

Chapter 3

The Relevance of Standardization in a Future Competitive India and the Role of Policy Makers, Antitrust Authorities and Courts to Promote it



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1 Introduction

Knowledge driven economies have understood the importance of Intellectual Property (IP) and its role towards inclusive development of nations. Worldwide, countries continue to evolve their Intellectual Property Right (IPR) laws to best suit their country's socio-economic needs. The common theme in this evolutionary process is implementation of measures that can promote commercialization of IP. It is understood that globally less than 5% of patents are commercialized. Reasons for such low commercialization rate can stem from any of the following: patents were strategically filed for defensive purposes, the right holders do not have sufficient wherewithal to have their patents commercialized, or sectoral constraints exist.¹

The Information and Communications Technology (ICT) sector offers numerous examples of voluntary, industry-led efforts that have addressed the issue of commercialization. One notable example is represented by patented standardized technologies, where standard essential patents (SEPs) are made 'available and accessible' through licensing on fair, reasonable, and non-discriminatory (FRAND) terms and conditions. FRAND commitment ensures that the patented technologies are not 'held up', i.e. industry players are not blocked out of the market, and

¹Ted Sichelman and Stuart JH Graham, 'Patenting by Entrepreneurs: An Empirical Study' (2010) 17 (1) Mich. Telecomm. Tech. L. Rev. 111.

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adoption is guaranteed and encouraged. The benefits to consumers that the ICT industry has achieved in recent years and the emergence of the ‘networked society’ are testaments to the efficiencies and enormous consumer welfare created by the FRAND licensing regime. Due to FRAND the ICT industry has witnessed, among other efficiencies, increased competition, availability of products at falling, competitive prices, removal of market entry barriers and induced direct and indirect network effects.² Almost eight billion subscription base globally (equivalent to world’s population) and over 400 mobile phone manufacturers worldwide testify the efficacy and dynamism of the FRAND licensing model, that thus deserves a ‘hand of blessing’ and not an ‘eye of suspicion’.³

As recognized by antitrust authorities, technology providers who have voluntarily diluted exclusionary rights related to their SEPs deserve in exchange a fair Return on Investment (ROI).⁴ The ROI from patent licensing serves as one of the drivers in technological developments, especially in the ICT sector. Indeed, connecting millions of devices by different vendors with each other and making them work properly together (i.e. allowing for interoperability) can only be achieved when there are sustained efforts made in R&D and continued investments by the broadest base of technology developers and business models.

Despite guaranteeing highly competitive markets and other societal benefits and progress, licensing models based on FRAND are often looked upon with suspicion by some industry members, policy makers, courts and sometimes even consumers. Indeed, over the past few years, a number of competition agencies have shown a keen interest in SEPs. While much of the interest has taken the form of antitrust advocacy, rather than enforcement cases, questionable anticompetitive effects of this focus are beginning to emerge. These include—encouraging patent infringement in violation of the World Trade Organisation’s (WTO) Trade Related Aspects of Intellectual Property Rights (TRIPS) agreement principles; tilting the playing field against market players who do not infringe; and eroding procompetitive standardization to the detriment of consumers.

²Boston Consulting Group (BCG), ‘Mobile Technologies Create Trillion Dollar Impact’ (15 January 2015) <<https://www.bcg.com/d/press/15jan2015-mobile-revolution-technologies-trillion-dollar-impact-835>>.

³See data on subscriptions, mobile networks traffic and forecast. ‘Ericsson Mobility Report’ (November 2017) 4 <<https://www.ericsson.com/assets/local/mobility-report/documents/2017/ericsson-mobility-report-november-2017.pdf>>.

⁴The European Commission advocates in favor of ‘efficient and globally acceptable licensing approach, which ensures a fair return on investment for standard essential patent (SEPs) holders’; See, Commission, ‘ICT Standardization Priorities for the Digital Single Market’ COM(2016) 176 final; Also the Standard Development Organization ETSI recognizes that SEP holder should be ‘fairly and adequately rewarded’; ETSI, ‘Essential IPRs in ETSI’ (2018) <<http://www.etsi.org/about/how-we-work/intellectual-property-rights-iprs>>.

This chapter will explore the motivations and strategies of certain stakeholders to devalue FRAND assured essential patents. It will also address the challenges that the ICT industry is currently facing in the background of past scepticisms from antitrust agencies and courts. Finally, the chapter will recommend policy makers to avoid tilting the fragile balance between technology providers and technology implementers which is achieved through FRAND licensing. An imbalance of interests could, otherwise, potentially affect the innovation cycle, reduce investments in R&D, and favor proprietary solutions as opposed to interoperable, standardized options.

2 Mobile Communications

Mobile phones have become part of our day to day life and, for some people, they are now an indispensable product. To create our smartphones has been a burdensome exercise. A brick-sized phone was developed three decades ago.⁵ Back in the early 1980s, it took more than a decade to get a wireline connection in India and still a phone could not connect globally. Today, cellular technology connects seven billion⁶ people, equivalent to the world's population.

Technological revolution across various generations of cellular technology (1G, 2G, 3G, 4G) in terms of speed and performance has tremendously empowered every sector of society. Standardization has enabled telecom capacities, aesthetics, and solved problems such as roaming, network efficiency, voice quality, speeds, performance, data delivery along with voice communication etc. While 1G and 2G standards focused more on enhancing voice quality (voice calls) and messaging, 3G and 4G standards focused more on data rates and video streaming (data calls). Thanks to 3G or 4G networks data speeds were significantly increased. In fact, mobile data transmission speed over 4G is 12,000 times faster⁷ than with 2G networks, thus enabling streaming of a 90 mins video in just 90 secs over 4G, as against 72 hrs over 2G. Enhanced disruptive competition in the market has further acted as highly profitable to consumers with some operators having slashed the data rates by more than 60%.⁸

⁵Justus Baron, Kirti Gupta and Brandon Roberts, 'Unpacking 3GPP Standards' (Searle Centre, March 2015) <https://www.law.northwestern.edu/researchfaculty/searlecenter/innovationeconomics/documents/Baron_Gupta_Unpacking_3gpp_Standards.pdf>.

⁶'Global Mobile Subscriber Surpass 7 Billion' (*TeleGeography*, 28 July 2015) <<https://www.telegeography.com/press/press-releases/2015/07/28/global-mobile-subscribers-surpass-7-billion/index.html>> accessed 24 August 2017.

⁷BCG (n 2).

⁸Kalyan Parbat, 'Reliance Jio's aggressive rates to shake up industry: Experts' *Economic Times* (5 September 2016) <http://economictimes.indiatimes.com/articleshow/54009228.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst> accessed 24 August 2017.

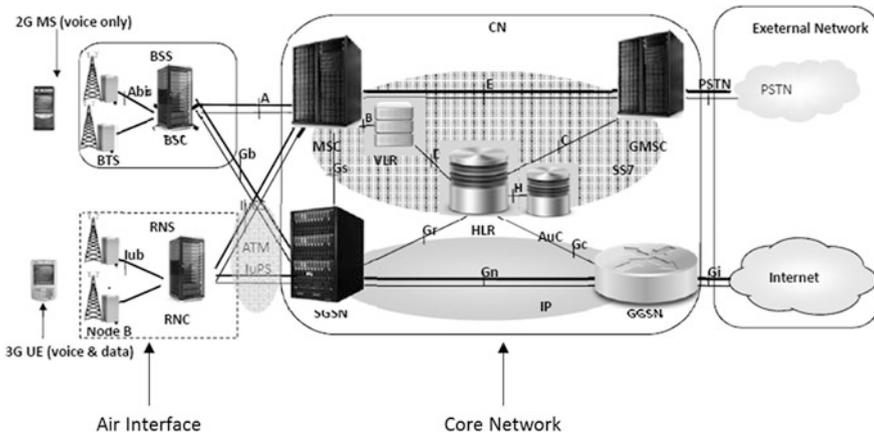


Fig. 1 Cellular network (2G and 3G), Nanocell. (NanoCell Networks Pvt Ltd is an organization with focus on delivering telecom training solutions)

2.1 Complex Telecom System: Air-Interface and Backhaul

We all, as consumers, can use our mobile phones with great convenience. To make this happen, however, there is a complex mesh of networks in the background (also termed as ‘backhaul’), that is set up to take care of varying consumer’s needs.

The figure below offers a glimpse of the variety of components involved to complete a connection that is almost real time (Fig. 1).

The figure above offers some insight into how a voice or a data call (Call) is routed following complex procedures including surpassing unlimited hurdles that fall in the journey of a call such as physical constraints like trees, buildings, thick walls, basements etc.

- a. **An air-interface:** An air-interface refers to establishing a connection between a mobile phone and the Cell Tower (BTS-A base station, that receives and transmits signals),⁹ as shown in below figure where the communication happens over the air (Fig. 2).

This refers to a communication over the air between the handset and the tower (radio access) with the help of radio waves. Allocation of the spectrum (relevant frequency bands) is essential to make this air-interface successful.¹⁰ This radio interface must be fully defined so that there is compatibility between mobile

⁹‘Definition: Base Station’ (*Techtarget*) <<http://whatis.techtarget.com/definition/base-station>> accessed 24 August 2017.

