condemned in principle. However, it must be supplemented with a more economic perspective – namely, the economic model of patent protection.

## 1. Economic Foundations of SEP Licensing

The major aim of patent protection is to create an optimal level of innovative activity.<sup>66</sup> Such a level will not materialize if innovation is left to the market mechanism alone. The investment of the inventor is usually not amortised if left to the marketplace without regulation. Without legal protection, competitors can use the information embodied in an invention free of charge – e.g., a drug's formula or the idea for a machine. Profits are then reduced to zero, and inventors can no longer cover their costs for innovation. Under a static perspective, of course, low prices and widespread distribution of innovations may be desirable. When viewed under the lens of dynamic efficiency, however, it can be seen that if prospects of amortisation are destroyed, incentives for innovation will vanish.<sup>67</sup> The granting of patent rights resolves this dilemma.

Unfortunately, it is impossible to derive detailed specifications for the scope of protection from the economic model. The reality is too complex.<sup>68</sup> Nevertheless, it can be assumed that patent protection ensures an *essentially* well-balanced calibration of costs and benefits – and, accordingly, provides for an innovation-friendly ecosphere.<sup>69</sup> It is thus important to see that the balance must not be disturbed by intervention through other regulatory concepts, namely antitrust law. Hence, antitrust regulation comes into play only if the patent system is clearly out of balance.<sup>70</sup>

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<sup>65</sup> See *supra* III.

<sup>66</sup> Menell/Scotchmer, Intellectual Property Law (chapter 19), 1473, 1476, in: Polinsky/Shavell, Handbook of Law and Economics, Vol. 2, 2007.

<sup>67</sup> Menell/Scotchmer, Intellectual Property Law (chapter 19), 1473, 1476-1477, in: Polinsky/Shavell, Handbook of Law and Economics, Vol. 2, 2007.

<sup>68</sup> Landes/Posner, The Economic Structure of Intellectual Property Law, 2003, 300, 310 ff.

<sup>69</sup> Patterson, Inventions, Industry Standards, and Intellectual Property, 17 Berkeley Tech. L. J. 1043, 1081 and *passim*. (2002); Swanson/Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, Antitrust L.J. 73 (2005), 1, 2-3; Farrell/Hayes/Shapiro/Sullivan, Standard Setting, Patents, and Hold-Up, Antitrust L.J. 74 (2007), 603, 623.

<sup>70</sup> Andreas Heinemann, Immaterialgüterschutz in der Wettbewerbsordnung, 2002, 187; Swanson/Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, Antitrust L.J. 73 (2005), 1, 2-3; cf. also Case C-170/13, Huawei v ZTE, ECLI:EU:C:2015:477, para. 46-47 (describing antitrust regulation as an 'exceptional' instrument in intellectual property enforcement scenarios).

In essence, patent protection is designed to assign the innovator the value of her innovation.<sup>71</sup> The innovation's market price serves as a benchmark.<sup>72</sup> If an innovator receives less than the actual market value, the level of investment in innovative activities will fall below the optimum. This would be an inefficient status of the economy. Yet over-compensation may also lead to inefficiency. Of course, the prospect of higher yields may increase innovative activity in the short term. But since higher protection will increase costs for subsequent innovation, the overall level of innovation will drop.<sup>73</sup> This effect particularly touches areas of complex product innovation, such as the ICT industry, where patent infringement is more likely than in sectors with less elaborately designed products.<sup>74</sup> Moreover, it is not only the reduction of access (and the monopoly-typical deadweight losses) but also an inefficient relocation of investments from other sectors of the economy, as well as rent seeking, that must be feared.<sup>75</sup> Finally, the flow of information will be disturbed. Patents function as signals in the marketplace.<sup>76</sup> The market value of the patent reflects the social benefit of the invention. This mechanism directs innovative activity to areas with the greatest need.<sup>77</sup> Over-compensation, however, inevitably leads to misdirection.

Against this backdrop, it is clear that the exact determination of FRAND conditions requires a clear distinction: The exercise of market power may be justified by the economic model of innovation incentives, mediated by patent protection. Yet the exercise of market power is not justified to the extent that it results from a so-called patent-related hold-up – that is, if it is not directly correlated to innovation but only to the standard setting as such.<sup>78</sup> In order to separate these two elements of market power, it is important to distinguish the value of a patent at the time *before* its integration into the standard from its value *after* its integration. FRAND conditions

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<sup>71</sup> Maurer/Scotchmer, Profit Neutrality in Licensing: The Boundary Between Antitrust Law and Patent Law, *Am. L. & Econ. Rev.* 8 (2006), 476, 481-483.

<sup>72</sup> Judge Giles Rich of the Federal Circuit masterfully expressed this in terms of a *quid pro quo* between the inventor and the lawmaker: '[I]t is one of the legal beauties of the system that what is given by the people through their government—the patent right—is valued automatically by what is given by the patentee. His patent has value directly related to the value of his invention, as determined in the marketplace. In short, notwithstanding the grant of a patent, if the inventor has given nothing, the government has given nothing.' *Application of Kirk*, 376 F.2d 936, 964 (C.C.P.A. 1967).

<sup>73</sup> See, e.g., Green/Scotchmer, On the division of profit in sequential innovation, *RAND J. Econ.* 26 (1995), 1, 26-27.

<sup>74</sup> Love, Patentee Overcompensation and the Entire Market Value Rule, 60 *Stan. L. Rev.* 263, 278-280 (2007).

<sup>75</sup> Plant, The Economic Theory Concerning Patents for Inventions, *Economica*, Vol. 1 (1934), 30, 40-41; Landes/Posner, The Economic Structure of Intellectual Property Law, 2003, 300 and 304.

<sup>76</sup> Long, Patent Signals, 69 *U. Chi. L. Rev.* 625 (2002).

<sup>77</sup> Blair/Cotter, Intellectual Property: Economic and Legal Dimensions of Rights and Remedies, 2005, 16-17.

