

**ETSI: A CASE STUDY
IN STANDARD SETTING
AND CAPTURE**
BY STYLIANOS ALEXANDRIDIS

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Centre for Commercial Law Studies
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STATEMENT OF ORIGINALITY

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ABSTRACT

This thesis analyses the problem of patent holdup in the European ICT standardisation process with regard to wireless telecommunications standards. The European standardisation system is based on a co-regulatory model involving collaboration between the European Commission and ETSI with the goal to promote innovation, competition, and consumer welfare via the promulgation of interoperability, harmonised, standards. Often however proprietors of standard essential patents (SEPs) opportunistically holdup users/implementers of SEPs.

The thesis maintains that, despite existing soft-law mechanisms and antitrust measures, patent holdup is an issue that can readily recur, and attributes this to the capture of the co-regulatory regime. It shows that the soft-law mechanisms, including the ETSI IPR Policy, FRAND terms, European Commission's Guidelines and its policy initiatives and strategies for achieving the European Digital Single Market, are insufficient to mitigate patent holdup.

This thesis set out to determine whether patent holdup is a form of regulatory capture undermining the public interest rationale of standard setting. To do so, first, it frames patent holdup in theory and practice. Second, it scrutinises the dynamics of co-regulation in standard setting and how patent holdup is factored into the regulatory capture paradigm. Third, it analyses how theories of regulation, particularly agency theory, inform this assessment and therefore diagnose regulatory capture in EU ICT standard setting. Finally, the thesis investigates the possibility for ex ante regulatory and ex post competition law tools to enable policy recommendations.

This analysis therefore ultimately contributes to the scholarship with regard to the regulation of strategic and opportunistic behaviour of SEP holders. This study should, therefore, be of value to identifying effective measures to restore balance in standard setting consistent with the public interest. This becomes even more important as wireless telecommunications standards have been an intrinsic component to the formation of the European Digital Single Market.

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This thesis is dedicated to the memory of my mother, Areti (01/10/1947-01/12/2015). Her passing dramatically affected me and this project, but I am glad that she saw me embarking on this endeavour before her final days. There are no words to express her eternal love.

This is dedicated to her, my North Star.

“...maybe I’ll see you in another life
...this one wasn’t enough.”
~Florence Leontine Mary Welch

TABLE OF CASES

- AB Volvo v Erik Veng* (Case 238/87) [1988] ECR 6211
- AC-Treuhand v Commission* (Case T-99/04) [2008] ECR II-1501, [2008] 5 CMLR 962
- AKKA/LAA v Konkurences Padome* (C-177/16) [2017] ECLI:EU:C:2017:286
- Apple Inc v Motorola Inc*, Federal Circuit 757 F.3d 1286 (2014)
- Apple Inc v Qualcomm, Inc*, US District Court of California, Case No. 17-cv-0108-GPC-MDD (2017)
- AstraZeneca v Commission* (Case C-457/10 P) [2012] ECLI:EU:C:2012:770
- Cassa di Risparmio di Firenze* (Case C-222/04) [2006] ECR I-289, [2008] 1 CMLR 705
- Cimenteries CBR SA v Commission* (Cases T-25/95) [2000] ECR II- 491, [2000] 5 CMLR 204
- Dell Computer*, 121 Federal Trade Commission 616 (1996)
- Deutsche Telekom v Commission* (Case C-280/08 P) [2010] EU:C:2010:603
- eBay Inc. v MercExchange*, 547 U.S. (2006)
- EMC Development v Commission* (Case T- 432/05) [2010] ECR II- 000, [2010] 5 CMLR 757
- Federal Trade Commission v Qualcomm*, US District Court Northern District of California San Jose Division, Case No.17-CV-00220-LHK (2019)
- France v Commission* (Case C-202/88) [1991] ECR I-1259
- François Lucazeau v. SACEM* (Case C-110/88) [1989]
- Geddo v Ente Nazionale Risi* (Case 2/73) [1973] ECR 865
- GlaxoSmithKline Services Unlimited v Commission and Others* (Case C-501/06 P) [2009] ECR I-9291
- Hoffmann-La Roche v Commission* (Case 85/76) [1979] ECR 461
- Huawei Technologies Co. Ltd v ZTE Corp., ZTE Deutschland GmbH* (C-170/13) [2015] ECLI:EU:C:2015:477
- IMS Health GmbH & Co v NDC Health GmbH & Co.* (Case C-418/01) [2004] ECR I-5039
- Intel v Commission* (Case T-286/09) [2014] EU:T:2014:547
- ITT Promedia NV v Commission* (Case T-111/96) [1998] ECR II-2937

James Elliott Construction (Case C-613/14) [2016] ECLI:EU:C:2016:821

Konkurrensverket v TeliaSonera Sverige AB (Case C-52/09) [2011] ECRI-527

Microsoft v Commission (Case T 201/04) [2007] ECR II-3601

Motorola - Enforcement of GPRS Standard Essential Patents (Case AT.39985)
Commission Decision 2014/C 344/06 [2014] OJ C 344/6

NTT DoCoMo v HTC., Landgericht Mannheim, decision of 29 January 2016, Case No. 7 O 66/15

Orange-Book-Standard, Federal Court of Justice (Bundesgerichtshof), decision of 6 May 2009, Case No. KZR 39/06, GRUR 2009

Organic Peroxides (Case COMP/E-2/37.857) Commission Decision 2005/349/EC [2003] OJ L 110/44

Oscar Bronner GmbH & Co. v Mediaprint Zeitungs und Zeitschriftenverlag GmbH (Case C-7/97) [1998] ECR I-7791

Osterreichische Postsparkasse and Bank fur Arbeit und Wirtschaft v Commission (Cases T-213/01 and T-214/01) [2006] ECR II-1601

Philips v Archos, Landgericht Mannheim, decision of 1 July 2016, Case No. 7 O 209/15

Pioneer v Acer, Landgericht Mannheim, decision of 8 January 2016, Case No. 7 O 96/14

Pioneer v Acer, Oberlandesgericht Karlsruhe, decision of 31 May 2016, Case No. 6 U 55/16

Post Danmark A/S v Konkurrenceradet (Case C 209/10) [2012] ECLI

Procureur du Roi v Benoît and Gustave Dassonville (Case 8/74) [1974] ECR 837

Qualcomm (Exclusivity Payments) (Case AT.40220) [2018] 2018/C 269/16

Qualcomm, Inc. v Broadcom Corp., 539 F. Supp. 2d 1214 (2007)

Rambus (COMP/38.636) Commission Decision 2010/C 30/09 [2010] OJ C 30/17

Rambus Inc. v Federal Trade Commission, cert. denied, 129 S. Ct. 1318 (2009)

Rambus v Federal Trade Commission, 522 F.3d 456 (C. App. D.C. Circuit, 2008)

Rambus, Federal Trade Commission, Case n°9302 (2006)

Rambus, Inc. v Federal Trade Commission, 522 F.3d 456 (D.C. Cir 2008)

Rewe Zentrale v. Bundesmonopolverwaltung für Branntwein (Case 120/78) [1979] ECR 649

RTE and ITP v Commission ("Magill") (Cases C -241/91 P and C-242/91 P) [1995] ECR I-743

Saint Lawrence Communications v Deutsche Telekom, Oberlandesgericht Karlsruhe, decision of 23 April 2015, Case No.6 U 44/15

Saint Lawrence v Vodafone, Landgericht Dusseldorf, decision of 31 March 2016, Case No. 4 O 126/14

Samsung - Enforcement of UMTS Standard Essential Patents (Case AT.39939) Commission Decision 2014/C 350/08 [2014] OJ C 350/80

Sisvel v Haier, Oberlandesgericht Düsseldorf, decision of 30 March 2017, Case No. I-15 U 66/15

Spain and Others v Commission (Cases C271/90, C-281/90 and C-289/90) [1992] joined cases ECR I-5833

Spain v Council (Case C-521/15) [2017] EU:C:2017:982

T-Mobile Netherlands and Others (Case C-8/08) [2009] ECR I-4529

UEFA's Broadcasting Regulations (Case 37.576) Commission Decision 2001/478/EC [2001] L 171/12

United Brands and United Brands Continental v Commission (Case 27/76) [1978] ECR 207

United Kingdom of Great Britain and Northern Ireland v European Parliament and Council (ESMA) (Case C-270/12) [2013], ECLI:EU:C:2014:18

Unwired Planet International v Huawei Technologies [2017] High Court of Justice Chancery Division Patents Court [2017] EWHC 2988 (Pat)

ABBREVIATIONS AND ACRONYMS

3GPPP	Third Generation Patent Platform Partnership
ANSI	American National Standards Institute
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CEPT	European Conference of Postal and Telecommunications Administrations
CJEU	Court of Justice of EU
EN	European Standards
ES	ETSI Standards
ESOs	European Standardisation Organisations
ETSI	European Telecommunications Standards Institute
FRAND	Fair, Reasonable, and Non-Discriminatory
FTC	US Federal Trade Commission
GSM	Global System for Mobile communications
IEEE	Institute of Electrical and Electronic Engineers Standards Association
IPRs	Intellectual Property Rights
IRAs	Independent Regulatory Agencies
ITU	International Telecommunication Union
LOA	Letter of Assurance
MEQR	Measures having Equivalent Effect to Quantitative Restrictions
NSOs	National Standards Organisations
PAEs	Patent Assertion Entities
SDO	Standard Developing Organisation
SEP	Standard Essential Patent
SRAs	Self-regulatory Agencies
SSO	Standard Setting Organisation
TFEU	Treaty on the Functioning of the European Union
UMTS	Universal Mobile Telecommunications Service
US DoJ	US Department of Justice
WCDMA	Wideband Code Division Multiple Access

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1 INTRODUCTION

1.1 Background

With the impending arrival of 5G (the latest generation of wireless telecommunication standards), the information and communications technology (ICT) industry is entering the transitional phase for the adoption of the newest wireless generation. The European Commission (the Commission) has, therefore, introduced a set of policies and strategies to achieve the adoption of the Digital Single Market, including the seamless adoption of 5G.¹ However, the licensing of technologies embedded into the wireless telecommunication standards has been a thorny issue due to the emergence of anticompetitive practices.