¹⁰As the EC explains ‘[r]adio spectrum is the basis for wireless communications like Wi-Fi or mobile phones, but is also key to areas like transport, broadcasting, public safety, research, environmental protection, and energy’; See European Commission, ‘What is Radio Spectrum Policy?’ <<https://ec.europa.eu/digital-single-market/en/what-radio-spectrum-policy>>.

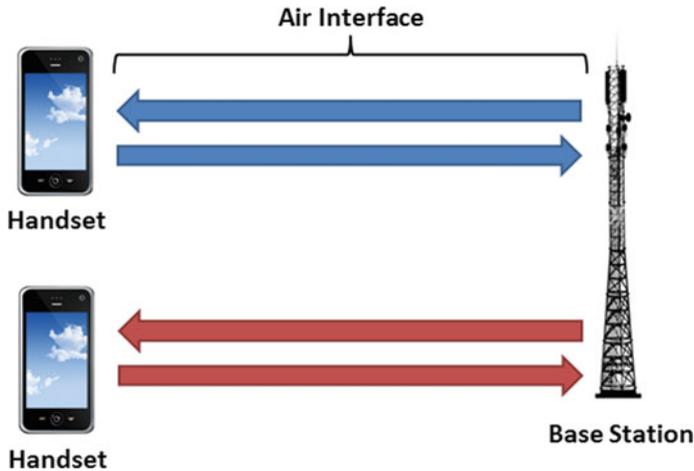


Fig. 2 An air interface

stations and networks. Complex technologies are involved to ensure that networks and handsets from different manufacturers interact with each other in an efficient manner.

- b. **Backhaul (Core Network):** A backhaul¹¹ generally refers to the entire set of multistep processes that is followed to ensure that a call (voice or data¹²) becomes successful. Once the base station receives signals (voice or data calling) from a user, it transmits this data in packets to core network (also known as backhaul) mostly through wired networks¹³ such as ethernet/cables. Once the base station tower sends signals to core networks, it then authenticates the user, passes billing information, data to be transmitted (voice or information), checks what network resources should be allocated to a user such as bandwidth, call routing to a destination etc.

In the backhaul, there are multiple equipments that render important functions, few of those include HLR (Home Location Register), VLR (Visitor Location Register), EIR (Equipment Identity Register), Authentication Centre, GMSC

¹¹'Backhaul Basics, A Definition Network Experts Define Backhaul Networks' (*RCR Wireless News*, 13 May 2014) <<https://www.rcrwireless.com/20140513/network-infrastructure/backhaul-network-definitions-cellular-backhaul-definition>> accessed 24 August 2017.

¹²Data calling includes videos, web browsing, information access etc.

¹³However, maintaining extensive wired network is impossible due to several constraints (processing delays due to multiple relays, environmental challenges such as faced in maintaining sub-marine cables etc.).

(Gateway Mobile Switching Centre), GGSN¹⁴ (Gateway General Packet Radio Service (GPRS)) Support Node, which is like a ‘gatekeeper’ that interconnects between GPRS system and internet), SGSN¹⁵ (Serving GPRS Support Node which authenticates user for voice traffic for GPRS (2G) mobiles) etc.

Few important things that are required for call (data and/or voice) transmission include:

- **Spectrum and Radio frequencies (Broadband)**

To understand it better, consider broadband is like a road/highways/railway tracks and as a vehicle (like an aircraft/car/ship/train) as different Radio frequencies.

- **Data** (voice or information)

As an analogy, consider passengers as ‘Data’ that is carried by over-allocated frequencies (car/aircraft/ship/cycle/train) in the available scarce spectrum (road/tracks/highways). Data can be a voice or information like videos/files etc.

- **Standardized technologies**

Evolution in telecommunication technologies ensures how to best utilize the existing scarce spectrum that is available in nature and is a non-renewable source. As an analogy, technological development increases capacity of a vehicle to carry more passengers. Consider a car that can carry only five passengers (i.e. ‘data’) maximum. Technology enhances the capacity of this car (by making changes in sitting arrangement, or including new seats at the back, joining seats) to now carry more than let’s say, seven passengers. Further, consider that there are many cars carrying set of passengers on road, then the technology will ensure that there is less traffic congestion by building up subways and highways etc.

3 Benefits of Standardization

Globally, only a handful of companies are the major technology contributors to cellular standards, as shown in the graph below, by contributing to the global standardization ecosystem through an open and collaborative innovation framework (Fig. 3).

¹⁴GGSN is a router to subnetworks. GGSN plays a critical role in network protection, security, quality of service (QoS) enforcement, and interaction with charging and billing systems. ‘Cisco GGSN Gateway GPRS Support Node: Connectivity for the UMTS/HSPA Packet Core’ (Cisco, 25 June 2010) <https://www.cisco.com/c/en/us/products/collateral/wireless/asr-5000-series/data_sheet_c78-607120.html> accessed 13 November 2017.

¹⁵It is the service access point for GPRS network and authenticates user for voice data for GPRS mobiles. Once authentication is complete, SGSN registers mobile on GPRS network, ‘SGSN’ (Telecom ABC) <<http://www.telecomabc.com/s/sgsn.html>> accessed 13 November 2017.

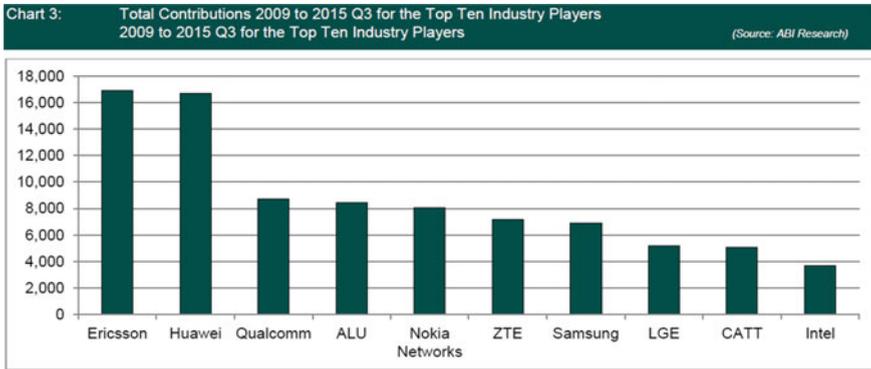


Fig. 3 Total contributions for the top ten industry players (Source All research)

Technology providers voluntarily decide to make standardized patented technologies available and accessible to everyone at FRAND terms and conditions subject to balanced and harmonized IPR policies of Standard Development Organizations (SDOs). Thanks to standardization the telecommunication sector has enabled turn-over of three trillion USD and generated 11 million jobs.¹⁶ At a global scale, standardization has also enabled development of over 2.2 million mobile applications¹⁷; the total number of phone calls made per day is over 10 billion (2013 data)¹⁸; number of text messages sent per day is 18.7 billion (2014 data)¹⁹; data generated per day is 2.5 exabytes or 2.5 quintillion bytes (2016 data)²⁰ and

¹⁶Julio Bezerra and others, 'The Mobile Revolution and How Mobile Technologies Derive Trillion-Dollar Economy' (BCG, 15 January 2015) <https://www.bcgperspectives.com/content/articles/telecommunications_technology_business_transformation_mobile_revolution/>.

¹⁷'Number of apps available in leading app stores as of March 2017' (Statista) <<https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/>>.

¹⁸Roberto Romano, '3 Billion Phone Calls Made in US Every Day' (Texas Insider, 18 June 2013) <<http://www.texasinsider.org/3-billion-phone-calls-made-in-us-every-day/>>.

¹⁹Kenneth Burke, 'How Many Texts Do People Send Every Day?' (Text Request, 18 May 2016) <<https://www.textrequest.com/blog/many-texts-people-send-per-day/>>.

²⁰Mikal Khoso, 'How Much Data is Produced Every Day?' (Level: Northeastern University New Ventures, 13 May 2016) <<http://www.northeastern.edu/levelblog/2016/05/13/how-much-data-produced-every-day/>>; 'How Much Data Does The World Generate Every Minute?' (IFLSCIENCE, 2017) <<http://www.iflscience.com/technology/how-much-data-does-the-world-generate-every-minute/>>.