<sup>78</sup> Patterson, Inventions, Industry Standards, and Intellectual Property, 17 *Berkeley Tech. L. J.* 1043, 1044, 1054, 1056-1078 (2002); see also EU Commission, Communication to the European Parliament, the Council and the European Economic and Social Committee, Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final, p. 8.



reflect the patent's value *before* integration. Later on, the vice of a patent hold-up has already 'infected' the right's value.

## 2. FRAND = *Ex Ante* Competition Value

In light of these economic foundations, the determination of FRAND conditions must ignore the standardisation-related increase in market power. With regard to licensing fees, Richard Posner has succinctly explained, 'The purpose of the FRAND requirements ... is to confine the patentee's royalty demand to the value conferred by the patent itself as distinct from the additional value—the hold-up value—conferred by the patent's being designated as standard-essential'.<sup>79</sup> The EU Commission seems to adhere to the same guideline, requiring that 'fees bear a reasonable relationship to the economic value of the IPR'.<sup>80</sup> Even though the reasonability requirement does not give detailed guidance, it essentially implies distinguishing between patent-based and standard-based market-power and fee components.<sup>81</sup>

Contrary to this bright-line distinction, some voices in academia explain that the SEP holder should receive at least *some* of the earnings that are due to standardisation. Otherwise, incentives to participate in standardisation projects would vanish.<sup>82</sup> This argument is not convincing for two reasons: First, standard-inclusion of a patent at a price that is *competitive* (i.e., the *ex ante* competition price) is hardly a disadvantage compared to alternative ways of exploitation without standardisation. In this case, the patent owner would actually face direct technological competition. How this should generate higher yields would still have to be explained. Second, with inclusion of her patent into the standard, the owner receives nothing short of a 'guarantee' for unimpaired market presence in the future. Of course, she may earn the *competitive* price only (and not a monopoly rent). Yet future sales figures of the standard-based product – and, hence, of the patented component – are guaranteed. This usually goes far beyond the sales numbers of a solo marketing of the patented technology. In sum, therefore, the mere prospect of standard

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<sup>79</sup> Apple, Inc. v. Motorola, Inc., 869 F. Supp. 2d 901, 913 (N.D. Ill. 2012, Posner, C.J.).

<sup>80</sup> EU Commission, Communication: Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, O.J. EU 2011/C 11/01, para. 289 (referring to Case 27/76, United Brands, para. 250, and Case C-385/07 P, Der Grüne Punkt – Duales System Deutschland GmbH, [2009] ECR I-6155, para. 142).

<sup>81</sup> See also Shapiro/Varian, Information Rules, 1999, 241; Patterson, Inventions, Industry Standards, and Intellectual Property, 17 Berkeley Tech. L. J. 1043, 1044, 1054, 1056-1078 (2002); Farrell/Hayes/Shapiro/Sullivan, Standard Setting, Patents, and Hold-Up, Antitrust L.J. 74 (2007), 603, 615; Lemley/Shapiro, A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents, 28 Berkeley Tech. L. J. 1135, 1139-1140 (2013); Grasso, J. Eur. Comp. L. & Pract. 8 (2017), 283, 287, 290 f.

<sup>82</sup> Sidak, The Meaning of FRAND, Part I: Royalties, J. Comp. L. & Econ. 9 (2013), 931, 975-978, 1022 and passim.

integration will ensure incentives for both innovation and participation in standardisation projects.

The most workable method for distinguishing between the different components of market power and fees, usually referred to as determination of the so-called *ex ante* licensing price or value, has been explained by Daniel G. Swanson and William J. Baumol. In essence, their method primarily asks for the result of an auction before or at the time of standard determination. In this regard, the authors make a number of simplifying assumptions, *inter alia* that numerous patent holders (with interchangeable alternative rights) do compete for standard implementation.<sup>83</sup> Application for implementation is conceived of as being accompanied by a licence offer – i.e., an offer of the patent to be licensed at a *competitive* price. As the model suggests, licensing conditions under such an auction would be free from standardisation-based and *ex post* market power effects and, accordingly, FRAND.<sup>84</sup> In practice, of course, such auctions are never undertaken. Besides, negotiations between owners of would-be SEPs and would-be standard users or SSOs *prior to standardisation* are the exception. Therefore, the Swanson-Baumol model takes recourse to a theoretical model comparing the market value of a SEP as the ‘best’ technical solution (for a specific technology in the standard) with the ‘second best’ technological alternative at the time of standard implementation.<sup>85</sup> The question to be answered then is what an SSO would have offered to pay for integration of the patent if there had been competition between the technological alternatives.<sup>86</sup>

As with the auction model, practical proxies for the hypothetical SSO/patent owner transaction are hard to find. For example, it is regarded as an indication if a SEP holder has expressly commented on the value of the licence fee before inclusion into the standard.<sup>87</sup> Such self-evaluation and *ex ante* disclosure of licence terms is a common means of signalling to an SSO that the right not only offers a technically superior solution but (once implemented) will also be

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<sup>83</sup> For a critique of the model’s alleged over-simplification see, e.g., Damien Geradin, Pricing Abuses by Essential Patent Holders in a Standard-Setting Context: A View from Europe, *Antitrust L.J.* 76 (2009), 329, 352-356.

<sup>84</sup> Swanson/Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust L.J.* 73 (2005), 1, 15-21; see also Chappatte, FRAND Commitments – The Case for Antitrust Intervention, *E.C.J.* 5 (2009), 319, 337; Lemley/Shapiro, A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents, 28 *Berkeley Tech. L. J.* 1135, 1147-1148 (2013).

<sup>85</sup> Swanson/Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust L.J.* 73 (2005), 1, 23; see also Chappatte, FRAND Commitments – The Case for Antitrust Intervention, *E.C.J.* 5 (2009), 319, 337; Patterson, Inventions, Industry Standards, and Intellectual Property, 17 *Berkeley Tech. L. J.* 1043, 1056-1073 (2002).