Trade wars, spawned primarily between tech giants, such as Samsung, Apple, Qualcomm, Huawei, and Nokia, have emerged in the form of aggressive enforcement of intellectual property rights (IPR) assets, particularly patents, incorporated into smartphones. Hence, these wars are known as ‘smartphone patent wars’.² The

¹ The European Commission, ‘A Digital Single Market Strategy for Europe’, COM(2015) 192 final, 6.5.2015.

² Lim D, ‘Standard Essential Patents, Trolls, and the Smartphone Wars: Triangulating the End Game’ (2014) 119 Penn State Law Review 1; Chia TH, ‘Fighting the Smartphone Patent War with RAND-Encumbered Patents’ (2012) 27 Berkeley Tech Law Journal 209; Carrier MA, ‘A Roadmap to the Smartphone Patent Wars And FRAND Licensing’ (2012) 2 CPI Antitrust Chronicle 1; Oberlander et al., ‘The Smartphone Patent Wars’ (2011) Financial Times, 17 October 2011, available at: www.ft.com/intl/cms/s/2/de24f970-f8d0-11e0-a5f7-00144feab49a.html#axzz45QxPM0iP accessed on 1 September 2019; NY Times, ‘Fighters in a Patent War’ (2012) 7 October 2012 <http://www.nytimes.com/interactive/2012/10/08/business/Fighters-in-a-Patent-War.html> accessed on 1 September 2019; Duhigg C and Lohr S, ‘The Patent, Used as a Sword’ (2012) NY Times available at <https://www.nytimes.com/2012/10/08/technology/patent-wars-among-tech-giants-can-stifle-competition.html?action=click&module=RelatedCoverage&pgtype=Article®ion=Footer> accessed on

first phase of these wars took place throughout the last decade with a worldwide impact. These were intensified with the advent of smartphones and the release of the 3G and then the 4G wireless telecommunication networks (the predecessors of 5G) for reasons explored further later in the study. The tech giants, competing for market supremacy in the smartphones' arena, have converted their patents for technologies embedded into wireless telecommunication interoperability standards into weapons against their rivals.

Such patents are of a unique importance and they play a pivotal role in the process of setting technical standards, such as wireless telecommunication standards (ICT standards), as well as in the manufacturing of standard-compliant smartphones. In broad terms, these patents comprise 'standard essential patents' (SEPs) where they read on a technology that a manufacturer must use in order to manufacture products that comply with the technical standards.³ These essential patents cannot be bypassed as they incorporate the functionality of a standard.⁴ Technical standards are considered not only critical to the development of innovative and less costly technologies but also as facilitating the diffusion of horizontally interoperable and compatible products in the networked ICT sector. These are the very reasons why the joint conduct and promulgation of technical standards by possible

1 September 2019; Kumar A and Bhasin BS, 'Innovation and Survival: Lessons from the Smartphone Wars' available at <https://www.iam-media.com/innovation-and-survival-lessons-smartphone-wars> accessed on 1 September 2019.

³ The Competition Directorate-General of the European Commission, 'Competition Policy Brief: Standard-Essential Patents' available at http://ec.europa.eu/competition/publications/cpb/2014/008_en.pdf accessed 1 September 2019.

⁴ Lerner J, Tabakovic H and Tirole J, 'Patent Disclosures and Standard-Setting' (2017) Harvard Business School working paper series 17-030 1, 3.

competitors, usually via standard setting organisations (SSOs), is generally not considered anticompetitive.⁵

In Europe, the development of technical standards is based on the establishment of a co-operation between the European Commission (the Commission) and European Standards Organisations (ESOs).⁶ The latter, including European Telecommunications Standards Institute (ETSI), a multi-stakeholder SSO and the primary focus of this study, has been delegated, via a co-regulation paradigm, to produce various *de jure* harmonised official ICT standards “[...] to support European regulation and legislation which are defined in Regulations, Directives and Decisions developed by the EU.”⁷ These are also known as European standards/harmonised standards (EN). The European standardisation system is, thus, regarded as a system of delegated rule making.⁸

Although the use of *de jure* European harmonised standards remains voluntary for manufacturers,⁹ their adherence provides a presumption of conformity with

⁵ European Commission, ‘ICT and Standardisation’ available at <https://ec.europa.eu/digital-single-market/en/standardisation> accessed on 1 September 2019.

⁶ The European Standards Organisations consists of the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC) and ETSI (European Telecommunications Standards Institute).

⁷ ETSI, ‘ETSI Role in Europe: Supporting European Regulation and Legislation’, available at <http://www.etsi.org/about/what-we-are/role-in-europe> accessed on 1 September 2019.

⁸ Medzmariashvili M, ‘Delegation of Rulemaking Power to European Standards Organizations: Reconsidered’ (2017) *Legal Issues of Economic Integration* 353, 355; Schepel H, ‘Between Standards and Regulation: On the Concept of ‘de facto Mandatory Standards’ after Tuna II and Fra.bo’ in Delimatsis P (ed) *The Law, Economics and Politics of International Standardisation* (Cambridge University Press 2015) 200.

⁹ The voluntary status of standards, however, was not prevalent when mandated harmonised standards were first introduced in Europe. Manufacturers had to adopt these if they wished to use their equipment in Europe in addition to the conformity for safety requirements. See Gandal N, Salant D and Waverman L, ‘Standards in Wireless Telephone Networks’ (2003) 27 *Telecommunications Policy* 325. See 3.2 on a discussion on the topic of harmonised standards.

relevant EU legislation.¹⁰ Therefore, harmonised standards, presumably, have become binding “*de facto*” for manufacturers to market their products within the Member States.¹¹ This justifies that, while the implementation of harmonised ICT standards is not compulsory, the market more frequently than previously adopts a single standard that could dominate the technological development of a service or product for many evolutionary generations.¹²

Such technological standards have proliferated, accompanying the revolution in ICT over the last thirty-five years.¹³ At the same time, the world has also witnessed an explosion in the use of intellectual property rights (IPRs), including notably patents, to protect such technologies.¹⁴ Both trends have affected ICT standardisation processes. The purpose of ICT standards to establish uniform engineering or technical specifications for wide diffusion and ready use by the market for products made in conformity with them is in stark contrast to that of patents, where the monopoly grant intends to restrict the use of the specifications therein ‘taught’ by the patent to its owner alone.¹⁵ The intertwining of these two areas has produced an

¹⁰ Article 2 of the Council Regulation 1025/2012 of 25 Oct. 2012 on European standardization amending Council Directives 89/686/EEC and 93/15/EEC and Directives 94/9/EC, 94/25/EC, 95/16/EC, 97/23/EC, 98/34/EC, 2004/22/EC, 2007/23/EC, 2009/23/EC and 2009/105/EC of the European Parliament and of the Council and repealing Council Decision 87/95/EEC and Decision No 1673/2006/EC of the European Parliament and of the Council (2012) OJ L 316/12.

¹¹ Schepel H, *The Constitution of Private Governance: Product Standards in the Regulation of Integrating Markets* (Hart Publishing, 2005) 226.

¹² For instance, 3G, 4G, and 5G technologies are compiled by components of previous standards.

¹³ Farber D and Baran P, ‘The Convergence of Computing and Telecommunications Systems’ (1977) 195 *Science* 1166.

¹⁴ Hall BH, ‘Exploring the Patent Explosion’ (2004) 30 *The Journal of Technology Transfer* 35; Hall BH and Ham RM, ‘The Patent Paradox Revisited: Determinants of Patenting in the US Semiconductor Industry, 1980-94’ (1999) No. 7062 National Bureau of Economic Research Working Paper Series, 1.

¹⁵ Heath C, ‘Patents and Standards’ in Hwang T-L and Chen C, *The Future Development of Competition Framework* (Kluwer Law International 2004) 131.

inherent tension.¹⁶ Multiple inventions can be incorporated into a single technology standard to provide interoperability and reliability across products and services. The result is that the cumulative use of patents for technologies that are heavily integrated into standards, the increased propagation, and the significance of standards in ICT markets has enhanced substantially the market power of SEP holders for technologies deemed necessary for conformity with an identified ICT standard.

Further relevant is that ICTs are also rapidly but incrementally developed and upgraded in ways that create path dependencies for future technologies and a lock-in to decisions made about earlier technologies.¹⁷ Discontinuation of a standard in this case is unlikely to happen.¹⁸ In such circumstances, SEPs can constitute a highly valuable asset to their holders and correlate with market power, generating substantial economic returns and market value with a strong impact on the position of a firm in the particular network market.¹⁹

Strategic behaviour via opportunistic engagement in standardisation processes by industry participants have produced outcomes that threaten the adoption of standards.²⁰ Specifically, with a patented technology selected and incorporated

¹⁶ The topic of tension between patents and standards is further discussed in Chapter 3; Swann GP, *The Economics of Standardization: An Update*, (Report for the UK Department of Business, Innovation and Skills (BIS), 2010) 1, 9.