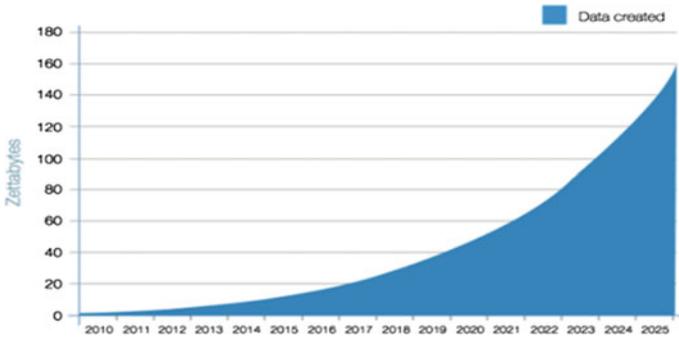


Fig. 4 Forecasted data created per year. (David Reinsel, John Gantz and John Rydning, ‘Data Age 2025: The Evolution of Data to Life-Critical Don’t Focus on Big Data; Focus on the Data That’s Big’ (IDC White Paper, 2017) <<https://www.seagate.com/www-content/our-story/trends/files/Seagate-WP-DataAge2025-March-2017.pdf>>)

e-commerce revenue generates 1.2 million dollars every 30 secs (2015 data).²¹ It is expected that close to 160 zeta bytes of data will be generated by 2025 (Fig. 4).²²

While global standardization and FRAND licensing have been recognized as the reason for this development, unwilling licensees continue to disturb the global standardization framework by indulging in delaying tactics.²³ Such unwilling licensees also gain a competitive advantage over those licensees that are diligently signing up FRAND licensing agreements.

4 Good Faith Negotiations v Hold-out Behavior: Recent Case-Law

Standards allow for open collaborative innovation framework, technology sharing by licensing and increased competition in the market, leading to, high performance interoperable devices, at competitive prices. Thus standards are key to inclusive development for any nation. An efficient and balanced IP regime ensures that innovation cycle and long-term public interest are safeguarded. Thus, worldwide judiciaries and policy makers aim to strike a balance between the need to compensate IP owners on the one hand, and to successfully implement standards on the other.

²¹‘E-commerce Generates \$1.2 million Revenue Every 30 secs: Study’ (*Gadget News*, 19 August 2015) <<http://www.gadgetsnow.com/tech-news/E-commerce-generates-1-2-million-revenue-every-30-secondsStudy/articleshow/48543392.cms>>.

²²‘Total WW Data to Reach 163ZB by 2025: Ten Times More Than Today’ (*Storage Newsletter*, March 2017) <<https://www.storagenewsletter.com/2017/04/05/total-ww-data-to-reach-163-zettabytes-by-2025-idc/>>.

²³Ankit Tyagi and Sheetal Chopra, ‘Standard Essential Patents (SEP’s)—Issues and Challenges in Developing Economies’ (2017) 22 JIPR 121–135.

FRAND is to be determined by the parties in bilateral negotiations. This allows the parties to address the specific circumstance of each individual case. However, when parties cannot agree on FRAND terms, they may end up in court. While there are several aspects surrounding the licensing of SEPs, one of the most important is the need for good faith negotiations²⁴ between parties to arrive at a FRAND licensing agreement. In other words, FRAND licensing is a two-way street,²⁵ where two symmetrical risks, hold-up and hold-out must be considered. Specifically, hold-out refers to an unwilling licensee of a SEP successfully avoiding a license or forcing the SEP holder to accept royalties below FRAND rates by adopting delaying tactics, whereas hold-up refers to an SEP owner extracting royalties above FRAND under the threat of an injunction.²⁶

Hold-out is seen by judicial and academic representatives as equally harmful as hold-up when it comes to negotiations between parties.²⁷ In *Unwired Planet v Huawei*,²⁸ the UK High Court recognized both risks and attempted in its decision to adopt an approach to obviate them. In *Apple v Motorola*,²⁹ dissenting US Federal Circuit Chief Judge Rader defined the terms hold-out v hold-up and commented that hold-out is equally as likely and as disruptive as a hold-up. The practical impact of hold-up and hold-out can, however, significantly vary.

While courts for years have too often focused on patent hold-up, the literature supporting such risk in the context of standards has mostly been theoretical.³⁰ If hold-up would exist the market would have experienced stagnant innovation, rising prices and limited market entry. However, as explained above, the data shows exactly the opposite. Moreover, in relevant markets such as India, China, Europe and US, there is no real threat of injunctions for SEPs for willing licensees. In fact,

²⁴ibid.

²⁵In his post-trial opinion dated 6 August 2013, US District Court Judge Davis noted that initial offers should be viewed as a starting point in the negotiations and that FRAND licensing is a two-way street that requires good faith by both parties, *Ericsson v D-Link*, Memorandum Opinion and Order dated 6 August 2013, Case no. 6:10-CV-473; Court of Justice of the European Union has also enumerated obligations for both, SEP holders and SEP users, to obtain or avoid an injunctive relief respectively. See Case C-170/13 *Huawei Technologies Co. Ltd v ZTE Corp., ZTE Deutschland GmbH* (2017) ECLI:EU:C:2015:477.

²⁶Vincent Angwenyi, 'Hold-up, Hold-out and FRAND: The Quest for Balance' (2017) 12(12) *JIPLP* 1012.

²⁷Some critical academic voices warning about hold-out effects are Gregor Langus, Vilen Lipatov and Damien Neven, 'Standard Essential Patents: Who is Really Holding-up (and when)?' (2013) 9 (2) *Journal of Competition Law & Economics* 253–284; Anne Layne-Farrar, 'Why Patent Hold-out is Not Just a Fancy' (*Competition Policy International*, February 2016); Richard Epstein and KB Noroozi, 'Why Incentives for 'Patent Hold-out' Threaten to Dismantle FRAND, and Why it Matters' (2017) 32 *Berkeley Technology Law Journal* 1381.

²⁸See *Unwired Planet International v Huawei Technologies* (2017) EWHC 711 (Pat).

²⁹*Apple Inc. v Motorola Inc.* (2014) US Court of Appeals for Federal Circuit, 757 F.3d 1286 1333.

³⁰See analysis of lack of evidence supporting hold-up at Anne Layne Farrar, 'Hold-up & Royalty Stacking: Theory & Evidence' (2014) OECD Discussion on Competition, Intellectual Property and Standard Setting.

analyzing the 20 smartphone manufacturers more active in the US from 2000–2012, Gupta and Snyder showed that no single injunction has ever been granted for patents that were determined to be a SEP.³¹ Also a German court has pointed out that ‘it is questionable in principle how much the threat of a claim for injunctive relief can (inadmissibly) affect license agreement negotiations’ since several decisions in Europe ‘could be and can be invoked against inappropriate demands that are in breach of antitrust law’.³²

The situation of hold-out is, however, very different. SEP owners, relying on a FRAND compensation in a timely manner, usually invest heavily in R&D costs *ex-ante*. Thus, the stakes are higher for SEP owners because delayed or no license agreements would mean no ROI. On the other hand, there is often no potential downside for unwilling licensees in case they indulge in hold-out, because an unfavorable court order rendered several years later may result in paying the same royalty fees that they should have otherwise paid.³³ Knowing this, some implementers engage in ‘hold-out’ or ‘reverse hold-up’, by deliberately choosing not to engage in a FRAND license negotiation. Typically, hold-out practices are combined with the challenge of validity and essentiality of SEPs in a court. To avoid the latter, the CJEU has indicated that these challenges must take place in parallel proceedings.

Hold-out, contrary to hold-up, is not a theoretical risk. A recent study by the professors Bowman Heiden and Nicolas Petit³⁴ concludes that patent hold-out is a ‘significant phenomenon’. Despite explosive growth in the global smartphone market (340% growth for smaller entrants in 2011–2015), SEP licensors have experienced a significant reduction in licensing revenue because of delay (44%) and non-payment (39%). In addition, the study documents a dramatic and steady reduction in licensing coverage for this market (from 73% in 2006 to 39% in 2016).

Courts across the world lay considerable weightage to the conduct of both parties during the licensing process in their decisions. The CJEU, for example, in its decision in *Huawei v ZTE* emphasized the need for good faith negotiations, and allowed for injunctive relief for SEPs under certain circumstances: Firstly, the SEP holder must alert the alleged infringer by specifying the patent and the way it has been or is being infringed; secondly, if the alleged infringer has expressed a willingness to conclude a license agreement on FRAND terms, the SEP holder must present a specific, written offer for a license on FRAND terms to the alleged infringer. On the other hand, for the alleged infringer to avoid an injunction it must

³¹Kirti Gupta and Mark Snyder, ‘Smart Phone Litigation and Standard Essential Patents’ (2014) Hoover IP² Working Paper Series No. 14006 <<https://hooverip2.org/working-paper/wp14006/>>.

³²See Case No. 4a O 73/14 *Saint Lawrence v Vodafone* LG Düsseldorf, Judgement dated 31 March 2016.

³³There is no concept of treble or punitive damages in India and hence no potential downside for unwilling licensees.

³⁴Bowman Heiden and N. Petit, ‘Patent Trespass and the Royalty Gap: Exploring the Nature and Impact of ‘Patent Hold-out’’ (2017) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2981577>.

diligently respond in good faith to the offer made by the SEP holder, with an acceptance or a counter offer; and, if the SEP holder rejects the counter offer the standard user must provide appropriate security for the payment of royalties and render accounts for the use of the SEP/s in question.