<sup>86</sup> Evidently, the SEP owner may not always be able to recover the full incremental value. Depending on her negotiation skills, she may skim between 0% and 100% of the difference. See also Lemley/Shapiro, Patent Holdup and Royalty Stacking, 85 *Tex. L. Rev.* 1991 (2007); but see Elhauge, Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?, *J. Comp. L. & Econ.* 4 (2008), 535, 561-565.

<sup>87</sup> Farrell/Hayes/Shapiro/Sullivan, Standard Setting, Patents, and Hold-Up, *Antitrust L.J.* 74 (2007), 603, 660; Chappatte, FRAND Commitments – The Case for Antitrust Intervention, *E.C.J.* 5 (2009), 319, 337-338.

licensed under reasonable conditions.<sup>88</sup> In addition, if a SEP owner has contracted prior to standardisation with other users (possibly even in other industries), such pre-standardisation licences are used as indications of market value.<sup>89</sup>

Besides, in order to guarantee that conditions are not only 'fair' and 'reasonable' but also 'non-discriminatory', the Swanson-Baumol model is supplemented by application of the so-called efficient component pricing rule (ECPR). This modification is based on the consideration that a right holder who not only licenses but also operates at a subsequent market level may have an incentive to restrict competition. In other words, if the SEP owner is also manufacturing standard-based products herself, she must comply with additional requirements of fair licensing.<sup>90</sup> More concretely, this means that her licensing conditions are determined on the basis of what she would have to charge to herself in a downstream marketplace. Simply put, the SEP holder is regarded as her own licensee.<sup>91</sup> In practice, the *ex ante* competition perspective and the ECPR method will usually provide the same results.<sup>92</sup>

Finally, as a practical matter, it is important to note that the Swanson-Baumol model is based on the assumption that the standard consists of a *single* SEP. Theoretical models for scenarios with more than one SEP are more complex.<sup>93</sup> Yet despite variances with respect to the distribution of the licensing proceeds among the holders, these models also take an *ex ante* marketplace analysis as their starting point. In essence, these concepts also disregard the standardisation-based component of market power. Ultimately, the results under both models are largely equivalent.<sup>94</sup>

In sum, the Swanson-Baumol model and its recourse to an analysis of market conditions prior to standardisation allows us to draw a fundamental conclusion: Depending on how intense competition in the technology market was prior to standardisation, the *ex ante* competition fee will be lower or higher. If no equivalent alternative technologies to a patent existed, the fee will be higher.<sup>95</sup> Yet if competition on the technology market used to be intense, the *ex ante* market

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<sup>88</sup> Geradin/Rato, Can Standard-Setting Lead to Exploitative Abuse? A Dissonant View on Patent Hold-Up, Royalty Stacking and the Meaning of FRAND, *Europ. Comp. J.* 2007, 101, 131.

<sup>89</sup> See *supra* II.

<sup>90</sup> Layne-Farrar, *J. Comp. L. & Econ.* 6 (2010), 811, 824 ff.

<sup>91</sup> On this basis, the following relationship applies (per piece): *ex ante* market value = product price<sub>SEP holder</sub> – marginal costs<sub>SEP holder</sub>. See Swanson/Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust L.J.* 73 (2005), 1, 30-31.

<sup>92</sup> Swanson/Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, *Antitrust L.J.* 73 (2005), 1, 37.

<sup>93</sup> See the *Shapley*-value model explained by Layne-Farrar, Padilla and Schmalensee (in Pricing Patents for Licensing in Standard-Setting Organizations: Making Sense of FRAND Commitments, *Antitrust L.J.* 74 (2007), 671).

<sup>94</sup> Layne-Farrar/Padilla/Schmalensee, Pricing Patents for Licensing in Standard-Setting Organizations: Making Sense of FRAND Commitments, *Antitrust L.J.* 74 (2007), 671, 700-701.

<sup>95</sup> Leonard/Lopez, Determining RAND Royalty Rates for Standard-Essential Patents, *Antitrust* 29 (2014), 87, 89.

value will be lower. In extreme cases – namely where numerous technical alternatives existed – the fee will approximate zero.<sup>96</sup>

### 3. Practical Application

Economic theory seems to suggest that legal certainty and precision are nothing but a question of exact calculation. Yet, in practice, the determination of FRAND conditions is fraught with ambiguity.<sup>97</sup> Looking at central aspects of current legal doctrine under a more economic perspective helps us reevaluate the theoretical foundations and modify the practical proxies.

#### a) Market Level: Relevant Product Price and ‘Right to Negotiate’

When the value of a licence is at issue, the most essential question centres on determination of the relevant market level. With respect to SEPs that cover components of a complex compound product, two aspects are of particular importance: First, legal theory and practice regularly refer to the end product’s price as the basis for fee calculations. This conflicts with the goal of distinguishing the SEP’s innovation value from hold-up elements. Second, practice in some industries is selective licensing at the end-product level. Here, negative effects on competition are disregarded.

#### aa) EMV vs. SSPPU

To start, it is important to note that the choice of the basis for fee calculation must not affect the actual amount. FRAND licensing is about determining the *ex ante* competition value or price of the licence. This value must be independent of the *method* of FRAND determination (read: calculation).<sup>98</sup> In other words, it should make no difference whether the parties agree on a lump-sum, a sales, or a unit licence. In the case of a percentage determination based on unit prices, the fee is calculated based on ‘product price’ (so-called base) and ‘percentage’ (so-called rate). The remuneration should not depend on whether the royalty is based on the price of the end product

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<sup>96</sup> See, e.g., Lemley/Shapiro, Patent Holdup and Royalty Stacking, 85 Tex. L. Rev. 1991, 2002-2003 (2007); Chappatte, FRAND Commitments – The Case for Antitrust Intervention, E.C.J. 5 (2009), 319, 337-338; Sidak, The Meaning of FRAND, Part I: Royalties, J. Comp. L. & Econ. 9 (2013), 931, 989-992.

<sup>97</sup> Cf. TCL Comm’n Tech. Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson, 2017 WL 6611635, at \*8 (C.D. Cal. Dec. 21, 2017) (“The search for precision and absolute certainty is a doomed undertaking.”).