¹⁷ Seo D, *Evolution and Standardization of Mobile Communications Technology* (Information Science Reference 2013)

¹⁸ Baron J, Pohlmann T and Blind K, 'Essential Patents and Standard Dynamics' (2016) Research Policy 1721, 1768.

¹⁹ Layne-Farrar A and Wong-Ervin K, 'Standard-Essential Patents and Market Power' (2016) World Competition Day, George Mason Law & Economics Research Paper No. 16-47 available at SSRN: <https://ssrn.com/abstract=2872172> accessed on 1 September 2019.

²⁰ According to a study commissioned by the European Commission, the frequency of SEP litigation has increased substantially over the past 30 years. See the European Competitiveness and Sustainable Industrial Policy Consortium, 'Patents and Standards: A Modern Framework for IPR-based Standardization' (2014) 1, 126.

into a standard, the SEP holder can leverage their market power and holdup other industry participants in various ways.²¹ A SEP holder can aggressively enforce its IPRs by seeking injunctive relief to block the use of the patented technologies included within a standard in order to prevent or delay entry into a market by all or specific competitors.²² Also, in ICT product markets where many technologies must be licensed in combinations, a SEP owner can holdup others by demanding excessive royalties for a single or a number of patents, driving up the product's cumulative costs (royalty stacking).²³ These examples are representative of how SEP holders

²¹ Camesasca P and others, 'Injunctions for Standard-Essential Patents: Justice Is Not Blind' (2013) 9 *Journal of Competition Law and Economics* 285; Langus G, Lipatov V and Neven D, 'Standard-Essential Patents: Who Is Really Holding Up (And When)?' (2013) 9 *Journal of Competition Law and Economics* 253; Shapiro C, 'Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting' (2000) 1 *Innovation Policy and the Economy* 119; Shapiro C, 'Setting Compatibility Standards: Cooperation or Collusion' in Dreyfuss RC et al eds, *Expanding the Bounds of Intellectual Property: Innovation Policy for the Knowledge Society* (Oxford University Press, 2001); Sidak JG, 'The Meaning of FRAND, Part I: Royalties' (2013) 9 *Journal of Competition Law and Economics* 931; Sidak GJ, 'The Meaning of FRAND, Part II: Injunctions' (2015) 11 *Journal of Competition Law and Economics* 201; Sidak J, 'Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro' (2007) 93 *714*; Bekkers R and West J, 'The Limits to IPR Standardization Policies as Evidenced By Strategic Patenting in UMTS' (2009) 33 *Telecommunications Policy* 80; Berger F, Blind K and Thumm N, 'Filing Behaviour Regarding Essential Patents in Industry Standards' (2012) 41 *Research Policy* 216; Gilbert RJ, 'Deal or No Deal? Licensing Negotiations in Standard-Setting Organizations' (2011) 77 *Antitrust Law Journal* 855; Bekkers R, 'Knowledge Positions in High-Tech Markets: Trajectories, Standards, Strategies and True Innovators' 79 *Technological Forecasting & Social Change* 1192; Bekkers R, Iversen E and Blind K, 'Emerging Ways to Address the Re-emerging Conflict between Patenting and Technological Standardization' (2012) 21 *Industrial and Corporate Change* 901.

²² Angwenyi V, 'Hold-up, Hold-out and F/RAND: The Quest for Balance' (2017) 12 *Journal of Intellectual Property Law & Practice* 1012; Barazza S, 'Licensing Standard Essential Patents, Part One: The Definition of F/RAND Commitments and the Determination of Royalty Rates' (2014) 9 *Journal of Intellectual Property Law & Practice* 465; Barazza S, 'Licensing Standard Essential Patents, Part Two: The Availability of Injunctive Relief' (2014) 9 *Journal of Intellectual Property Law & Practice* 552; Tsilikas H, 'Standards-Setting and Competition Policy' in *Antitrust Enforcement and Standard Essential Patents* (1 edn, Nomos Verlagsgesellschaft mbH 2017) 1, 22.

²³ Farrell J and others, 'Standard Setting, Patents, and Hold-Up' (2007) 74 *Antitrust Law Journal* 603, 645; Lemley MA and Shapiro C, 'Patent Holdup and Royalty Stacking' (2006) 85 *Texas Law Review* 1991; Geradin D, Layne-Farrar A and Padilla AJ, 'Complements Problem within Standard Setting; Assessing the Evidence on Royalty Stacking, The' (2008) 14 *Boston University Journal of Science & Technology Law*; Geradin D and Rato M, 'Can Standard-Setting Lead To Exploitative Abuse? A Dissonant View on Patent Hold-Up, Royalty Stacking and The Meaning Of FRAND' (2007) 3 *European*

could strategically use their IPR assets in order to exercise their market power and holdup users of SEPs.

Patent holdup is the most egregious example of growing threat in standard setting. Such practices are considered a serious impediment to the implementation of interoperability standards and the efficient licensing of SEPs but may also amount to abuse of dominance breaching Article 102 of TFEU.²⁴ Therefore, SEPs have become the “apple of discord” between the SEP holders/proprietors and the SEP users/implementers.

To counter such behaviours, ETSI has adopted policies, rules of procedure and bylaws that set forth obligations on and requirements for their members to reduce the risk of a standard becoming unavailable to practise.²⁵ If a patent is included within and considered essential to the practice of an agreed standard, the ETSI IPR Policy requires its licensing on fair, reasonable, and non-discriminatory terms

Competition Journal 101; Elhauge E, ‘Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?’ (2008) 4 Journal of Competition Law and Economics 535; Cockburn IM, MacGarvie MJ and Müller E, ‘Patent Thickets, Licensing and Innovative Performance’ (2010) 19 Industrial and Corporate Change 899; Melamed AD and Shapiro C, ‘How Antitrust Law Can Make FRAND Commitments More Effective Collection: Unlocking Antitrust Enforcement’ (2017) Yale Law Journal 2110, 2111; Padilla J, Ginsburg DH and Wong-Ervin K, ‘Antitrust Analysis Involving Intellectual Property and Standards: Implications from Economics’ (2019) Harvard Journal of Law & Technology 1, 17 available at SSRN: <https://ssrn.com/abstract=3119034> accessed on 1 September 2019; Geradin D, et al., *The Ex Ante Auction Model for the Control of Market Power in Standard Setting Organizations*, CEMFI Working Paper 0703 (May 2007), available at SSRN: <https://ssrn.com/abstract=979393> accessed on 1 September 2019; Scott Bosworth D, Mangum Iii RW and Matolo EC, ‘FRAND Commitments and Royalties for Standard Essential Patents’ in Bharadwaj A and others (eds), *Complications and Quandaries in the ICT Sector: Standard Essential Patents and Competition Issues* (Springer Singapore 2018) 25; See also Chapter 2.

²⁴ The European Competitiveness and Sustainable Industrial Policy Consortium, ‘Patents and Standards: A Modern Framework for IPR-based Standardization’ (2014) s 2.1.1; Lambert R and Temple P, ‘The Relationship between Standards, Standards Development and Intellectual Property’ (British Standards Institution) (2015) section 1.8, 17 available at <http://www.bsigroup.com/LocalFiles/en-GB/standards/BSI-Standards-and-IP-2015-UK-EN.pdf> accessed 1 September 2019; Lundqvist Bjorn, ‘Competition Law as the Limit to Standard-Setting’ available at <https://ssrn.com/abstract=2551026> accessed on 1 September 2019.

²⁵ ETSI, ‘ETSI Rules of Procedure’, s 3.1, Annex 6: ETSI Intellectual Property Rights Policy.

(FRAND).²⁶ For reasons explored in this study, ETSI members have been readily able to circumvent ETSI's '*de jure*' FRAND obligations and soft-law mandates by the Commission,²⁷ to holdup users of SEPs. Therefore, this study claims that strategic behaviour and opportunism in standard setting has been not sufficiently tackled and could become an impediment to achieving the objectives that the Commission has set for the Digital Single Market.

Below, five initial topics regarding this study are considered. First, the hypothesis and research question are outlined. This is followed by a summary of the significance and scope of the study. The theoretical framework, research methodology, and limitations are then discussed. Finally, this introduction briefly outlines the four chapters of the study that follow.

1.2 Hypothesis and Research Question

There has been no detailed investigation of regulatory capture in EU ICT standardisation. To fill this gap in the literature, this study is premised on the hypothesis that patent holdup issues originate from inefficiencies of the EU's standard setting co-regulatory regime and, primarily, the capture of ETSI. Hence, a revamped co-regulatory regime should be formulated on two levels: first, the Commission should protect public policy objectives and public interest, entrenched in standard setting, from private interests and opportunism of ETSI members; and second, ETSI should overhaul its rules and procedures to prevent its members from holding up

²⁶ Ibid, s 6.1.

²⁷ European Commission, 'Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-operation Agreements' (2011) OJ C11/01 280.

users of standards. To test this hypothesis, the study assesses the following key question:

“Is the current model of European co-regulation between the Commission and ETSI sufficient to deal with patent holdup issues and strategic behaviour arisen in European ICT standards market?”

The investigation and assessment of this question will provide an extensive analysis of the functioning of the co-regulatory model in European standardisation system. This will offer insights in the policy discussion and provide answers to how the regulatory model in standard setting could be revised in order to safeguard public interest, transparency, accessibility to standards, and restore the equilibrium between SEP holders and users in the market.