The determination of good faith in negotiations to avoid injunctions is based on many factors, such as the demonstration of diligence, conduct, timeliness, and willingness to conclude a licensing agreement by both parties. While courts have clarified that the time to declare willingness to conclude a license agreement on FRAND terms depends on the circumstances of each individual case. German courts dealing with large companies considered that five and even three months of delay in negotiating a SEP license showed unwillingness on the part of the licensee.³⁵ Additionally, on the question of a timely counter offer, the German district courts held that six months³⁶ and eighteen months³⁷ after the initial offer were untimely. As a result, an alleged infringer can only raise the FRAND defense, if the counteroffer is made without delay considering the circumstances of the particular case.

Following such reasoning, injunctions have been granted in a few jurisdictions where it was proven that technology users were 'unwilling'. In the *ZTE v Vringo*³⁸ case, the Hague District Court held that ZTE was not a willing licensee. Similarly, the Korean Fair Trade Commission (KFTC) held³⁹ that Apple was not a willing licensee based on a series of reasons: it initiated a patent infringement action against Samsung while negotiations were still underway; it proposed licensing terms that devalued Samsung's patent, and it engaged in reverse hold-up as supported by the fact that it did not intend to pay out any royalties until the litigation was concluded. In the US (*Apple v Motorola*)⁴⁰ the Federal Circuit rejected a per se rule against granting injunctive relief to standard essential patent holders. The FC argued that where an infringer unilaterally refuses a FRAND royalty or unreasonably delays negotiations to the same effect, the patent holder no longer bears singular responsibility for concluding a contract. Thus, the SEP holder should receive in such situations appropriate relief for infringement. In an interim court order the Delhi

³⁵See Case No. 2 O 106/14 *Saint Lawrence v Deutsche Telekom* (2015) LG Mannheim, Judgement dated 27 November 2015; *Saint Lawrence* (n 32); See Case No. 7 O 66/15 *NTT DoCoMo v HTC* (2016) LG Mannheim, Judgement dated 29 January 2016.

³⁶*Saint Lawrence* (n 32).

³⁷*NTT DoCoMo* (n 35).

³⁸Vringo made ZTE an ultimate licensing offer in June 2014, after their request for a customs seizure was accepted. Only a month into the proceedings, did ZTE make a counteroffer to Vringo. The court denied ZTE's claims, stating that ZTE could not be considered a willing licensee under FRAND, Case No. C/09/470109/KG ZA 14-870 *ZTE v Vringo* The Hague District Court, Judgement dated 24 October 2014.

³⁹Korean Fair Trade Commission (KFTC) *Samsung Electronics Co. Ltd.*, Judgement dated 26 February 2014.

⁴⁰*Apple Inc.* (n 29).

High court⁴¹ also highlighted how unwilling licensees continue to infringe on patents and how they entered in delaying tactics by filing a case before the Competition Commission of India (CCI), while the negotiations were still active and ongoing for more than four years.

As can be seen in jurisdictions around the world, there is significant jurisprudence on the conduct of parties, particularly on how to incentivize good faith negotiations between them, penalizing bad faith negotiation.

5 Industry Best Practices and the Role of Injunctions

In the recent debate on FRAND licensing, we are witnessing an increased scrutiny and refusal of consolidated industry practices based on supposedly economic efficiencies. Critics of current licensing best-practices assert that the current licensing framework is no longer fit for the purpose it is meant to serve. Despite the lack of evidence that the current regime is harming competition and consumers, some are questioning practices such as: (i) FRAND-based access to standardized technologies at the end user device level, (ii) valuation methodologies built on comparable agreements and use-based licensing as a function of elasticity of demand and value added by the patented technology, and (iii) negotiations focusing on portfolio license aimed at guaranteeing freedom to operate.

These three claims will be examined in more detail in the following parts, including the role of injunctions in a functioning licensing environment. Anti-patent rhetoric tries to turn market efficiency—where negotiations between a patent owner and an implementer aim at providing freedom to operate in a streamlined and economically efficient fashion—into some sort of unjustified behavior.

5.1 ‘Access for All’ Against ‘License to All’

What happens, if industry practices based on efficiency are subverted, and licenses have to be granted at chip manufacturers level? What is licensed and what is not? As a product manufacturer, do I have freedom to operate? What happens, if a licensed chipset for standard implementation ends up in a competitive, proprietary, non-standard device? These are all valid questions that arise when licensees, policy makers or other stakeholders try to define the Non-Discriminatory (ND) prong of FRAND as an obligation to license across the supply chain, the so-called ‘license to all’⁴², obligation.

⁴¹*Micromax Informatics Limited v Telefonaktiebolaget LM Ericsson (Publ)* (2013) Competition Commission of India, Case 50/2013; *Intex Technologies (India) Limited v Telefonaktiebolaget LM Ericsson (Publ)* (2013) Competition Commission of India, Case 76/2013.

⁴²Various terms are used to describe the concept, including ‘license to all’, ‘refusal to license’, ‘licensing level discrimination’, ‘compulsory licensing’.

Telecommunications standards define the air interface between user equipment and the network. Some inventions may even cover both ends of the interface, i.e. both the user equipment as well as the base station is covered by patent claims in a sender—receiver fashion. The landscape of patent claims covering the standard and the continuous evolution of the standard creates a very dynamic situation. On top of these two moving parts, some features of the standard are mandatory and some are optional, adding even more complexity to how the standard is implemented in fully compliant products.

Economic efficiencies have identified, at least in the mobile industry, the end user device as the suitable attachment point, in order to license one level of the supply chain in a simple, transparent, and cost-effective (for both patent owners and licensees) way. A single license at the device level ensures access to the technology for the whole supply chain. The fact that there is only a single license provides obvious benefits in terms of simplicity and efficiency.

The pace of innovation, that standards based on FRAND and consolidated licensing practices have created, is unprecedented. Also, the competitive level of the mobile industry (with new entrants and falling prices) is a testament to the vitality and dynamism of the ICT sector, and proof of availability and affordability of the technology to all. Consolidated industry practices have facilitated a successful licensing framework that has brought us 2G, 3G and 4G, and which is bringing 5G on an accelerated timeline.

A proposed compulsory 'license to all' obligation for SEPs basically requires a patent holder to grant a license to any party that requests so, regardless of where in the value chain that party operates. Many levels of a value chain price their components based upon manufacturing costs and a slim margin. Thus, industry practice is and has been not to license at the component level, so that such business models do not account or support FRAND royalties. Moreover, efficiency requires a simple licensing regime, ideally with a single patent license allowing access for all in the value chain. A single license at the user device level provides access to the patented technology to all suppliers and component manufacturers upstream.

Conversely, an obligation to license at different levels of the value chain would inevitably result in several inefficiencies, including:

- Licenses at upstream levels would result in patent exhaustion in the downstream market. Since it is not allowed to license the same patent twice in a product, licensing to a chipset manufacturer (upstream) would avoid the license to the smartphone (downstream).
- Licenses granted at component level could result in the patent owner having to negotiate separate licenses with different manufacturers for the same user device. This would inevitably result in inefficiencies and complexity, leading to increased costs for both licensor and licensees and, ultimately, higher prices for consumers.
- Licenses at upstream levels could easily result in licenses to components which end up in non-standardized products or in products built to competing standards.
- Licenses would be granted at a level which does not support FRAND royalties.

- Licenses could be granted at a level which does not provide effective reciprocity for the licensor and the licensee, which is a key element to protect FRAND licensors.

5.2 *Use-Based Licensing v Smallest Saleable Patent Practicing Unit (SSPPU)*

There is a fundamental difference between value and cost. Economists conceive innovation as a productivity improvement from an increase in capital—that is, the incremental value that the patented invention adds to the end product. It is, thus, impossible to properly express the economic effect of an innovation without reference to the product price and to the quantities of other inputs available for production.

Royalties follow market-based price elasticity of demand. They reflect the price a consumer is willing to pay for the features enabled by the technology, and different verticals exhibit different elasticity and willingness to pay for the technology (for example, the value of cellular technology on a car is much higher than on a smart meter). Several approaches can be utilized to determine the value of a new technology, for instance the upcoming 5G, and the associated aggregate royalty level before any comparable licenses exist.⁴³ For example, with respect to 5G, the following methodologies can be used:

- Valuing expected technical benefits of 5G over prior standard generations;
- Analyzing studies and court decisions regarding 4G royalty stack;
- Mobile device pricing comparison.

As argued by scholars and judges alike, the value of a book does not equal the cost of the paper. The value of a technology has nothing to do with the cost of a component. The value added to the user (and to the manufacturer, in this IoT era) should guide valuation. Focusing on cost is a short-term, short-sighted strategy that goes against the very principle of patent law. i.e., guaranteeing investments in future innovation. Antitrust is inevitably focusing on the present, while patent law focuses on the future.

Static efficiency (the now) is not always the right framework to analyze patent cases. Dynamic efficiency (the future), on the other hand accepts, for example, that monopolist positions now can lead to increased investments and innovation in the future. And yet a patent is hardly a monopoly. ‘At best, a patent gives one the opportunity to charge monopoly profits. [...] Furthermore, others are allowed to

⁴³David Kennedy and Larry Tedesco, ‘5G SEPs—How Can Early Implementers Predict Aggregate Royalties?’ (*iam*, 2018) <<http://www.iam-media.com/Intelligence/IAM-Yearbook/2018/Country-by-country/5G-SEPs-how-can-early-implementers-predict-aggregate-royalties>>.

improve the product and block the original patent owner'. This is especially true for (F)RAND assured essential patent.