<sup>98</sup> *Gautier/Petit*, J. Comp. Law & Econ. 15 (2019), 690, 692; *Teece/Sherry*, On the “Smallest Saleable Patent Pricing Unit” Doctrine: An Economic and Public Policy Analysis, Tusher Center for the Management of Intellectual Capital, Working Paper Series No. 11 (20.1.2016), p. 23; see also *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1338 f. (Fed. Cir. 2009).

(e.g., the smartphone) or on the price of the component which reads on the SEP and its technical teaching (e.g., the broadband chip): If the product price is higher, a relatively lower percentage must be used for the calculation, and vice versa.

Nevertheless, the choice of the relevant ‘product’ and its ‘price’ is essential. Two conflicting approaches exist, each with a different result for the FRAND fee. One resembles the so-called EMV rule in US law, taking the end product’s market price as a basis for licence fee computation. The other is similar to the SSPPU rule (also in US law). This approach uses the price of the smallest saleable component of a compound product – i.e., the component where the patented teaching has been implemented – as its basis.<sup>99</sup> For evident reasons, computation on the basis of the end-product price is preferred by SEP owners.<sup>100</sup> Yet this approach must be rejected for several reasons:

First, in order to avoid confusion, technical functionality, product utility, and market value must be distinguished. It is important to note that the technical necessity of a component for the functioning of a compound product does not reflect the components’ respective market value. Accordingly, the component manufacturer cannot demand a disproportionate share in the value of the end product. An example helps illustrate this point: In complex products, e.g., smartphones, the number of technically essential components can be immense. The compound product will not work without the individual components. For a smartphone, one may think of the display, the processor, the memory, the battery, or the mobile connectivity. Although the function of each component may be *sine qua non* for the functioning of the end product, the compound product’s market value does not increase in proportion to the number of such components. Rather, the end product’s price is limited to its overall utility for the consumer.<sup>101</sup> Accordingly, the value of each component must be limited to a proportional fraction of the market value of the end product.<sup>102</sup>

This also holds true when the combination of different components increases the utility of the compound beyond the sum of the individual components’ utilities. Such so-called synergy effects come into play, as seen above, in the smartphone manufacturer’s combining of different components. Another example is the combination of ‘mobile communication’ with ‘automobile transportation’. The product ‘autonomous driving’ may offer an overall utility far in excess of the sum of the single components’ utilities. Yet the surplus value is created by the *combination* of the

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<sup>99</sup> See supra text accompanying fn. xxx.

<sup>100</sup> See, e.g., *Nilsen*, GRUR Int. 2017, 1017, 1019.

<sup>101</sup> *Farrell/Hayes/Shapiro/Sullivan*, Antitrust L.J. 74 (2007), 603, 622-623.

<sup>102</sup> *Lemley/Shapiro*, 85 Tex. L. Rev. 1991, 2024 ff. (2007).

components. Without the innovative input of combination (even if the ‘spark of genius’ is small), there is no increase in utility. Accordingly, the single components and their market prices must be distinguished from the overall utility that partly results from their combination.

Quite differently, proponents of an EMV rule – i.e., the approach taking the end product’s price as the royalty base – demand that the surplus utility created by the combination of different components be distributed among the components. As they argue, the ‘actual value’ of each component should comprise all further increases in utility beyond the mere component price.<sup>103</sup> The idea is that an inventor should always be remunerated with the value equivalent to the consumer’s utility – including the surplus that has been created in downstream markets. Only in this case, it is argued, will the patent owner’s compensation guarantee an effective mechanism to incentivise innovative activities.<sup>104</sup>

What proponents of this approach overlook is the fact that innovation can and does take place separately at each market level. If one always wanted to reward innovators in upstream markets with the total yield in downstream marketplaces, the scope of patent protection would extend far beyond the share indicated by the economic model. Indeed, every inventor would have a right to skim the value of subsequent innovations.<sup>105</sup> Over-compensation would be inevitable, especially in SEP licensing scenarios. Once more going back to the economic model of patent protection and its application in the FRAND context: The SEP owner should participate in the value of her *innovation* – not in the value of other actors’ contributions, and also not in components of an end product that are in the public domain.<sup>106</sup> In particular, other non-patent-protected technical elements, the product design, trademark rights, and marketing efforts must be disregarded.<sup>107</sup> The EU Commission also seems to have recognised this approach: For determining FRAND licensing fees, the present value of the patented technology must be considered – the market success of the end product, however, must be disregarded if it has nothing to do with the patented technology.<sup>108</sup>

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<sup>103</sup> *Sidak*, J. Comp. L. & Econ. 10 (2014), 989, 994 f.; *Teece/Sherry*, On the “Smallest Saleable Patent Pricing Unit” Doctrine: An Economic and Public Policy Analysis, Tusher Center for the Management of Intellectual Capital, Working Paper Series No. 11 (20.1.2016), p. 10-11 and p. 16 et seq.; *Nilsson*, GRUR Int. 2017, 1017, 1021.

<sup>104</sup> *Teece/Sherry*, On the “Smallest Saleable Patent Pricing Unit” Doctrine: An Economic and Public Policy Analysis, Tusher Center for the Management of Intellectual Capital, Working Paper Series No. 11 (20.1.2016), p. 17 f.; *Nilsson*, GRUR Int. 2017, 1017, 1021; *Kühnen*, GRUR 2019, 665, 670 and 671.

<sup>105</sup> *Lemley/Shapiro*, 85 Tex. L. Rev. 1991, 2024 ff. (2007).

<sup>106</sup> See supra IV. See also *Love*, 60 Stan. L. Rev. 263, 272-284 (2007); *Lemley/Shapiro*, 85 Tex. L. Rev. 1991, 2024 (2007); *Grasso*, J. Eur. Comp. L. & Pract. 8 (2017), 283, 287.

<sup>107</sup> *Layne-Farrar/Padilla/Schmalensee*, Antitrust L.J. 74 (2007), 671, 676.

<sup>108</sup> EU Commission, Communication to the European Parliament, the Council and the European Economic and Social Committee, Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final, p. 8.