1.3 Significance and scope of the study

The academic literature has predominantly focused on the meaning of FRAND, the calculation of FRAND royalties, and the legitimacy of SEP enforcement to provide answers to the perplexed topic of patent holdup; this study, in contrast, seeks to understand and explain the root-cause of patent holdup issues in conjunction with strategic behaviour of ETSI members in ICT standard setting. Despite the many efforts to eliminate patent holdup in standard setting the risk remains. As will be examined here, soft-law mechanisms and ex post competition law enforcement alone are not a panacea to the problem of patent holdup.

This study employs theories of regulation to analyse via regulatory lenses the occurrence of patent holdup as a form of regulatory capture, and to identify the

means to mitigate such patent holdup in the European standardisation system. The utilisation of the regulatory theories serves as the mechanism to evaluate the regulatory regime of the European standardisation system and to enhance the understanding of the regulatory relationship of the actors involved in the standardisation process. The objective of this examination is to attribute the problem of patent holdup to the ill-equipped co-regulatory regime and to provide solid remedies against opportunistic engagement in ICT standard setting.

The starting point to this evaluation is an examination of the main actors, their roles and participation in the standardisation process. As will be shown, a triangular relationship exists in the regulatory process of standard setting, namely that between the EU Member States and the Commission, the Commission and ETSI, and that between ETSI and stakeholders (industry participants).²⁸ The former exists as the standard setting regulatory regime, which is based on the co-regulatory model, namely the partnership between the Commission and ETSI.²⁹ This relationship is characterised as an agency relationship, where the Commission acts as the principal and ETSI as its agent. As will be analysed in this study, the Commission's 1989 del-

²⁸ See 3.4.1.

²⁹ As the key policy-maker of standardisation in Europe, the Commission conducts various regulatory initiatives regarding standardisation to ensure the competitiveness and openness of the market, the functioning of the Single Market, and the promulgation of innovation. Further, the Commission uses standardisation as a tool to achieve certain goals and pursue strategies for the enhancement of the EU economy as well as to support EU public policy initiatives, e.g. Digital Single Market, Joint Initiative on Standardisation, Horizon 2020.

egation of exclusive regulatory competence to ETSI for the development of standards in the area of telecommunications created this principal–agent relationship,³⁰ linked to the Commission’s efforts to harmonise and liberalise the EU’s Single Market for telecommunications.³¹ ETSI, thereby, has flourished, exercising in a relatively *ad hoc* manner the exclusive regulatory power to produce harmonised standards in Europe.

As will be discussed, ETSI is, simultaneously, a self-regulatory body and a ‘quasi-public body’.³² This is because, on the one hand, ETSI, as a non-state and self-regulatory body, has its own set of self-defined rules and policies, for members. On the other, in its designated role it is a quasi-public body that participates in the policy-making of technical specifications.

The further examination of ETSI’s funding, governance and composition, identifies three notable attributes that may foster the above-noted member ability to engage in opportunistic behaviour. The first is that ETSI has no rules that specifically tackle patent holdup regarding the licensing of SEPs. The second is that ETSI’s weighted voting system creates the ability for certain groups or individual members

³⁰ A helpful definition of principal – agent terms provided by Curtin reads as: “[p]rincipals can be [...] defined as those institutions (the Council of Ministers, the Commission and –potentially in the future- the European Council) that use their authority to establish non-majoritarian institutions through a public act of delegation. Agents on the other hand are those who govern by exercising delegated powers.” See Curtin D, ‘Delegation to EU Non-Majoritarian Agencies and Emerging Practices of Public Accountability’ in Geradin D, Muñoz R and Petit N (eds), *Regulation through Agencies: A New Paradigm of European Governance* (Edward Elgar 2005) 88; Weingast BR, ‘The Congressional-Bureaucratic System: A Principal Agent Perspective (with applications to the SEC)’ (1984) 44 *Public Choice* 147; Gilardi F, ‘Principal-Agent Models Go to Europe: Independent Regulatory Agencies as Ultimate Step of Delegation’ (2001) (ECPR General Conference, Canterbury) 1.

³¹ European Commission, ‘European Governance - A White Paper’ COM(2001) 428 final OJ C 287, 12.10.2001.

³² See 3.4.1 and 4.2.2.2. See also Bignami F and Zaring D, *Comparative Law and Regulation* (Edward Elgar Publishing 2016) 391.

to unduly influence, and even change, standards selected and, therefore, the likely technologies that would be essential to the standards' practice. The third factor is a lack of oversight and/or independent checks on the outcomes of this possibly skewed voting or a balancing of the respective interests. While the technical contributors' participation in the standardisation process has been perceived as a vigorous race for inclusion of patents into standards,³³ this study will examine whether, in contrast, the existing voting system of ETSI facilitates the pursuit of various special interests by the members during the different stages of standardisation. Despite that there is a consensus-based principle for decision-making,³⁴ no other provision exists to safeguard the fairness of the process. This suggests that ETSI members holding a substantial number of weighted votes could readily and substantially control the outcome of the standardisation process. Moreover, ETSI's significant reliance on industry members' financial contributions underlies the feasibility of capture. Therefore, unrestrained ETSI members can engage in anticompetitive conduct and charge supra-FRAND royalties.

An important observation should be made, therefore, at this point: although ETSI has been given regulatory power to control standard setting to an extent, this discretionary power is not extended directly to its members. The paradox here is

³³ Besen SM and Farrell J, 'Choosing How to Compete: Strategies and Tactics in Standardization' (1994) 8 *Journal of Economic Perspectives* 117; Kai J (ed) *Modern Trends Surrounding Information Technology Standards and Standardization within Organizations* (IGI Global 2015) 1, 40.

³⁴ ETSI Directives define 'consensus' as follows: "General agreement, characterized by the absence of sustained opposition to substantial issues by any important part of the concerned interest and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments." ETSI, 'ETSI Directives: ETSI Technical Working Procedures', Annex A: A1.

that ETSI members, however, indirectly exercise the regulatory power that enables them to select their own patented technologies.

In light of the above, the importance and originality of this study is that it illustrates how ETSI members, via strategic behaviour and driven by special interests, engage in capture, thereby casting doubt about the transparency, legitimacy, accountability and impartiality of ETSI decision-and-policy-making procedures, and governance. It further explores the means of addressing, limiting and preventing patent holdup as a form of regulatory capture. Hence, this study not only sheds new light on the source of patent holdup but also offers the remedies to thwart it with the improvement of the European standardisation system through policy and regulatory measures.

1.4 Theoretical Framework

In developing the arguments and recommendations set out in this study, the analytic framework is built upon the theories of regulation, which support the analysis of the patent holdup in EU ICT standard setting. The regulatory regime of standard setting is multidimensional and multi-sectoral with linkage to various regulatory models. Therefore, the ICT standardisation process, as formed in the EU context, has been nested within the concepts of better regulation, co-regulation, self-regulation.³⁵

³⁵ The European Economic and Social Committee - Single Market Observatory (SMO), 'Co-regulation and Self-regulation: Current State of Co-regulation and Self-regulation in the Single Market' (2015); Schepel H, *The Constitution Of Private Governance : Product Standards in the Regulation of Integrating Markets* (Hart Pub 2005) 39. See also 3.3.1.

As will be shown, co-regulation was introduced as part of better regulation, an alternative regulatory mechanism of governance, to speed up the legislative process and simultaneously enhance the European integration by reducing the legislative burden.³⁶ The approach of co-regulation departs from that of traditional and centralised command-and-control approach, where only governmental or public authorities regulate a process.³⁷ This regulatory model entails a less prescriptive framework of rules by the legislator. It is also rooted in the participation of both state and private actors in the process of rule- and policy-making.³⁸ The state regulator, who monitors the regulatory process, authorises and shares the discretionary power with non-state actors to self-regulate a process with their own standards and rules in order to jointly achieve public policy goals.³⁹

A core element of this study is the demonstration of the contradiction between the self-interests of ETSI members and the public interest of standard setting.

³⁶ Senden et al, 'Mapping Self- and Co-regulation Approaches in the EU Context' (European Economic and Social Committee, March, 2015) available at <http://www.eesc.europa.eu/?i=portal.en.self-and-co-regulation-literature.37834> accessed 1 September 2019; European Economic and Social Committee, 'European Self- and Co-regulation' (2003) available at https://www.eesc.europa.eu/sites/default/files/resources/docs/auto_coregulation_en--2.pdf accessed on 1 September 2019.

³⁷ Baldwin R, Cave M and Lodge M, *Understanding Regulation: Theory, Strategy, and Practice* (2nd edn, Oxford University Press 2012) 1, 106; Sinclair D, 'Self-Regulation Versus Command and Control? Beyond False Dichotomies' (1997) 19 *Law & Policy* 529; Rabin RL, 'Federal Regulation in Historical Perspective' (1986) 38 *Stanford Law Review* 1189, 1295; Stewart RB and Sunstein CR, 'Public Programs and Private Rights' (1982) 95 *Harvard Law Review* 1193.

³⁸ Lodge defines co-regulation as: "[...] an explicitly specific non-state regulatory regime set up as part of a (inter)-governmental strategy. In short, they are directly linked to public policy goals (reduced emissions, for example) and are supported by state-based legal frameworks." Lodge M and Wegrich K, *Managing Regulation : Regulatory Analysis, Politics And Policy* (Palgrave Macmillan 2012) 105; See also Chalmers D, Davies GT and Monti G, *European Union law : Cases and Materials* (2nd edn, Cambridge University Press 2010) 369-371; Verbruggen P, 'Does Co-Regulation Strengthen EU Legitimacy?' (2009) 15 *European Law Journal* 425; Ayres I and Braithwaite J, *Responsive Regulation : Transcending The Deregulation Debate* (Oxford University Press 1995) 102.