5.3 *Portfolio as Welfare Enhancing*

Consolidated industry practices are generally based on portfolio licenses that cover all essential patents by the licensor for a specific standardized technology and in a specific field of use. This approach guarantees freedom to operate for licensees in said field of use.

Some potential licensees, often to stall or delay negotiations, are suggesting a lengthy patent-by-patent negotiation, and often argue over validity, infringement and value for each patent. This behavior has become more and more prevalent. This is true, particularly in the developing world, but also increasingly in the developed world. Incidentally, the new patent policy by the Institute of Electrical and Electronics Engineers (IEEE),⁴⁴ has led to a huge decrease of willingness to license under such policy.⁴⁵ IEEE policy recommends that negotiations, and possibly adjudication proceedings, follow precisely a patent-by-patent approach.⁴⁶

When faced with litigation, to delay or stall negotiations, some unwilling licensees are increasingly requesting the court to determine FRAND royalties based on the patents in suit instead of the whole portfolio, and only for the coverage of the

⁴⁴IEEE-SA Standards Board Bylaws <<http://standards.ieee.org/develop/policies/bylaws/Sect6-7.html>>.

⁴⁵According to Mallinson, following the adoption of the new IPR Policy favoring standard users' position:

almost three quarters (i.e. 73%) of LOAs [Letters of Assurance] for the IEEE flagship 802.11 WiFi standard, accepted by IEEE and posted on its website in the 18-month period to June 2017, are 'negative' LOAs, indicating the submitter's legitimate ex ante refusal to pledge [F]RAND licensing under the new patent policy. Nearly half (i.e. 47%) of all accepted LOAs posted on the IEEE website over the same period are negative LOAs. More than one third (i.e. 42%) of companies portrayed as leaders with LOAs to IEEE standards are unwilling to pledge their SEPs under the new patent policy or have not provided LOAs when asked to do so.

See Keith Mallinson, 'Development of Innovative New Standards Jeopardized by IEEE Patent Policy' (*4iPCouncil*, September 2017) <http://www.4ipcouncil.com/application/files/6015/0479/2147/Mallinson_IEEE_LOA_report.pdf>.

⁴⁶The IEEE, through a process that did not seek consensus among participants but instead was conducted with a lack of transparency, decided to substantially change its patent policy in 2015. The new policy favors certain business models and devalues the technologies developed and contributed by several technology providers that rely on licensing to foster further R&D and participation. Keith Mallinson and Wise Harbor describes some of the most controversial changes that the new policy introduced, highlight significant side effects to the whole industry, and looks at some specific facts that demonstrates the negative impact of the policy on participation to the standardization efforts. Mallinson (n 45).

country where the suit takes place. This is what has been called a patent-by-patent strategy, which would force SEP holders to choose between endless litigation or agreeing to royalties that are below FRAND. Such conduct has been qualified as ‘unfair’ in Europe,⁴⁷ where courts have recognized that worldwide portfolio licensing is a well-established industry practice.⁴⁸ Moreover, in some courts an unwilling licensee could face an injunction if it is infringing worldwide patents that are essential to a particular standard.⁴⁹

5.4 The Role of Injunctions

As the acting Chair of the Federal Trade Commission (FTC), Maureen Ohlhausen has recently argued that:

The cost of an overbroad antitrust rule in the standard-setting space—one that effectively prevents SEP owners from even asking for injunctions—is hold-out and patentee under-compensation. That is a danger that antitrust agencies have overlooked.⁵⁰

Without deterring factors, or at least the threat of it, SEP users unwilling to get a license would gain considerable advantage *vis-à-vis* the competition by freeriding. Injunction is a tool to avoid such behavior. Free riders not only use technologies developed by others without retribution, hence limiting the developers’ ROI, but they are also unfair to their competitors. By paying no royalty, they can price their products, for instance mobile phones, below those manufactured by competitors. Ultimately innovation will suffer and the market may fail.

We should note that a voluntary FRAND commitment cannot become a compulsory license scheme that violates the very principle of patent rights as well as international trade agreements. This has been supported by antitrust agencies. For instance, the US Department of Justice (DOJ) Assistant Attorney General (AAG) Makan Delrahim recently delivered speech at the University of Southern California (USC).⁵¹ Delrahim made it abundantly clear that patent holders have the right to enforce their patents and that a FRAND commitment cannot be unilaterally used to violate such right:

⁴⁷*Saint Lawrence* (n 32).

⁴⁸Case 29437/3/2015 *Vringo v ZTE* (2015) Bucharest Court of Appeal 4th Civil Division, Judgement dated 28 October 2015; Case No. 7 O 97/14 LG Mannheim, Judgement dated 4 March 2016. *Saint Lawrence* (n 32); *ibid*; *Unwired Planet* (n 28) 157.

⁴⁹*Unwired Planet* (n 28) 97.

⁵⁰Maureen K Ohlhausen, ‘The Elusive Role Of Competition In The Standard-Setting Antitrust Debate’ (2017) 20 *Stan. Tech. L. Rev.* 93.

⁵¹Department of Justice, ‘Assistant Attorney General Makan Delrahim Delivers Remarks at the USC Gould School of Law’s Center for Transnational Law and Business Conference’ (*The United States Department of Justice*, 10 November 2017) <<https://www.justice.gov/opa/speech/assistant-attorney-general-makan-delrahim-delivers-remarks-usc-gould-school-laws-center>>.

The enforcement of valid patent rights should not be a violation of antitrust law. A patent holder cannot violate the antitrust laws by properly exercising the rights patents confer, such as seeking an injunction or refusing to license such a patent. [...] We should not transform commitments to license on FRAND terms into a compulsory licensing scheme. Indeed, we have had strong policies against compulsory licensing, which effectively devalues intellectual property rights, including in most of our trade agreements, such as the TRIPS agreement of the WTO. If an SSO [Standards Setting Organization] requires innovators to submit to such a scheme as a condition for inclusion in a standard, we should view the SSO's rule and the process leading to it with suspicion, and certainly not condemn the use of such injunctive relief as an antitrust violation where a contract remedy is perfectly adequate.

Delrahim's speech also signals a significant shift in the approach the DOJ has had towards certain SDOs, most notably the IEEE. Delrahim encourages SDOs to maintain internal antitrust compliance programs to monitor whether their policies are or may become anticompetitive.

5.5 *Enhanced Damages for Unwilling Licensees*

Recent court cases, especially the CJEU decision in *Huawei v ZTE*, have helped determining a framework to identify good-faith negotiation tactics *vis-à-vis* abusive behavior or unwillingness. On the contrary, other court cases⁵² have failed to determine appropriate remedies when faced with an unwilling licensee, and have often erred by focusing excessively on possible abuses or discriminatory behavior by the licensor.⁵³

As Wong-Ervin explains:

[I]n the case of an infringer who is engaged in hold-up or hold-out, enhanced damages may be appropriate and necessary to deter such conduct and adequately compensate the SEP holder. Indeed, if the worst penalty a SEP infringer faces is merely paying, after an adjudication, the FRAND royalty it should have agreed to pay when first asked, then hold-up and hold-out give implementers a profitable way to defer payment.⁵⁴

⁵²See for example *Unwired Planet* (n 28); *TCL Mobile Limited, and TCT Mobile v Telefonaktiebolaget LM Ericsson* (2018) District Court for the Central District of California, Case No. 8:14-CV-00341-JVS-DFM.

⁵³Alexander Galetovic and Stephen Haber, 'The Fallacies of Patent Hold-up Theory' (2016) Hoover IP² Working Paper No. 16009 <<http://hooverip2.org/working-paper/wp16009/>>. The debate around FRAND licensing has put an unreasonable weight on combating the hold-up problem (which has been demonstrated to be relatively nuance and non-systemic) while condoning hold-outs and efficient infringement (for a discussion on 'efficient infringement'); See, for example, Gene Quinn, 'A Patent Owner Defending Property Rights is not a Bully' (*IPwatchdog*, 16 December 2015) <<http://www.ipwatchdog.com/2015/12/16/patent-owner-defending-property-rights-not-bully/id=63900/>>. Quinn points out to a real problem that is threatening the ICT industry.

⁵⁴Anne Layne-Farrar and Koren Wong-Ervin, 'Methodologies for Calculating FRAND Damages: An Economic and Comparative Analysis of the Case Law from China, the European Union, India, and the United States' (2017) 8(2) *Jindal Global Law School Law Review* 127.

6 Royalty Stacking—A Unicorn that Does not Exist

SEPs have been instrumental in the growth of the global telephony market and the revenue and jobs generated from it across the world. Royalty stacking appears when the cumulative royalty rate for all SEPs needed to manufacture a smartphone is unaffordable. According to their proponents due to the large number of SEPs contained in a smartphone the cumulative royalty rate for such a device could easily achieve royalty stacking, even if the SEP holders would request separately a FRAND rate.