In addition to the economic arguments in its favour, the SSPPU rule is also supported by judicial practice. Unlike the jury system in US law, proceedings before civil law courts may not necessarily bring a risk of incorrect fee evaluation due to anchor or framing effects. Professional judges, unlike members of lay juries, are less likely to fall prey to heuristic errors. Accordingly, one must not expect them to be ‘manipulated’ into an unconscious overvaluation of SEP licence fees when (higher) end-product prices form the basis for fee calculation.<sup>109</sup> Yet the SSPPU rule, with its focus on ‘smaller’ units of a product and its value, necessarily avoids many of the complexities of value determination on the basis of a complex end product’s full price. Of course, issues of value allocation may also come up for components. This is the case particularly if a component cannot be further divided into saleable parts, but additional patents exist. Yet, even then, the task is easier to handle for the courts since the assessment is already reduced to a smaller number of relevant aspects.<sup>110</sup>

#### **bb) Right to FRAND Negotiations (also as of Value and Supply Chains)**

Closely related to the issue of relevant product prices is the question whether the SEP holder, in complex value and supply chains, is obliged to enter into licensing negotiations with parties at *every* level, or whether she can limit herself to licensing to the end-product manufacturer only (so-called OEM-level licensing).<sup>111</sup> Representatives of the latter view point to the saving of transaction costs and the existing practice of exclusive licensing in many industries.<sup>112</sup> This approach not only neglects the economic foundation of SEP licensing but also disregards the negative effects on competition in the component markets.

First, the normative framework of a right owner’s FRAND commitment does not imply a restriction with respect to the actors’ positions in the value chain. Rather, as stated by the EU Commission in its guidelines on agreements on horizontal cooperation, a FRAND commitment brings the obligation to ‘offer to license ... essential IPR to all third parties on fair, reasonable and non-discriminatory terms’.<sup>113</sup> A practice of selective licensing can hardly be reconciled with

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<sup>109</sup> For US law, see, e.g., *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1320 (Fed. Cir. 2011); see also *Gautier/Petit*, J. Comp. Law & Econ. 15 (2019), 690, 699 ff.

<sup>110</sup> Even opponents of the smallest saleable pricing unit rule openly acknowledge this aspect. See, e.g., *Teece/Sherry*, On the “Smallest Saleable Patent Pricing Unit” Doctrine: An Economic and Public Policy Analysis, Tusher Center for the Management of Intellectual Capital, Working Paper Series No. 11 (20.1.2016), p. 6.

<sup>111</sup> The former is called a license-to-all, the latter an access-for-all-approach. See, e.g., *Geradin*, SEP Licensing After two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address (3.3.2020), p. 16 ff. (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3547891](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547891)).

<sup>112</sup> See, e.g., *Gautier/Petit*, J. Comp. Law & Econ. 15 (2019), 690, 698.

<sup>113</sup> EU Commission, Communication: Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, O.J. EU 2011/C 11/01, para. 285.

such an unqualified (and, hence, unrestricted) all-third-parties-access proviso.<sup>114</sup> Unsurprisingly, most SSOs in their FRAND undertaking provisions also require right holders to be fully and unreservedly willing to license to anyone.<sup>115</sup> Above all, the Huawei/ZTE doctrine does not contain any restrictions with respect to the eligibility to ask for a FRAND licence. The CJEU has not stipulated any additional requirement, in particular no obligation for licence seekers to justify their request.<sup>116</sup>

It is settled CJEU case law that abuse of a dominant position under Article 102(a) of the TFEU must be found where an undertaking ‘charges for its services fees which are disproportionate to the economic value of the service provided’.<sup>117</sup> The EU Commission has translated this to the FRAND sphere by requesting that ‘fees bear a reasonable relationship to the economic value of the IPR’.<sup>118</sup> Yet, as a closer look reveals, such excessive pricing is precisely what right holders aim at when insisting on selective licensing at the OEM-producer level: The end-product manufacturer is at risk of significantly greater damage when a SEP holder threatens litigation. That is why fees are significantly higher at the end-product manufacturer level.<sup>119</sup> Anecdotal evidence exists in practice,<sup>120</sup> particularly in the US.<sup>121</sup> The practice of selective licensing, therefore, strongly confirms the suspicion of patent hold-up.

In addition, selective licensing may qualify as a restriction of product output to the detriment of consumers within the meaning of Article 102(b) of the TFEU.<sup>122</sup> Exclusive licensing hinders component manufacturers with respect to their competitive freedom in a number of ways.

First, they cannot rely on their customers’ licences down the supply chain. Such reliance would require the component supplier to act on the licence of her customer and thereby exercise a so-called have-made right. Yet there is no doctrine of have-made rights, neither in the US nor in

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<sup>114</sup> *Nazçini*, World Competition 40 (2017), 213, 225 f.

<sup>115</sup> See, e.g., rule 6.1 ETSI Intellectual Property Rights Policy with reference to *components, sub-systems, and equipment* as well as the use of *methods*. Cf. also rule 6.2 der IEEE-SA Standards Boards Bylaws (‘... that the Submitter will make available a license for Essential Patent Claims to an unrestricted number of Applicants on a worldwide basis’); see also *Grasso*, J. Eur. Comp. L. & Pract. 8 (2017), 283, 292 f.; *Nazçini*, World Competition 40 (2017), 213, 225 f.

<sup>116</sup> *Nazçini*, World Competition 40 (2017), 213, 229 f.

<sup>117</sup> Case C-385/07 P, *Der Grüne Punkt – Duales System Deutschland GmbH*, [2009] ECR I-6155, para. 142; see also Case 27/76, *United Brands*, para. 250.

<sup>118</sup> See *supra* fn. xxx.

<sup>119</sup> *Nazçini*, World Competition 40 (2017), 213, 219 f.

<sup>120</sup> *Grasso*, J. Eur. Comp. L. & Pract. 8 (2017), 283, 288 and 292.

<sup>121</sup> See, e.g., *Fed. Trade Comm’n v. Qualcomm Inc.*, 411 F. Supp. 3d 658, 744 (N.D. Cal. 2019).