³⁹ *ibid* 38 Lodge M and Wegrich K, at 105; Scott C, 'The Governance of the European Union: The Potential for Multi-Level Control' (2002) 8 *European Law Journal* 59, 66-67.

The Commission and the Council have recognised that public interest is central to standard setting, in a series of official documents and reports.⁴⁰ The majority of these although outlining the voluntary nature of standard setting, emphasise that standardisation should be based on the principles of transparency, openness, consensus, impartiality, coherency, effectiveness and relevance, and independence of vested interests.⁴¹ However, based on the empirical evidence examined in this study, technical contributors who participate in the standardisation process seek to include their technologies into the standards and acquire the essentiality status even if their patented technologies are not sufficiently meritorious. It can be inferred from this that the determinants of standard setting could be based on ex ante strategic behaviour during the pre-standardisation process which could then manifest as opportunism post-standardisation.

Opportunistic behaviour, such as patent holdup, of ETSI members and furtherance of their own interests arguably erodes the public interest character of the

⁴⁰ European Council Resolution ‘on the Role of European Standardisation in the European Economy’ OJ 1992 C 173/1 para 9; European Council Resolution ‘on the role of Standardisation in Europe’ of 28 October 1999 OJ C 141 para 10; European Commission ‘on Actions Taken Following the Resolutions on European Standardisation Adopted by the Council and the European Parliament in 1999’ COM(2001) 527 final paras 9, 13 and 25; European Commission, Working Paper on the ‘Role of the Authorities in Standardization Under The New Approach’ (1999) SOGS N302; European Commission Report ‘Efficiency and Accountability in European Standardisation under the New Approach’ COM(1998) 291 final.

⁴¹ Those principles were transposed from WTO - Agreement on Technical Barriers to Trade principles for the field of standard setting. See European Council Resolution ‘on the Role of European standardisation in the European Economy’ OJ 1992 C 173/1 of 18 June 1992 para 8; European Commission Notice ‘The ‘Blue Guide’ on the implementation of EU products rules 2016’ OJ C 272/01 of 26 July 2016, s 4.1.2.3 para 6; European Commission Green Paper on ‘The Development Of European Standardization Action for Faster Technological Integration in Europe’ COM(90) 456 final; European Commission Communication ‘A Strategic Vision for European Standards: Moving Forward to Enhance and Accelerate the Sustainable Growth of the European Economy by 2020’ COM(2011) 311 final; European Commission ‘General Guidelines For The Cooperation Between CEN, CENELEC and ETSI and the European Commission and The European Free Trade Association’ OJ C91/8.

standardisation process and the Commission's efforts to maximise consumer welfare and effective competition through standard setting.⁴² Moreover, as will be explored later in this study, such opportunistic practices, including aggressive enforcement of SEPs, likely pose a market failure that justifies the regulatory intervention of the authorities.⁴³ Based on the theoretical analyses of public interest and pro-competitive regulation propositions, the Commission's responsibility to intervene can be found in the duty to protect consumer welfare from opportunism and market failure.⁴⁴

This study will assert that the co-regulatory regime between the Commission and ETSI is captured by the private interests of ETSI members. As outlined earlier, the study will endeavour to establish how the internal rules and structure of ETSI facilitate the ability of private interests to eventually overtake the public interest. In that regard, the opportunism stemming from ETSI members will be elaborated as a

⁴² The European Competitiveness and Sustainable Industrial Policy Consortium, 'Patents and Standards: A modern framework for IPR-based standardization' (2014) Section 2.1.1, 25.

⁴³ Market failure has been defined as "a circumstance where the pursuit of private interest does not lead to an efficient use of society's resources or a fair distribution of society's goods". See Weimer DL and Vining AR, *Policy Analysis: Concepts and Practices* (2nd edn, Englewood Cliffs, NJ, 1992); MacRae D and Wilde JA, *Policy Analysis for Public Decisions*, (Lanham, MD, 1985), 170; Veljanovski C, 'Economic Approaches to Regulation' in Baldwin R, Cave M and Lodge M, *The Oxford Handbook of Regulation* (Oxford University Press 2010) 17; Bator FM, 'The Anatomy of Market Failure' (1958) 72 *The Quarterly Journal of Economics* 35.

Market failure rationales are nested in economic regulatory analysis which attempts to "identify the failure of the market which justifies intervention; select the method of intervention which predictably will correct that failure at least cost." See Ogus A, 'W(h)ither the Economic Theory of Regulation? What Economic Theory of Regulation?' in *The Politics of Regulation Institutions and Regulatory Reforms for the Age of Governance* (Edward Elgar Publishing, 2004) 31-32; Coase RH, 'The Problem of Social Cost' (1960) *The Journal of Law and Economics* 3, 1-44' (1992) 9 *Systems Research* 79.

In accordance to the normative theories of regulation, market failure is premised on four factors: market power, externalities, public goods, and information asymmetries. *Supra* note 37 in Baldwin R, Cave M and Lodge M at 17; see *supra* note 38 in Lodge M and Wegrich K at 18-25.

⁴⁴ Dal Bó E, 'Regulatory Capture: A Review' (2006) 22 *Oxford Review of Economic Policy* 203, 204.; Lindblom CE, *Politics and Markets: The World's Political-Economic Systems* (Basic Books 1977); Thatcher M, 'Regulation After Delegation: Independent Regulatory Agencies in Europe' (2002) 9 *Journal of European Public Policy* 954, 969.

twofold capture: “intra-capture”, the primary capture that occurs between ETSI and its members; and “inter-capture”, the secondary, indirect, capture of the Commission by ETSI as a result of intra-capture.

If ETSI’s structure, governance and finance does enable such capture, it is also to be questioned whether the Commission and its policies have not also contributed. In contrast to ETSI’s predecessor, CEPT, the Commission strengthened ETSI’s status with the transfer of regulatory power without robust control mechanisms. Such distribution of regulatory competence to a specialised and independent agent of this type, comprised largely of private members, engenders the risk of capture. Schepel, highlights the lack of control in this context, noting that “[t]he powers of the European standards bodies go far beyond ‘implementation’; there is no control or supervision of the Commission or possibilities of judicial review.”⁴⁵ In agreement with this view, this study explores the determinants of capture in standard setting, notably how ETSI, instead of serving public interest, accommodates either individual or collective private interests. It will further explore the degree to which such private interests are integrated into ETSI operations. It will examine how and to what extent this results in ETSI’s apparent ‘laissez-faire’ stance with respect to patent hold up and its reluctance to promulgate pro-competitive and fair rules for the users of standards.

The above propositions will be analysed in this study under theories of regulation that have been developed by economists and legal scholars. In examining the

⁴⁵ Schepel H, *The Constitution of Private Governance: Product Standards in the Regulation of Integrating Markets* (Hart Publishing, 2005) 227.

agency relationship, i.e. the relationship between the principal, the Commission, and the agent, ETSI, the study will identify key variables of possible deficiencies in the regulatory process of standard setting including the agency problem and capture.

This study will evaluate the capture of the standardisation process in keeping with Carpenter and Moss's and other scholars' theories on regulatory capture, for the purpose of detecting and diagnosing regulatory capture in ETSI. This study applies both public⁴⁶ and private interest⁴⁷ theories of regulation. The public interest theories deploy market failure rationales,⁴⁸ whereas, private interest theories delineate how regulation succumbs to narrow special interests.⁴⁹ Using the latter, the study will expound on theories of capture in combination with the agency theory to apply them to the context of ETSI. In synthesizing the structural and regulatory flaws in ETSI, members' opportunism and strategic behaviour will be analysed under the

⁴⁶ Posner RA, 'Theories of Economic Regulation' (1974) 5 *Bell Journal of Economics* 335; Becker G, 'Toward a More General Theory of Regulation' (1976) 19 *The Journal of Law & Economics* 245; Olson M, *The Logic of Collective Action: Public Goods and the Theory of Groups* (Harvard University Press 1971); Levine ME and Forrence JL, 'Regulatory Capture, Public Interest, and the Public Agenda: Toward a Synthesis' (1990) 6 *Journal of Law, Economics, & Organization* 167; Hantke-Domas M, 'The Public Interest Theory of Regulation: Non-Existence or Misinterpretation?' (2003) 15 *European Journal of Law and Economics* 165; Morgan B and Yeung K, *An Introduction to Law and Regulation: Text And Materials* (Cambridge University Press 2007); supra note 37 in Baldwin R, Cave M and Lodge M at 40; Ogus AI, *Regulation: Legal Form and Economic Theory* (Bloomsbury Publishing 2004).

⁴⁷ Niskanen WA, *Bureaucracy and Representative Government* (Aldine-Atherton 1971); Lodge M, 'The Wrong Type of Regulation? Regulatory Failure and the Railways in Britain and Germany' (2002) 22 *Journal of Public Policy* 271, 274; see n38 in Baldwin R, Cave M and Lodge M at 76.