As already pointed out, FRAND licensing has given a substantial lift to the entry and growth of businesses across the world, and this can be seen from the fact that profits have tripled⁵⁵ from 2007 to 2013. Consumer adoption of 3G and 4G standards has outpaced that of all other technologies, growing to nearly three billion connections in less than 15 years, and projected to exceed eight billion connections by 2020.⁵⁶ India has also seen a phenomenal growth of its handset manufacturing business, as can be seen in the graph below. The net worth of the Indian handset-manufacturing sector grew 115%, going from INR 45,000 crores (6.9 billion USD) in 2014 to INR 97,000 crores (15 billion USD) in 2016 (Fig. 5).⁵⁷

The fact that royalty stacking is theoretical has also been acknowledged in the *Ericsson v D-Link* case by the US Federal Circuit court. In this case,⁵⁸ defendants brought up royalty stacking as being a problem, but ultimately failed to convince the court of any real evidence of harmful stacking. In the appeal proceedings, when the defendants claimed that the Chief Judge Davis had failed to inform the jury to make consideration for the possibility of patent hold-up and royalty stacking, the Federal Circuit court found that Chief Judge Davis did not have a responsibility to do that, since no empirical evidence of that conjecture existed.⁵⁹ In this particular case, sound scepticism to alleged stacking problems was clearly expressed by the court.

⁵⁵Richard J Stark, 'Debunking the Smallest Saleable Unit Theory' (2015) 2 CPI Antitrust Chronicle 2–10. Stark states that 'the size of the handset market has greatly expanded, as global revenues have doubled in the last six years. According to Credit Suisse, handset manufacturer operating profits tripled between 2007 and 2013, reaching US \$51 billion'.

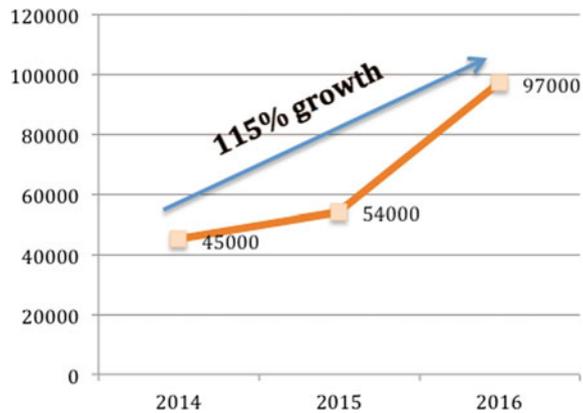
⁵⁶BCG (n 2).

⁵⁷Karan Kashyap, 'Here's How India Is Becoming A Hub For Smartphone Manufacturing In South Asia' (*Forbes*, 22 February 2017) <<https://www.forbes.com/sites/krnkashyap/2017/02/22/heres-how-india-is-becoming-a-hub-for-smartphone-manufacturing-in-south-asia/#4c2827923be8>>.

⁵⁸*Ericsson, Inc. v D-Link Sys., Inc.* (2014) US Court of Appeals for the Federal Circuit, 773 F. 3d 1201, 1225–29.

⁵⁹ibid 1235.

Fig. 5 Net worth of the Indian handset manufacturing business. (Karan Kashyap, 'Here's How India Is Becoming A Hub For Smartphone Manufacturing In South Asia' (*Forbes*, 22 February 2017) <<https://www.forbes.com/sites/krnkashyap/2017/02/22/heres-how-india-is-becoming-a-hub-for-smartphone-manufacturing-in-south-asia/#4c2827923be8>>)



Several research reports have proven that the global aggregate royalty rate for mobile handsets has been reasonable. This is also reflected by growing competition with more than hundred brands selling their phones through both online and offline sales.⁶⁰ A report by Keith Mallison clearly establishes that the '[c]umulative mobile Standard Essential Patents-royalty payments as no more than around 5% of mobile handset sales'.⁶¹ Haber states that the global royalty yield as a percentage of the average sales price have been less than 3.5%.⁶²

A study of the smartphone industry in India has shown trends like those that have been seen across the world, debunking the myth, that *royalty stacking* has caused enormous pressure on businesses in India. The assumption that excessive royalty payments are made leading to increased prices of telecom equipment,⁶³ is not correct considering the annual reports of companies submitted to the Ministry of Corporate Affairs (MCA),⁶⁴ which clearly show that royalty payments are not at all problematic.

The MCA filings made by 19 telecom equipment manufacturing companies,⁶⁵ which can be seen in the table below, reveal that for the fiscal year 2015–16, at least

⁶⁰Tyagi (n 23).

⁶¹Keith Mallinson, 'Smartphone Revolution' *IEEE Consumer Electronics Magazine* (April 2015) 60.

⁶²Galetovic (n 53); Alexander Galetovic, Stephen Haber and Ross Levine, 'An Empirical Examination of Patent Hold-up' (2015) 11 (3) *Journal of Competition Law & Economics* 549. Keith Mallinson, 'Cumulative Mobile-SEP Royalty Payments no More Than Around 5% of Mobile Handset Revenues' (*IP Finance*, August 2015) <<http://www.ip.finance/2015/08/cumulative-mobile-sep-royalty-payments.html>>.

⁶³Telecom Regulatory Authority of India (TRAI) highlights that the telecom equipment manufacturers expend large amounts on royalty payments. TRAI, 'Consultation Paper on Promoting Local Telecom Equipment Manufacturing' (New Delhi, 18 September 2017).

⁶⁴Available from the Ministry of Corporate Affairs (MCA) website.

⁶⁵These 19 telecom equipment manufacturing companies were selected on the basis of market capitalization. Annual submissions made by these companies to MCA reveals following data:

14 of the 19 companies showed zero expenditure on royalty payments. The annual returns of an additional four were unavailable on the MCA website. Only two companies (MYMO wireless and Nelco) showed royalty payments made on their financials. Nelco made the payments to Centre for Development of Telematics (CDOT). This data shows that the issue of royalty stacking is irrelevant, as far as the telecom equipment manufacturers are concerned (Table 1).

Additionally, there is an assumption that handset manufacturers pay excessive amounts in royalty payments. Looking at the companies' annual returns filed with the MCA⁶⁶ one can see that seven large handset manufacturers,⁶⁷ made no royalty payments from FY11–12 to FY14–15, except for Micromax, which made royalty 'provisions'⁶⁸ (not payments). This data shows that the assumption that royalty payments are driving up the costs of manufacturing for handset manufacturers is not correct (Table 2).

The entry of new Indian businesses into the market as well as their exponential market growth is a clear evidence of the fact that there is no systemic abuse. There has not been any appreciable adverse effect on competition, as the market has more players than ever before. The astronomical growth of the Indian handset-manufacturing sector shows that companies have the capability to pay for reasonable royalties. However, their willingness to pay for it seems to be lacking despite how essential IPR is to development of new technologies.

7 Price Differentiation and Economic Efficiencies

Charging different prices for the same product or service is defined in economic literature as price discrimination. It has been argued by a few that the non-discriminatory part of a FRAND commitment implies that a patent owner should offer the same licensing rates for the same standardized technology to all licensees.⁶⁹ Although at a first glance, this may sound logical, such assertion

Tejas Networks (which has a license for optical technologies from CDOT) paid Rs. 0.15 crores (0.036% of the total revenue) in 2013–14 and Rs. 0.09 crores (0.022% of the total revenue) in 2014–15, and Nelco paid Rs. 1153 lacs (to CDOT) (8.324% of the total revenue) in 2015–16. For FY 2015–16.

⁶⁶MCA (n 64).

⁶⁷The seven companies referred to above are—Celkon, Intex Technologies, Karbonn, Lava International, Maxx Mobiles, Micromax Informatics, and Spice Digital.

⁶⁸Micromax made provisions for royalty in FY13–14 (Rs. 1500 million) and FY14–15 (Rs. 1092.41 million) according to the annual returns filed with MCA.

⁶⁹See Fair Standards Alliance <<http://www.fair-standards.org/>>.