<sup>122</sup> It may, however, not be a discrimination under Art. 102(c) of the TFEU. This is due to the fact that actors at different levels of a value or supply chain are not in competition with one another. See, e.g., *Nazçini*, World Competition 40 (2017), 213, 236 ff.; but see also LG Düsseldorf, 11.07.2018, 4c O 77/17, BeckRS 2018, 25099 Rn. 145 ff., 152.



Europe.<sup>123</sup> The closest would be the German legal concept of an ‘extended workbench’ allowing a licensee to have components of a licensed product produced by a third-party non-licensee. But this requires the licensee to direct and to closely oversee component production. Naturally, therefore, further extension of have-made rights upstream the supply chain or the component manufacturers’ production for other suppliers (without a licence) would be impossible.<sup>124</sup>

Second, this uncertainty reduces output. Considering that establishing a workbench or have-made-right relationship is costly, it is evident that a newcomer in the component market will have a hard time substituting an incumbent. At the same time, the incumbent may be locked in to her buyer unless she gets permission to also produce for and sell to other actors or to the open market.<sup>125</sup> In sum, competition at the component market level is hindered.

Of course, the degree of distortion depends on the circumstances. For the mobile device market, for example, it is argued that selective licensing at the end-product level has never reduced competition.<sup>126</sup> Yet, as seen above, there exists more evidence for patent hold-up than for perfect competition. In addition, the argument may be invalid in other sectors. The automotive industry in particular is increasingly afflicted by SEP licensing disputes. As in many sectors of the evolving ‘internet of things’ industry (IoT), no established licensing practice exists.<sup>127</sup> Depending on the number of actors at each level of the supply chain and on their sophistication with regard to licensing issues, the balancing of transaction costs and patent-hold-up detriments may come out differently. Especially if the number of OEM producers is much larger than the number of component manufacturers, possibly scattered over many different IoT industries (e.g., automotive, household appliances, etc.), it may be more efficient to directly license at the component manufacturer level. Also, if component manufacturers are more knowledgeable of the technological values than OEM producers (which is very likely), the risk of patent hold-up can much better be reduced by establishing a license-to-all system.

## **b) FRAND Determination: Some Corrections to Practical Doctrine**

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<sup>123</sup> Geradin, SEP Licensing After two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address (3.3.2020), p. 20 (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3547891](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547891)).

<sup>124</sup> For the German doctrine of the ‘extended workbench’, see, e.g., *Osterrieth*, Patentrecht, 5. Aufl. 2015, Rn. 695.

<sup>125</sup> Geradin, SEP Licensing After two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address (3.3.2020), p. 19-20 (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3547891](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547891)).

<sup>126</sup> *Borghetti/Nikolic/Petit*, FRAND Licensing Levels under EU Law (13.2.2020), p. 36 (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3532469](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3532469)).

<sup>127</sup> Geradin, SEP Licensing After two Decades of Legal Wrangling: Some Issues Solved, Many Still to Address (3.3.2020), p. 17 ff. (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3547891](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3547891)).

With respect to the practical determination of FRAND fees, there are two different methods: a bottom-up and a top-down approach. As a closer look at legal practice shows, legal doctrine needs to be amended and corrected in a number of ways, namely with regard to the economic underpinnings of SEP licensing.

### aa) Step-By-Step Determination: The Bottom-Up Approach

Under the bottom-up approach, courts determine the *ex ante* competition fee for a single SEP or a small SEP portfolio. They usually refer to proxy values, namely existing licensing agreements or industry practice. For all these proxies, it is helpful to take a closer look in light of patent hold-up issues:

First, it is imperative to distinguish between licence agreements that have been concluded *ex ante* and *ex post*. Since *ex ante* agreements are the exception, court practice more or less consists of taking preexisting licensing agreements as a benchmark for value determination. The most fundamental objection against this proxy is that the ‘market fee prices’ derived from such agreements may be a result of distorted market conditions – namely due to standardisation-based hold-up effects. The hold-up problem has been anecdotally explained for the US, where royalty rates have been found to vary between 0.75% without standardisation and 3.5% with standardisation.<sup>128</sup> Accordingly, if the majority of out-of-court licences has been negotiated under conditions of lopsided market power, the whole landscape of existing licence agreements is systematically distorted – resulting in inflated SEP licensing fees.<sup>129</sup>

Furthermore, caution is also required with respect to proxy values for *ex ante* licensing conditions. The picture may not be too distorted when looking at the licences that have actually been requested by patent owners, especially in the case of an *ex ante* disclosure to the SSO. Nevertheless, here as well, problems of over-compensation loom.

First, royalty stacking effects have to be taken into account. Such effects may distort the calculation of FRAND fees due to the fact that a licensee may tend to underestimate her overall burden. When asked to conclude a licensing agreement for a single SEP or a few SEPs, a rational user will usually include *all* standard-essential rights into her calculation.<sup>130</sup> Hence, in addition to

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<sup>128</sup> See, e.g., Patterson, Antitrust and the Costs of Standard-Setting: A Commentary on Teece & (and) Sherry, 87 Minn. L. Rev. 1995, 2001 Fn. 33 (2003).

<sup>129</sup> Lemley/Shapiro, Patent Holdup and Royalty Stacking, 85 Tex. L. Rev. 1991, 2021-2022 (2007); Shapiro, Injunctions, Hold-Up, and Patent Royalties, Am. L. & Econ. Rev. 12 (2010), 280, 308; Leonard/Lopez, Determining RAND Royalty Rates for Standard-Essential Patents, Antitrust 29 (2014), 87, 91.

<sup>130</sup> Lemley/Shapiro, 28 Berkeley Tech. L. J. 1135, 1149-1150 (2013).

the costs for licensing the specifically claimed SEP or SEPs, she will also take into account the expected costs for licensing all other standard-relevant patents and the probability of their enforcement. If the user assumes that only some of these other SEPs will be enforced in the future, she will underestimate the overall burden – the result being that she may be willing to pay more than the market value for licensing the concrete SEP or SEPs at issue. This calculation is by no means erroneous, since it rarely happens that *all* standard-essential rights are enforced. Accordingly, a rational user may be willing to pay more than the market value of the right or rights at issue. The result is that a race to the courthouse (over-)pays.