⁴⁸ Foster CD, *Privatization, Public Ownership and the Regulation of Natural Monopoly* (Blackwell 1992); McLean I, 'The history of regulation in the United Kingdom: Three case studies in search of a theory' in in Jordana J and others (eds), *The Politics of Regulation Institutions and Regulatory Reforms for the Age of Governance* (Edward Elgar Publishing, 2004) 45; supra note 46 in Levine ME and Forrence JL, at 168; Stigler GJ, 'The Theory of Economic Regulation' (1971) 2 *The Bell Journal of Economics and Management Science* 3; see supra note 39 in Lodge M and Wegrich K, at 30; Supra note 44 Dal Bó E.

⁴⁹ Supra note 37 in Baldwin R, Cave M and Lodge M at 76.

conceptual model of the tripartite capture devised by Carpenter.⁵⁰ In the principal-agent context, Posner explains regulatory capture as: “[...] the subversion of regulatory agencies by the firms they regulate. [...] Capture implies conflict, and regulatory capture implies that the regulated firms have, as it were, made war on the regulatory agency and won the war, turning the agency into their vassal.”⁵¹ Regulatory failure is imminent when elements of capture overtake a regulatory process.⁵²

Building on the above, this study ultimately aims to show how regulatory opportunism⁵³ fosters and becomes the medium for either ex ante or ex post opportunism.⁵⁴ It will provide an analysis that will consider the problem of patent holdup to coincide with regulatory capture. Having in this section preliminarily set out the theoretical framework, the next section lays out the research methodology and limitations that will be applied and situates the specific contents of this analysis as addressed in the remaining chapters of the thesis.

⁵⁰ Carpenter D, ‘Detecting and Measuring Capture’ in Carpenter D and Moss DA, *Preventing Regulatory Capture: Special Interest Influence and How to Limit it* (Cambridge University Press 2013) 63.

⁵¹ Posner RA, ‘The Concept of Regulatory Capture: A Short, Inglorious History’ in Carpenter D and Moss DA, *Preventing Regulatory Capture: Special Interest Influence and How to Limit it* (Cambridge University Press 2013) 49.

⁵² Morgan and Yeung illustrate clearly the link between regulatory capture and failure: “Regulatory capture happens when officials within regulatory institutions who are charged with promoting collective welfare develop such close relationships with those they regulate that they promote the narrow interests of this group instead of the public interest of the broader community. It is an important way in which regulatory failure can happen, i.e. when the collective costs of regulation outweigh the benefits it brings.” Supra note 46 in Morgan B and Yeung K at 43.

⁵³ Regulatory opportunism can be defined as: “[...] where an undertaking organises its activities so as to fall under classifications which entail the least regulatory constraints, in order to acquire competitive advantage.” See Frieden R, ‘Whither Convergence: Legal, Regulatory and Trade Opportunism in Telecommunications’ in Geradin D, and Luff D eds, *The WTO and Global Convergence in Telecommunications and Audio-Visual Services* (Cambridge University Press 2004) 10 and 323.

⁵⁴ Ratliff and Rubinfeld posited that: “[...] these parties find themselves in a prisoners’ dilemma-like strategic situation in which they are likely to be worse off unless SEP-holders can credibly commit ex ante to restrain their ex post opportunism.” See Ratliff JD and Rubinfeld DL, ‘The Use and Threat of Injunctions in the RAND Context’ (2013) *J Comp. L & Econ* 1, 5.

1.5 Methodology and Limitations

This study focuses on the intersection of three main areas: intellectual property and competition law, and theories of regulation. In dealing with all the central and ancillary issues presented above, this study relies on primary and secondary sources reviewing EU legislation; statutes; case law; EU institutional and policy documents and reports; the Commission's approaches to date as well as the Commission's and European institutions' past efforts in relation to ICT standard setting; it further looks to the relevant academic legal and necessary economic literature to scrutinise the research question and to deduce arguments and recommendations.

In developing a theoretical framework of regulatory capture in the EU standardisation process, this study examines the relevant regulatory theories while the theoretical tools of economics, political and social sciences provide referential assistance. The aim of this study is to utilise these theories in order to identify an instance of regulatory capture in the context of European standardisation system.

Some terminological clarifications are further necessary. This study extensively examines the concepts of private and public interest in standard setting. Public interest is frequently intertwined with public policy objectives, and thus both concepts will be used as equivalents in this study. Generally, the public interest has its own weight in the Treaty on the Functioning of the European Union (TFEU)⁵⁵ and the Treaty on European Union (TEU),⁵⁶ functioning usually as an exception to the

⁵⁵ Article 36 of the Treaty on the Functioning of the European Union (TFEU).

⁵⁶ Article 3(3) Treaty on European Union provides: "The Union shall establish an internal market. It shall work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress,

principle of free trade or, in a more implicit manner, as a principle that aims to the well-being of the people of the Union.⁵⁷ In this study the term of public interest will be used in its narrower form rooted in the social policy and non-economic values of competition law.⁵⁸ Hence, the concepts of public interest in question will be congruous with the competition law standard of consumer welfare.⁵⁹

and a high level of protection and improvement of the quality of the environment. It shall promote scientific and technological advance.” This Article denotes the economic objective of the internal market as well as the long-term social welfare ensuring the well-being of the European Union as a whole as opposed to national and/or private interests. In accordance with Protocol 27 annexed to the Treaties, the internal market includes ‘a system ensuring that competition is not distorted’ as stated. Consolidated Version of the Treaty on European Union [2016] OJ C 202/13.

⁵⁷ Weatherill S, ‘Supply and Demand for Internal Market Regulation : Strategies, Preferences and Interpretation’, in Niamh Nic Shuibhne (ed.), *Regulating the Internal Market* (Cheltenham: Edward Elgar, 2006) 52 ; de Witte B, ‘Non-Market Values in Internal Market Legislation’, in Niamh Nic Shuibhne (ed.), *Regulating the Internal Market* (Cheltenham: Edward Elgar, 2006), 61- 86; Barnard C, ‘Derogations, Justifications and the Four Freedoms: Is State Interest really Protected?’ in Barnard C and Odudu O (eds), *The outer limits of European Union law* (Hart 2009), 273-305.

⁵⁸ Abrenica points out that: “[p]ublic interest considerations are written into competition law either as supplement to core economic goal of protecting and preserving competition, or as basis for overturning decisions that are based solely on the impact of market conduct on efficiency and competition.” See Abrenica JV, ‘Balancing Consumer Welfare and Public Interest in Competition Law Special Issue on Revisiting Exceptions under International Economic Law’ (2018) *Asian Journal of WTO and International Health Law and Policy* 443, 449-453; see also Leslie CR, ‘Antitrust Law as Public Interest Law Symposium: Business Law as Public Interest Law’ (2012) *UC Irvine Law Review* 885.

⁵⁹ Lianos I, ‘Some Reflections on the Question of the Goals of EU Competition Law’ (2013) *Centre for Law, Economics and Society*, 1, 31 available at <<http://dx.doi.org/10.2139/ssrn.2235875>> accessed on 1 September 2019; Witt AC, ‘Public Policy Goals Under EU Competition Law—Now is the Time to Set the House in Order’ (2012) 8 *European Competition Journal* 443; Townley C, *Article 81 EC and Public Policy* (Bloomsbury Publishing 2009); Nazzini R, *The Objective of Article 102’, The Foundations of European Union Competition Law* (Oxford University Press 2011) 118-119.

The CJEU has considered the concept of public interest in *TeliaSonera* where it examined the consumer welfare under the total welfare standard approach. In *TeliaSonera*, the CJEU reiterated the protection of consumers embedded into Article 102 TFEU: “Article 102 TFEU is one of the competition rules referred to in Article 3(1)(b) TFEU which are necessary for the functioning of that internal market [...] The function of those rules is precisely to prevent competition from being distorted to the detriment of the public interest, individual undertakings and consumers, thereby ensuring the well-being of the European Union. [...] Accordingly, Article 102 TFEU must be interpreted as referring not only to practices which may cause damage to consumers directly, but also to those which are detrimental to them through their impact on competition.” See Case C-52/09 *Konkurrensverket v TeliaSonera Sverige AB* [2011] (*TeliaSonera*), paras 20–24.

The consumer welfare standard noticeably comprises one of the main goals of the EU competition law.⁶⁰ Although this notion was borrowed from the economics,⁶¹ its application in the competition law context goes beyond the economic aspect to include not only the protection of consumers but also “fairness, plurality, democratic values and freedoms.”⁶² Therefore, the notion of public interest is considered as an element or part of the consumer welfare standard. Consumer welfare is contingent on effective competition.⁶³ The Commission, in its Article 102 TFEU ‘Guidance Paper’,⁶⁴ has, thus, used the consumer welfare standard and ‘theory of harm’ as

⁶⁰ European Commission, ‘Guidelines on the Application of Article 81(3) of the Treaty’ [2004] OJ C101/97, para.13; European Commission, Staff working paper on ‘Competition Policy 2011’ [2012] SWD (2012) 141 final.

Based on well-established precedent, the competition law protects not only consumer welfare “but also the structure of the market and, in so doing, competition as such.” See Case C-501/06 P *GlaxoSmithKline Services Unlimited v Commission and Others* [2009] ECR I-9291, para 63. See also Case C-8/08 *T-Mobile Netherlands and Others* [2009] ECR I-4529, paras 31, 36, 38-39; see also Council Regulation (EC) 1/2003 on the Implementation of the Rules on Competition Laid Down in Articles 81 and 82 of the Treaty [2003] OJ L1/1, Recital 9; European Commission, ‘Green Paper on Vertical Restraints in EC Competition Policy’ COM(96) 721 final, para 180.