Table 1 Data synthesized from annual reports submitted by the companies to MCA (Ministry of Corporate Affairs)

S. No.	Name of company	Royalty payments made during FY2015–16
1	Tejas Networks	NA ^a (Rs. 0.09 crs. in FY 14–15)
2	MYMO Wireless	4.9 lacs
3	Saankhya Labs	NA
4	Vihaan Networks	NA
5	Coral Communications	NA (Rs. 0.00 in FY14–15)
6	Bharti Infratel Ltd.	0
7	Honeywell Automation India Ltd.	0
8	Nelco	Rs. 1153 lacs (to DOT)
9	Astra Microwave Products Ltd.	0
10	MIC Electronics Ltd.	0
11	Aishwarya Tech. and Telecom Ltd.	0
12	GTL Ltd.	0
13	Punjab Communications Ltd.	0
14	Valient Communications Ltd.	0
15	Precision Electronics Ltd.	0
16	HFCL	0
17	ITI Ltd.	0
18	GTL Infrastructure Ltd.	0
19	Aplab Ltd.	0

These 19 telecom equipment manufacturing companies were selected on the basis of market capitalization. Annual submissions made by these companies to MCA reveals following data: Tejas Networks (which has a license for optical technologies from CDOT) paid Rs. 0.15 crores (0.036% of the total revenue) in 2013–14 and Rs. 0.09 crores (0.022% of the total revenue) in 2014–15, and Nelco paid Rs. 1153 lacs (to CDOT) (8.324% of the total revenue) in 2015–16. For FY 2015–16

^aRoyalty payments made by Tejas Networks to CDOT in year 14–15

Table 2 Data synthesized from annual reports submitted by the companies to MCA (Ministry of Corporate Affairs)

Manufacturer	FY 11–12	FY 12–13	FY 13–14	FY 14–15
Celkon	0	0	0	0
Intex Technologies	0	0	0	0
Karbons	NA	NA	0	0
Lava International	0	NA	0	0
Maxx Mobile	0	0		NA
Micromax Informatics	0	NA	1500 (millions of INR)	1092.41 (millions of INR)
Spice Digital	0	0	0	0

Annual reports available at MCA (Ministry of Corporate Affairs) website

contradicts decades of successful licensing practices and it goes against basic economic principles.⁷⁰

Economic literature has demonstrated that price differentiation can increase efficiency, increase output, promote investments in innovation and improve consumer welfare.⁷¹ Under some circumstances, by charging a unique price to a unique customer, or different prices to different groups of customers, output increases and markets become entirely efficient, even in the presence of market power.⁷²

Price differentiation is common in most industries and sectors. For instance, movie theaters offer discounted tickets to students in off-peak hours to spread fixed costs among a larger users base; airlines charge different prices for very similar seats and identical services according to complex algorithms that account for a lot of parameters such as seat availability and customer willingness to pay; game console manufacturers often price consoles below market price to attract a larger community and differentiate on the price of games; and software developers sometimes decide to release code for free charging different prices to different customers for added services or maintenance. Ultimately, price discrimination reflects the fundamental economic principle of demand elasticity: the price of a specific service, product or technology is a function of the actual and perceived surplus by the user and its willingness to pay for that service, product or technology.

The concept of price differentiation in technology licensing is particularly important as it applies to IoT, where the use of the technology, the associated requirements and ultimately the value added by said technology will differ widely from one vertical to another. In the IoT, an estimated of 25 billion devices will be connected by 2020. Cellular standards in the IoT will be incorporated in non-ICT sectors such as agriculture, banking and finance, maritime trade, and transportation.⁷³ These sectors, not familiar with licensing in the ICT sector would benefit from a transparent licensing platform, which reflects in its licensing the value that the standardized technology brings to the end product. In an effort to achieve broad dissemination of IoT in a fair manner, Ericsson and other major contributors of cellular technology have created an independent industry patent licensing platform for IoT called Avanci.⁷⁴ Avanci is a one-of-a-kind platform designed to efficiently and predictably license standard essential patents for the cellular standards to all of

⁷⁰It should be noted that it is also discriminatory to charge the same price to costumers when costs differ, Anne Layne-Farrar, 'Nondiscriminatory Pricing, Is Standard Setting Different?' (2010) 6(4) Journal of Competition Law & Economics 811.

⁷¹ibid.

⁷²Lars Stole, 'Price Discrimination and Competition' in Mark Armstrong and Robert (eds), *Handbook of Industrial Organization* vol. 3 (Elsevier 2007).

⁷³Haris Tsilikas and Claudia Tapia, 'The Internet of Things: Big Data, New Patent Licensing Models and the Role of Standardization' (*The Patent Lawyer*, 2018).

⁷⁴Avanci <<http://avanci.com/>>.

the industries and products that exist and will be created in the IoT. It provides manufacturers of connected products with an open and streamlined way to license essential wireless technology, making it possible for companies to access all the technology they need with a single license for a flat fee per unit.⁷⁵ At the same time, it enables the companies and research institutions that create this technology to recoup their significant investments in R&D.

The concept and motivation behind Avanci recognizes the challenges when products uses and capabilities differ. For instance, fully autonomous vehicles require consistent and high-bandwidth coverage, where data transfer occurs in milliseconds (i.e. low latency). The quality of service in terms of speed and volume needs to be very high. However, other vertical uses and devices like smart meters are far less demanding. Therefore, Avanci is an example of the advantages and fairness of price differentiation. Such differentiation, based on the elasticity of different verticals and the contribution of the technology to the end user device, reflects the value of the technology to end users.

A market-driven, efficiency-enhancing and industry-led approach to licensing in the IoT will achieve a win-win solution for technology users, technology developers and consumers. The cost of the license will strike the optimal tradeoff between market adoption and a fair return to those who are developing the technology. 4G evolution and 5G will introduce connectivity in new use products beyond the traditional uses. This is projected to unlock tremendous value and create benefits for new industries and their consumers.⁷⁶ As explained above, those products or services enjoying a higher value from patented 5G connectivity, e.g. remote surgery, autonomous vehicles, industrial real-time applications, will pay a higher royalty than those with strict performance requirements that consequently are not using some of the features in the 5G specification, such as simple sensors.

Contrary to this market-led approach based on price differentiation, setting the same price for a technology across verticals would inevitably result in inefficiencies. If innovators were forced to price 5G equally across different applications irrespective of the value added of the technology, that price would result to be too high for some players, e.g. smart meters, forcing manufacturers not to incorporate such innovative technology. On the other hand, autonomous vehicles would pay far less than what consumers are willing to pay and are currently paying to automotive industry.

⁷⁵For example, for connected cars Avanci offers its large SEPs' portfolio for USD 3 for eCall, USD 9 for eCall, 2G and 3G, and USD 15 for eCall and 2G to 4G per vehicle, Pricing <<http://avanci.com/pricing/>>.

⁷⁶McKinsey Global Institute, 'The Internet of Things: Mapping the Value Beyond the Hype' (2015) <<https://www.mckinsey.com/~media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/The%20Internet%20of%20Things%20The%20value%20of%20digitizing%20the%20physical%20world/The-Internet-of-things-Mapping-the-value-beyond-the-hype.ashx>>.

Under this background it is important to resist lobbying initiatives led by groups of implementers, in favor of charging the same price for a standardized technology independently of the value it brings to the end product. Naturally, some legal scholars have investigated the risks associated with ‘buyers’ cartels’ in the context of SDOs, and their effects on innovation and R&D investments. Lo Bue,⁷⁷ in an analysis of possible antitrust concerns related to the new IEEE patent policy,⁷⁸ states that:

[t]he purchasers of technology aim to achieve different objectives compared to SEP holders. Indeed, they want to lower the royalty fees under which access to the standard-essential technology is granted and lobby heavily to reach this goal. Purchasers of technology have strongly campaigned over the years in favour of clearer policies which help to define what FRAND terms are, and they seem to have accomplished their mission on February 9, 2015.

Delrahim also warns against the so-called monopsony effect:

[E]nforcers should carefully examine and recognize the risk that SSO participants might engage in a form of buyer’s cartel, what economists call a monopsony effect. [...] I therefore urge antitrust enforcers [...] to take a fresh look at concerted actions within SSOs that cause competitive harm to the dynamic innovation process.⁷⁹

8 Antitrust Considerations

The US antitrust agencies have widely acknowledged industry standards ‘to be one of the engines driving the modern economy’⁸⁰ and that:

[s]tandards can make products less costly for firms to produce and more valuable to consumers. They can increase innovation, efficiency, and consumer choice; foster public health and safety; and serve as a ‘fundamental building block for international trade. Standards make networks, such as the Internet and wireless telecommunications, more valuable by allowing products to interoperate.’⁸¹

Similarly, antitrust enforcers have explained that:

⁷⁷Marco Lo Bue, ‘Patent Hold-up and Hold-out Under the New IEEE’s IP Policy: Are These Breaches of Competition Law?’ (2016) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2885364>.

⁷⁸IEEE-SA Standards Board Bylaws (n 44).

⁷⁹Department of Justice (n 51).

⁸⁰Department Of Justice and Federal Trade Commission, ‘Antitrust Enforcement And Intellectual Property Rights: Promoting Innovation And Competition’ (2007) 33 <<https://www.ftc.gov/sites/default/files/documents/reports/antitrust-enforcement-and-intellectual-property-rights-promoting-innovation-and-competition-report.s.department-justice-and-federal-trade-commission/p040101promotininnovationandcompetitionrpt0704.pdf>>.

⁸¹ibid.

[t]he justification for cooperatively setting a standard, as opposed to letting standards develop accidentally or from the technological solutions proposed by individual firms, is that collaboratively-set standards can be more useful to society. In the long run, they may provide a more optimal balance of choosing more advanced technology, costing less to create and implement, and getting to market faster.⁸²

The agencies have also recognized that antitrust issues may arise from collaborative standard [development] when standards incorporate technologies that are protected by IPRs. Such issues could involve the perceived potential for ‘hold-up’ by contributors of technology to standards after the standard has been finalized.⁸³ However, multiple data points over the past 22 years, including from the antitrust agencies themselves, have suggested that such issues are a rare exception, rather than a systemic problem. This part reviews some of these data points.