More generally, it is necessary to ask about the specific circumstances of the contract conclusion and the market conditions for each *ex ante* licence presented as an approximate value. Licensing agreements are highly context sensitive. Reference to preexisting proxies is thus problematic *per se*. Even if an agreement is not distorted by a patent hold-up, the earlier its time of conclusion, the more doubtful it is whether its conditions can still be considered FRAND. The same applies if the proxy agreement contains ancillary agreements (e.g., concerning other IP rights) or if litigation costs have been part of the deal.<sup>131</sup>

Against this backdrop, it is essential to reconsider the rules on the burden of proof. These rules may vary between jurisdictions. Yet a few general concepts apply to all procedural regimes:

In general, a SEP user – as the defendant – has a burden to assert and prove the so-called antitrust defence of an abuse of market power by the SEP owner.<sup>132</sup> However, considering the different status with respect to access to information and documentation, it would be inadequate to require the user to provide full transparency. Rather, with respect to information from within her business sphere, the SEP holder should be burdened with bringing forward information and with providing transparency, namely with respect to preexisting licensing agreements.<sup>133</sup> In litigation practice, this implies that the user will have to substantiate why the conditions offered by the owner are not FRAND. In this regard, she can refer to all the aspects mentioned.<sup>134</sup> The owner will then be asked to explain and prove why her offer is FRAND. Mere reference to

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<sup>131</sup> See, e.g., *Microsoft Corp. v. Motorola, Inc.*, 795 F.3d 1024, 1043–44 (9th Cir. 2015) ('In the current context, ... it was not clear error to reject the past licenses as too contextually dissimilar to be useful to the RAND rate calculation. ... because those portfolios were licensed as part of a broader agreement that settled infringement claims ... The district court reasonably concluded that the[se earlier] licenses were not reliable indicators of the RAND royalty rate.');

see also Sidak, *The Meaning of FRAND, Part I: Royalties*, *J. Comp. L. & Econ.* 9 (2013), 931, 1002–1007.

<sup>132</sup> See Art. 2 Council Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty, O.J. L 001, 4 January 2003, 1 et seq.

<sup>133</sup> See, e.g., OLG Düsseldorf GRUR 2017, 1219 Rn. 177 – *Mobiles Kommunikationssystem*; Kurtz/Straub GRUR 2018, 136, 137; Kühnen, *Handbuch der Patentverletzung*, 11. Aufl. 2019, Teil E Rn. 362.

<sup>134</sup> See *supra* xxx.

comparable prices in *ex ante* licensing may not suffice.<sup>135</sup> Yet this may be different if the plaintiff can show that her conditions are compliant with the ECPR rule.<sup>136</sup>

Furthermore, a SEP owner should be allowed to argue that an increase in licence fees (compared to *ex ante* values) has other causes than a standardisation-related patent hold-up. She may, for instance, submit that her offer is FRAND despite exceeding the *ex ante* competition licence due to the fact that her licensing practice prior to standardisation was characterised by particularities of the case and parties (e.g., by accompanying agreements on other IP rights).

In the same vein, finally, the owner may justify ‘discrimination’ among different licensees,<sup>137</sup> namely in cases where fees vary across different user groups (e.g., early-bird tariffs).

### **bb) Lump-Sum Computation: The Top-Down Approach**

When the number of a plaintiff’s SEPs is large, courts usually determine licence fees in the reverse order: they first compute the maximum amount of fees that are due for standard implementation and *all* its standard-essential rights; then, they distribute aggregate fees among the right owners.

Under current practice of this top-down approach, however, SEP owners have a chance to increase their income beyond the value of their innovation. They simply have to assert rights more quickly than other right holders. In other words, the race to the courthouse pays well. In particular, courts in Germany are very hesitant to apply a proportionality rule with respect to the total number of SEPs.<sup>138</sup> Accordingly, the system is structurally bent in favour of (swift-to-litigate) right owners. Seen in light of its economic underpinnings, this doctrine is distorted. Only by allowing users to bring forward a likelihood of individual over-burdening can the risk of right-holder over-compensation be reduced.<sup>139</sup>

Not surprisingly, the EU Commission also recommends determining FRAND fees with regard to a concept of *reasonable aggregate rates*.<sup>140</sup> For the concrete calculation of reasonable aggregate

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<sup>135</sup> But see OLG Düsseldorf GRUR 2017, 1219 Rn. 177 – Mobiles Kommunikationssystem.

<sup>136</sup> Cf. also Swanson/Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, Antitrust L.J. 73 (2005), 1, 30 (‘safe harbor’).

<sup>137</sup> See EuG, Slg. 2007, II-3601 Rn. 1144 – Microsoft/Kommission; OLG Düsseldorf GRUR 2017, 1219 Rn. 177 – Mobiles Kommunikationssystem; Kühnen, Handbuch der Patentverletzung, 11. Aufl. 2019, Teil E Rn. 362.

<sup>138</sup> See supra xxx.

<sup>139</sup> See also TCL Commc'n Tech. Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson, 2017 WL 6611635, at \*19–20 (C.D. Cal. Dec. 21, 2017); Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1232–1233 (Fed. Cir. 2014); see also Chappatte, FRAND Commitments – The Case for Antitrust Intervention, E.C.J. 5 (2009), 319, 340.