Also, the consumer welfare standard encompasses the notion of ‘consumer well-being’ where the General Court noted that: “the ultimate purpose of the rules that seek to ensure that competition is not distorted in the internal market is to increase the well-being of consumers [...] Competition law and competition policy [...] have an undeniable impact on the specific economic interests of final customers who purchase goods or services.” See Joined Cases T-213/01 and T-214/01 *Osterreichische Postsparkasse and Bank für Arbeit und Wirtschaft v Commission* [2006] ECR II-1601, para 115. Further, the CJEU ruled that the harm stemming from anticompetitive practices could harm the consumer well-being directly or indirectly via the impact on competition. See Case C 209/10 *Post Danmark A/S v Konkurrenceradet* [2012] ECLI, para 20; Case C-52/09 *TeliaSonera Sverige* [2011] ECR I-527, para 24.

⁶¹ In economics, consumer welfare is strongly associated with consumer surplus which is the difference between the price that a consumer is willing to pay and the actual price. In contrast to consumer surplus there is the producer surplus, namely the difference between the price the producer is willing to sell a good and the actual price they receive. For a detailed analysis see: Motta M, ‘Competition Policy: History, Objectives, and the Law’ in Motta M (ed) *Competition Policy: Theory and Practice* (Cambridge University Press 2004) 1, 17-19; Daskalova VI, ‘Consumer welfare in EU competition law: what is it (not) about?’ (2015) 11 *Competition law review* 133, 136-141.

⁶² Reyna A, ‘The Shaping of a European Consumer Welfare Standard for the Digital Age’ (2019) 10 *Journal of European Competition Law & Practice* 1.

⁶³ See Case T-286/09, *Intel v Commission*, EU:T:2014:547, para 105; Case C-209/10, *Post Danmark I*, EU:C:2012:172, para 20; Case C-280/08 P, *Deutsche Telekom v Commission*, EU:C:2010:603, para 182.

⁶⁴ European Commission, ‘Guidance on the Commission’s enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings’ [2009] OJ C45/7.

a balancing test to determine when to intervene under Article 102 TFEU regarding anticompetitive foreclosure.⁶⁵ Importantly, the Commission in its Horizontal Guidelines regarding the standardisation agreements highlights that the enhancement of consumer welfare is a common objective shared between the IP laws and competition laws.⁶⁶ Thus, the aim of the EU standardisation process is to balance the opposing private interests in the standard making process to enhance social and consumer welfare, hence public interest, through the adoption of interoperability standards. Lastly, Chapter 3 provides the specific attributes of public interest in the context of standard setting.⁶⁷

The study, however, is subject to limitations. First, it will examine the FRAND licensing regime, but it will not endeavour to provide FRAND calculations nor examine any of these from an economic standpoint. Economists have developed different theories and models to identify what comprises a FRAND royalty rate. Including FRAND calculation within the confines of this study would have diluted the focus on all other areas which have been explored. Further, as the focus of this study is the European standardisation process, it will take due account of selected literature and examples regarding other jurisdictions, e.g. the US. However, it does not present itself as a comparative venture. The literature external to EU will be used to show

⁶⁵ Ibid para 19. More specifically, consumer welfare refers to both final consumers and consumers at the intermediate level as per Article 102 Guidance Paper. Regarding the Article 102 Guidance Paper see also Geradin D, 'Does the Guidance Paper on Article 102 Matter?' in Etro F and Kokkoris I (eds), *Competition Law and the Enforcement of Article 102* (Oxford University Press 2010) 45; and Waelbroeck D, 'The Assessment of Efficiencies under Article 102 and the Commission's Guidance Paper' in Etro F and Kokkoris I (eds), *Competition Law and the Enforcement of Article 102* (Oxford University Press 2010) 123.

⁶⁶ European Commission, 'Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-Operation Agreements' (2011) OJ C11/01 para 269.

⁶⁷ See 3.4.2.

how other systems are currently dealing with the problem of patent holdup and what mechanisms they have employed in order to deter these. But careful generalisations will be drawn where applicable to provide a broader picture.

Moreover, the literature has been selected based on the scope of the study filtering out those resources that are not causally linked to its hypothesis. For example, this study is not examining the literature on theories of patent hold-out, also known as reverse patent holdup.⁶⁸ Lastly, a main weakness of this study was the paucity of literature on empirical evidence of patent holdup. However, this is reconciled through empirical studies on strategic behaviour and the determinants of participation in the standard setting explored to support the analysis and the hypothesis of this study. Notwithstanding these limitations, the study builds the theoretical framework for capture in standard setting.

1.6 Structure of the Thesis

This thesis proceeds by way of four steps to test the hypothesis, which correspond with the four main chapters.

Chapter 2 examines thoroughly the issue of patent holdup in ICT standard setting. First, it delineates the concept of holdup that emerged in the theories of economics. Then, it discusses the variants of the ‘tragedy of the anti-commons’, ‘patent thickets’, and ‘royalty stacking’ which are linked with the ICT technologies incorporating patents. This is followed by an analysis of patent holdup on both, theoretical

⁶⁸ Patent holdout is the converse of patent holdup that occurs when a licensee refuses to negotiate on FRAND terms.

and empirical grounds. The Chapter then examines the regulatory, legislative, and judicial measures against patent holdup to date. Thus, ETSI policies, competition law framework and case law are critically examined to identify key loopholes in regulating opportunism in the EU ICT standard setting.

Chapter 3 synthesises the theoretical construct of regulatory capture in standard setting. First, it provides a historical overview of the inception of technical harmonisation in Europe as well as the transformation of the European governance in relation to standard setting. Then the Chapter looks at the co-regulatory regime of the EU standardisation process and links it with the agency theory. It goes on to examine the agency theory, i.e. the principal – agent model, an analysis that underpins the subsequent discussion of agency problem and capture. In so doing, it considers both public and private theories of regulation in outlining the main premises of market failure and capture. This Chapter concludes with the application of the agency problem and capture hypotheses to standard setting, generally, an analysis of how the ongoing deviation of the agent from the public interest, underlying standard setting, signals the capture by private self-interests.

The focus of Chapter 4 is on establishing the hypothesis of capture of ETSI, specifically. It employs the theoretical tools of regulatory capture analysed in Chapter 3 to establish the capture of ETSI by its members in the context of ‘tripartite capture model’. It considers first, in this Chapter, the ‘intra-capture’ of ETSI by its members. In this analysis, the assessment of ETSI’s regulatory mode, governance, decision-making, weighted voting system, and development of IPR Policy is important as these facilitate and illustrate how ETSI’s capture is perpetuated. The Chapter then considers another dimension of capture under the agency model, that

of ‘inter-capture’, i.e. the capture of the Commission by ETSI as a result of the intra-capture. To illustrate this, the study examines the nature of the inter-capture based on rationales of the agency problem. It argues that there exists an agency problem in the agency relationship between the Commission and ETSI based on the agency problem constructs of goal conflict, information asymmetries, moral hazard, and opportunistic holdup.

Chapter 5 then formulates practical proposals that could enable the effective modernisation of the co-regulatory regime in standard setting. It first analyses the Commission initiatives, to date, to tackle the various hurdles in EU standard setting. It, thereafter, examines alternative avenues to prevent capture through the ex ante regulatory and ex post competition law tools. It posits that, based on the ex ante intervention paradigm applied to the telecommunications sector, the Commission should propose a legislative revision and introduce accountability and oversight measures in the 1025/2012 Regulation on European Standardisation that could rectify the accountability deficit of ETSI, and could contribute to the policing of ETSI members, thereby mitigating the strategic and opportunistic behaviour.

Chapter 5 concludes with an ex post competition law approach to counter patent holdup and capture. This consists of the optional initiation of sector inquiry and the *ex officio* investigation of the ETSI IPR Policy. As a recommendation the study provides a draft manifesto of IPR policy recommendations that are applicable to ETSI providing a better protection against patent holdup. Another recommendation is that the ETSI weighted voting system should be replaced with a fairer one. The policy recommendations entail the consideration of public interest values as

articulated through the study. These recommendations can be used by policy-makers to safeguard the European standardisation system from patent holdup and capture.

The thesis endeavoured to state the law and developments as at 31 July 2019.

2 FRAMING PATENT HOLDUP

2.1 Introduction

This Chapter focuses on and analyses the emergence of patent holdup in theory as well as in practice in the EU standard setting context. The first part of this Chapter examines the development of and evaluates the patent holdup theory. In this regard, it demonstrates how the economic theory of holdup has been applied in the landscape of complex ICT technologies like that of standards. It then maps variant theories linked to the patent holdup in an effort to illustrate the linkage between these theories and the emergence of patent holdup issues in standard setting. Finally, it examines the debate generated around patent holdup theory on a theoretical and evidential basis.

The examination of these issues aims to identify concerns stemming from the standardisation policy and regulation, a framework found largely in EU competition law and ETSI Policies, examined respectively in the rest of this chapter. The second part of the Chapter considers the policies and the rules of ETSI applicable to its members in relation to the licensing of FRAND-encumbered SEPs; whereas, the third part delineates the competition law framework in relation to licensing, primarily as found in the Commission's 'Horizontal Guidelines'. Both address existing measures to tackle patent holdup via soft-law mechanisms. The last part of the Chapter considers the seminal case law and the steps taken by antitrust enforcement and the CJEU to mitigate abuse of dominance in standard setting. Finally, the ensuing

analysis will then pose the systemic regulatory gaps that leave the problem of patent holdup essentially unsolved leading to the deterioration of standard setting.