First, the agencies themselves have recognized multiple market-based factors that may mitigate the risk of hold-up, including the following:

[P]atent holders that are frequent participants in standard-setting activities may incur reputational and business costs that could be sufficiently large to deter fraudulent behavior. Patent holders may also enjoy a first-mover advantage if its technology is adopted as the standard.

As a result, patent holders who manufacture products using the standardized technology:

may find it more profitable to offer attractive licensing terms in order to promote the adoption of the product using the standard, increasing demand for its product rather than extracting high royalties.

Finally, the agencies have recognized that patent holders that have broad cross-licensing agreements with the SEP-owner may be protected from hold-up.⁸⁴

Second, multiple market players have provided public comments to US antitrust agencies, explaining that collaborative industry standards assured through FRAND assurances generally worked well. In response to a 2011 FTC workshop on patents in standards, dozens of companies and experts have made this point.⁸⁵ To take two examples of these, Intel Corporation has explained that:

⁸²ibid. Hill Wellford, [then] Counsel to the Assistant Attorney General, Antitrust Division, US Department of Justice Antitrust Issues in Standard-Setting.

⁸³ibid.

⁸⁴Federal Trade Commission, ‘Prepared Statement of The Federal Trade Commission Before the United States Senate Committee on the Judiciary Subcommittee on Antitrust, Competition Policy and Consumer Rights Concerning ‘Standard Essential Patent Disputes and Antitrust Law’ (Washington, D.C., 30 July 2013) 6. <https://www.ftc.gov/sites/default/files/documents/public_statements/prepared-statement-federal-trade-commission-concerning-standard-essential-patent-disputes-and/130730standarlessentialpatents.pdf>.

⁸⁵Federal Trade Commission, ‘#382: FTC Issues Agenda for Workshop to Explore the Role of Patented Technology in Collaborative Industry Standards; FTC Project No. P111204’ (2011) <<https://www.ftc.gov/policy/public-comments/2013/08/initiative-382>>.

the evidence shows that standard-setting processes generally work well. Thousands of standards are developed every year, generally without incident, and they are normally followed by significant price drops year after year in almost all industry sectors where standards are used. Intel is unaware of any systemic problems of patentees misleading standard-setting organizations (SSOs) or refusing to abide by previous licensing commitments made to those organizations, including commitments to license on reasonable and nondiscriminatory (RAND) terms. To be sure, a few well-publicized disputes have arisen, but they have been the rare exception to the general rule.⁸⁶

Microsoft has explained that:

[t]here are literally thousands of ICT standards in existence today. Hundreds of these standards have been referenced in eGovernment Interoperability Frameworks, with no apparent documented problems relating to IPR issues. There have been a relatively small number of noteworthy litigations that have been commenced when two parties have been unable to agree on whether proffered licensing terms were RAND and/or otherwise met the requirements of the applicable SSO's IPR policy. These are very much the exception, not the rule.⁸⁷

Finally, and perhaps most importantly, the US antitrust agencies enforcement record demonstrates that there has not been a single instance of an antitrust violation resulting from hold-up. This includes a three-year period between 2012–2015, when the Division showed special advocacy interest in this area.

The FTC did bring seven enforcement matters in this area, in the twenty-two years between 1995–2017. However, thus far it has never won such a case in litigation. All these cases were settled by the FTC, a few of them under the parallel pressures of a pending merger. Only one matter, the Rambus case, was fully litigated, ending in a loss for the FTC. See table summarizing these cases (Table 3).

To summarize, US antitrust agencies and industry have both recognized that hold-up is an exception, not a systemic problem. The agencies' interest in standard development cases to date has not translated into any successfully litigated antitrust cases.

Finally, we would be remiss without reminding that Makan Delrahim, who assumed his role in the fall of 2017, appears to take a keen interest in standard development issues. His concern appears to be mostly with collaborative violations. In a seminal 10 November 2017 speech, AAG Delrahim detailed his views in this area,⁸⁸ that can be summarized as follows:

⁸⁶Earl Nied, 'Intel Corporation's Response to the Commission's Request for Comments in Connection with Its Patent Standards Workshop, Project No. P11-1204' (5 August 2011) <https://www.ftc.gov/sites/default/files/documents/public_comments/request-comments-and-announcement-workshop-standard-setting-issues-project-no.p111204-00042/00042-80174.pdf>.

⁸⁷David Heiner, 'Microsoft comments in connection with Federal Trade Commission Workshop on Standard-Setting Issues, Project No. P111204' (14 June 2011) <<https://www.ftc.gov/policy/public-comments/comment-00009-28>>.

⁸⁸Makan Delrahim, Assistant Attorney General, 'Take It To The Limit: Respecting Innovation Incentives In The Application Of Antitrust Law' (Speech at the USC Gould School of Law, 10 November 2017) <<https://www.justice.gov/opa/speech/file/1010746/download>>.

Table 3 Enforcement actions by FTC

Matter	Year	Decision type	FTC vote	Alleged conduct and theory
Dell	1995/ 1996	Consent	4-1	Deception/Disc. violation Section 5 FTC Act
Rambus	2002/ 2008	Litigated and lost	5-0	Deception/Disc. violation Section 2 Sherman Act
Unocal	2003/ 2005	Consent (merger)	5-0	Deception/Disc. violation Section 2 Sherman Act; Section 5 FTC Act
N-Data	2008	Consent	3-2	Breach of licensing commitment and transfer issue Section 5 FTC Act
Bosch/ SPX	2012	Consent (merger)	3-2	Breach of licensing commitment (abandoned) Section 5 FTC Act
Google/ MMI	2013	Consent (merger)	2-1-1	Breach of licensing commitment Section 5 FTC Act
Qualcomm	2017	–	–	Section 2 Sherman Act

- FRAND commitment is not a compulsory licensing scheme. There is no duty to license SEP.
- Hold-out is a more serious antitrust risk than hold-up.
- Collective hold-out (reverse hold-up) is a more serious impediment to innovation and is now a DOJ priority.
- Enforcement of patents, whether essential to a standard or not, including through seeking an injunction, is not an antitrust violation.
- Violation of a FRAND commitment is not an antitrust violation and should be dealt with through contract law.
- Patents are a form of property, and the right to exclude is at their core.
- Risk of technology-buyers' cartel in SDOs.
- DOJ Antitrust division is sceptical of imbalanced SSO patent policies; elements of the new IEEE patent policy used to demonstrate an example of an imbalanced policy.
- Freely negotiated licenses and cross-licenses are the solution.

It would be interesting to watch antitrust enforcement over the next few years, to see where these priorities take US antitrust enforcement.

9 Conclusion

The notion that patents cripple innovation is strongly counterintuitive. Erosion of patent rights can only result in the commoditization of technology, where a few monopsonies control the whole value chain. This would harm innovation and, ultimately, consumers, with fewer choices due to lock-ins. The increasing number of manufacturing companies that disrespect IPR (from copyright to patents),

privacy and taxes is bringing ever decreasing margins and revenues for all suppliers, including content providers, authors, musicians and technology providers.

This chapter has shown the relevance of IPR and the enormous success of standardization thanks to the accessibility of SEPs under FRAND terms. Indeed, standardization has led to interoperable and high performance products at a continuously decreasing price to the benefit of consumers. Standardization is not only nowadays indispensable for a successful economic growth in a country. It will also play a key role for the IoT, as billions of devices will be connected thanks to cellular standards.

There is a need for policy makers in India to support a balance of interests between those using and those contributing standardized technology. Although FRAND is to be determined by the parties in bilateral negotiations, policy makers should reinforce good faith negotiations between parties. In the presence of an unwilling licensee, courts could also identify solutions that can discourage bad behavior. This is relevant as the courts have ordered unwilling licensees to pay only the FRAND rate for past infringement. This in a way incentivises hold-out behavior.⁸⁹ Hold-out itself can lead to less investment in R&D. On the other hand, if courts discourage hold-out, for example, when presented with multiple offers by the patent owner with no counter-offer by the unwilling licensee or other bad faith negotiation tactics from the SEP infringer, courts could grant an injunction and/or order high damages. Another way courts could support quick, binding and transparent solutions to encourage good faith negotiations would be if they would initially make an interim and provisional decision on FRAND (to decide whether or not to grant injunction) and make a final and definitive decision on FRAND at a later stage. This would exert pressure on the parties to engage in negotiation in a timely manner and in good faith.⁹⁰

Disclosure The views presented reflect the individual views of the authors. They do not necessarily reflect Ericsson positions.

⁸⁹Why would an unwilling licensee negotiate a license when it can freely infringe and wait until it gets sued in the court? Royalty required to be paid by such an unwilling licensee after the court ruling would also be on FRAND rates, especially in jurisdictions that do not impose damages for such unwilling conduct.

⁹⁰Haksoo Ko, 'Facilitating Negotiation for Licensing Standard Essential Patents in the Shadow of Injunctive Relief Possibilities' (2013) <<https://ssrn.com/abstract=2267280>>.

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