<sup>140</sup> EU Commission, Communication to the European Parliament, the Council and the European Economic and Social Committee, Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final, p. 8.

rates and their allocation among right owners, the total number of standard-implemented rights must be taken as the denominator. Accordingly, the number of the claimant's own SEPs forms the numerator. For instance, if a standard consists of 100 SEPs, and if the plaintiff owns 10 of them, she can claim a maximum of 10% of the total of all SEP licence fees.<sup>141</sup>

In addition, the pro rata allocation of licence fees must be modified with regard to the quality of the rights at issue. Here as well, current doctrine is incomplete, namely due to a lack of information. SSOs may list patents reported as essential. But they usually do not check whether these patents actually *are* essential. Furthermore, patent validity is not checked, either.<sup>142</sup> A judicial investigation of these questions would be time consuming and expensive. However, this must not go so far as to limit the courts' analysis to a strict pro rata rule without further modifications: To start with, the oft-enunciated argument in favour of a rule of strict proportionality is unconvincing. As is contended, all SEPs integrated in a standard must be considered 'equivalent' since all SEPs are essential. Accordingly, there is no difference in value.<sup>143</sup> Yet, among the numerous SEPs integrated into a standard, usually only a few are actually of real value. Indeed, each right has a different relative market value.<sup>144</sup> A simple numerical division of the aggregate lump sum, therefore, contradicts the economic model of utility-oriented patent protection. Besides, a strict pro rata rule would provoke over-declaration. Owners may report patents on the standard that are actually not essential. In fact, even invalid patents may be reported.<sup>145</sup>

These problems can be avoided only if courts also determine the relative value of rights – i.e., both their essentiality and validity. With an eye on the practical difficulties, this requires the following structure of burden-of-proof norms:

It is the SEP user who must request the application of a pro rata rule. If she does not bring forward further aspects concerning the value, essentiality, and legal validity of the SEPs at issue, the court will limit its determination of FRAND fees to a simple proportional division. The SEP owner, however, can demand a larger and disproportionate share of the aggregate fees. She must then explain and prove why such a share is justified.<sup>146</sup> For instance, she may claim that her SEPs

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<sup>141</sup> In addition, the calculation must be refined by taking the rights' validity period into account. See also *TCL Commc'n Tech. Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson*, 2017 WL 6611635, at \*19–20 (C.D. Cal. Dec. 21, 2017); *Chappatte, FRAND Commitments – The Case for Antitrust Intervention*, E.C.J. 5 (2009), 319, 340–341.

<sup>142</sup> *Sidak, The Meaning of FRAND, Part I: Royalties*, J. Comp. L. & Econ. 9 (2013), 931, 958; *Kurtz ZGE 2017*, 491, 495.

<sup>143</sup> See, e.g., *Kurtz/Straub GRUR 2018*, 136, 143.

<sup>144</sup> *Layne-Farrar/Padilla/Schmalensee, Pricing Patents for Licensing in Standard-Setting Organizations: Making Sense of FRAND Commitments*, *Antitrust L.J.* 74 (2007), 671, 677 and 684.

<sup>145</sup> See, e.g., *Lemley/Simcoe, How Essential are Standard-Essential Patents?* 104 *Corn. L. Rev.* 607, 620–628 (2019).

<sup>146</sup> *Chappatte, FRAND Commitments – The Case for Antitrust Intervention*, E.C.J. 5 (2009), 319, 341.

asserted are, on average, of higher value or are more likely to be essential than other owners' rights. In this regard, the court will consider not only the SEPs brought forward by the owner but *all* standard-implemented rights. In addition, in order to avoid manipulation, the list of rights must not be limited to a few 'representative' SEPs from the owner's portfolio. Rather, a complete list of the plaintiff's SEPs must be submitted. If the number of patents should be too large to allow for detailed one-to-one scrutiny, the court will have to randomly select a smaller group to be examined from the list. The same is done for a 'comparison list' comprising *all* standard-implemented rights. These numbers form the numerator and the denominator for the fraction of the owner's aggregate fee proportion.<sup>147</sup>

## V. Summary and Outlook

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With its Huawei/ZTE approach, the CJEU has created an efficient framework for negotiations in FRAND licensing disputes. If the parties fail to reach an agreement, the courts must decide on the specific FRAND conditions. Such scrutiny is essential for reducing hard-bargaining strategies and, ultimately, for laying the groundwork for successful negotiations. Yet, currently, courts are widely left to their own devices when an actual FRAND determination is required. Their reference to practical proxies is all too often fraught with ambiguity, and sometimes practical doctrine perpetuates disproportions in market power. Transparency and information are thus of utmost importance. This will not be achieved through court proceedings alone – it must occur in the sphere of SSOs as well. First of all, more transparency must be brought to standardisation procedures, such as by requiring right holders to prove the essentiality and validity of their rights *ab initio*.<sup>148</sup> Moreover, patent owners should be required to disclose conditions of preexisting licensing agreements.<sup>149</sup> Furthermore, despite antitrust problems with regard to an institutionalised setting of licensing terms,<sup>150</sup> the SSOs should provide guidelines on the relevant factors of FRAND determination, namely with regard to *ex ante* patent and licence values. SSOs could also archive and publish such information.<sup>151</sup> Finally, due to their expertise, SSOs would be the prime fora for dispute settlement. Increased SSO involvement in negotiations and litigation

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<sup>147</sup> See also TCL Comm'n Tech. Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson, 2017 WL 6611635, at \*22–23 (C.D. Cal. Dec. 21, 2017).

<sup>148</sup> EU Commission, Communication to the European Parliament, the Council and the European Economic and Social Committee, Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final, p. 4 et seq.

<sup>149</sup> Lemley, Intellectual Property Rights and Standard-Setting Organizations, 90 Cal. L. Rev. 1889, 1965 (2002).

<sup>150</sup> See, e.g., Swanson/Baumol, Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power, Antitrust L.J. 73 (2005), 1, 13–14; Layne-Farrar/Padilla/Schmalensee, Pricing Patents for Licensing in Standard-Setting Organizations: Making Sense of FRAND Commitments, Antitrust L.J. 74 (2007), 671, 679.

<sup>151</sup> See also Heinemann GRUR 2015, 855, 859.

would ultimately also accommodate the desideratum of an *internationally* harmonised concept of FRAND determination.<sup>152</sup>

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<sup>152</sup> See, e.g., *Unwired Planet International Ltd v Huawei Technologies Co Ltd*, [2018] R.P.C. 20 para. 206.