2.2 The Evolution of Patent Holdup

In economics, the holdup problem¹ is built on assumptions based on contract scenarios between trading parties.² Imperfect/incomplete bilateral contracts are a prerequisite for such scenarios wherein one party is vulnerable to post-contractual appropriation of quasi-rents due to opportunism of the other party. This is not only attributable to incomplete or ambiguous contractual elements,³ but rather, importantly, to opportunism which Williamson coined as “[s]elf-interest seeking with guile”.⁴ Holdup is an unanticipated and unscrupulous practice, or, in other words, ‘opportunistic surprise’, threatening with economic harm to a party that has made a sunk and relationship-specific investment.⁵ Therefore, three conditions should be

¹ The theory of holdup originates from neoclassical ‘contractual theories of the firm’ built on the seminal Coase’s theorem of ‘The Nature of the Firm’ and utilised by the well-established ‘Transaction Cost Economics’ (TCE) microeconomic theory applied in consideration of factors relevant to whether to source goods or services from the market or produce internally. See Coase RH, ‘The Nature of the Firm’ (1937) 4 *Economica* 386.

² See Williamson OE, *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting* (Free Press 1985); Klein B, Crawford RG and Alchian AA, ‘Vertical Integration, Appropriable Rents, and the Competitive Contracting Process’ (1978) 21 *Journal of Law & Economics* 297; Casadesus-Masanell R and Spulber DF, ‘The Fable of Fisher Body’ (2000) 43 *Journal of Law & Economics* 67.

³ Ellingsen T and Johannesson M, ‘Is There a Hold-Up Problem?’ (2004) 106 *The Scandinavian Journal of Economics* 475; Che Y-K and Sákovics J, ‘A Dynamic Theory of Holdup’ (2004) 72 *Econometrica* 1063; Klein B, ‘Transaction Cost Determinants of ‘Unfair’ Contractual Arrangements’ in Victor P Goldberg (ed), *Readings in the Economics of Contract Law* (Cambridge University Press 1982) 139.

⁴ *Supra* note 2 Williamson OE 61-63.

⁵ *ibid* 63; *Supra* note 3 in Klein B at 139; Smith DG, ‘Contracts as Organizations’ (2009) 51 *Arizona Law Review* 1.

met for a holdup to occur: i. a non-contractible sunk investment in specific assets for a future transaction; ii. an incomplete contract; and iii. ex post opportunism.⁶

In recent years, the mainstream theory of holdup has been applied to the SEP licensing of complex technologies in the ICT sector. Shapiro and Lemley first developed and applied the holdup theory to the licensing of SEPs.⁷ Shapiro also clearly identified the connection between patent holdup and Williamson's theory of holdup, highlighting: "[t]he economics of opportunism are well understood, and there is nothing at all exceptional about applying these ideas to patent licensing."⁸ Farrell and others too made clear the link between patent holdup and the mainstream economic theory of holdup, stating: "[b]ad behavior (such as deception) is not logically necessary for such inefficiency, but hold-up can powerfully reward deception and concealment. Emphasizing how parties may inefficiently seek hold-up power, Oliver Williamson famously described opportunism as "self-interest seeking with guile."⁹ The patent holdup theory is based on the hypothesis that SEP holders via strategic behaviour and opportunism aim at charging supra-FRAND licensing fees exceeding the true economic value of the SEP.

⁶ Supra note 2 Williamson; Klein B, 'Why Hold-Ups Occur: The Self-Enforcing Range of Contractual Relationships' (1996) 34 *Economic Inquiry* 444.

⁷ See Lemley MA and Shapiro C, 'Patent Holdup and Royalty Stacking' (2006) 85 *Texas Law Review* 1991.

⁸ See Shapiro C, 'Patent Reform: Aligning Reward and Contribution' (2007) 8 *Innovation Policy and the Economy* 111, 120. Also see Shapiro C, 'Setting Compatibility Standards: Cooperation or Collusion' in Dreyfuss RC and others (eds), *Expanding the Boundaries of Intellectual Property* (Oxford University Press 2001).

⁹ Farrell J and others, 'Standard Setting, Patents, and Hold-Up' (2007) 74 *Antitrust Law Journal* 603, 604 ("An enormous literature explores holdup as a market dysfunction, typically emphasizing the ways in which private firms can manage their affairs to avoid holdup or mitigate its effects. The classic reference in this literature is Oliver Williamson's 1985 book, *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting.*"); Kieff FS and Layne-Farrar A, 'Incentive Effects From Different Approaches to Holdup Mitigation Surrounding Patent Remedies and Standard-Setting Organizations' (2013) 9 *Journal of Competition Law & Economics* 1091.

Specifically, the holder of a patented technology essential to a standard seeks advantage in license negotiations post-standardisation with a potential licensee that has made financial commitments/investments to the standard, possibly meeting the above three criteria.¹⁰ The SEP holder exploits the added value that the patented technology acquires when it is included in the standard, on the one hand, and the lock-in effects,¹¹ on the other, from the fact that the manufacturer is already committed financially to the technology. As a result, SEP holders can leverage their market power, conferred by the inclusion of their technology into a standard, to holdup industry participants either by disclosing the existence of IPRs after the adoption of a technology into a standard (patent ambush) or by aggressively asserting their IPRs to block or delay the implementation of patented technologies. This is particularly problematic when a patent is declared essential based on strategic behaviour but bears no true technical value.¹² This behaviour is the equivalent of the deception that the economic theory of holdup mandates. Moreover, here, the principles of standard setting, i.e. openness, accessibility, and transparency, are undermined resulting in the increase of costs, restricted access to standards, and the creation of barriers to use and adopt formal standards.¹³

¹⁰ Ibid Farrel and others; Galetovic A, Haber S and Levine R, 'An Empirical Examination of Patent Holdup' (2015) 11 *Journal of Competition Law & Economics* 549, 557.

¹¹ Lock-in effects, within the context of standardisation, refer to a situation in which the manufacturers are dependent on the implementation of a standard due to the significant investment on sunk costs and product compliance foreclosing any possibility to easily adopt an alternative technical solution.

¹² This topic is discussed further in 4.2.2.3.

¹³ Bekkers R, Bongard R and Nuvolari A, 'An Empirical Study on the Determinants of Essential Patent Claims in Compatibility Standards' (2011) 40 *Research Policy* 1001, 1010. The topic of the principles of the EU standardisation process are discussed in 3.4.2.

Lemley and Shapiro have further linked holdup with the theoretical constructs of: ‘tragedy of the anti-commons’, ‘patent thickets’, and ‘royalty stacking’.¹⁴ These concepts, explored below, demonstrate that opportunism coupled with patent strategies have surfaced the susceptibility of the patent system to the inefficient licensing of complex technological inventions. The involvement of various technology contributors in the standardisation process creates hurdles to the licensing of SEPs since ICT standards often encompass a great number of, frequently patented and potentially overlapping, technological components, requiring standard implementers to acquire numerous licences in order to manufacture standard-compliant products. This has been the core of the ‘the tragedy of the anti-commons’ claim, where multiple SEP holders with monopoly power can assert monopoly rents resulting to a high cumulative royalty that increases the cost of products, reduces output, and harms consumers.¹⁵ The economic theory of the ‘tragedy of the anti-commons’, which has been the basis for the construction of patent thickets and royalty stacking theories in the area of complex technologies, is discussed in the next section to explore the concepts that complement the theory of patent holdup.

2.2.1 Tragedy of the Anti-commons

The established ‘tragedy of the commons’ economic theory posits that self-interest will lead to the depletion or overuse of a common or shared resource where

¹⁴ See supra note 7 Lemley MA and Shapiro C; Lemley MA and Shapiro C, ‘Reply Patent Holdup and Royalty Stacking’ (2007) 85 Texas Law Review 2163.

¹⁵ Galetovic A, Hafer S and Zaretzki L, ‘Is There an Anticommons Tragedy in the World Smartphone Industry?’ (2017) 32 Berkeley Technology Law Journal 1527, 1530-1531.

no one has the right to exclude another user or the incentive to conserve.¹⁶ In 1998, Heller posited an inverse, the ‘tragedy of the anti-commons’,¹⁷ that submits that the conflicting interests of various individuals with partial property rights, but the ability to exclude or block others from exercising their rights, may lead to an underuse of a valuable common resource.¹⁸

An application of this theory considered patents in a biomedical context. It concluded that innovation was impeded as upstream basic research moved from a government-sponsored ‘commons’ model with unpatented results freely available for the downstream (applied) product development to a ‘privatised’ model with patented upstream research. Here many owners held rights in previous discoveries that constituted obstacles to future research.¹⁹ Even where coordination of these rights is successful an anti-commons develops as it is difficult and slow. As Heller and Eisenberg explain: “[t]he tragedy of the anti-commons refers to the more complex obstacles that arise when a user needs access to multiple patented inputs to create a single useful product. Each upstream patent allows its owner to set up another tollbooth on the road to product development, adding to the cost and slowing the pace of downstream biomedical innovation.”²⁰

¹⁶ Hardin G, 'The Tragedy of the Commons' (1968) 162 Science 1243.

¹⁷ Heller MA, ‘The Tragedy of the Anticommons: Property in the Transition from Marx to Markets’ (1998) 111 Harvard Law Review 621.

¹⁸ *ibid*

¹⁹ Heller MA and Eisenberg RS, ‘Can Patents Deter Innovation? The Anticommons in Biomedical Research’ (1998) 280 Science (New York, NY) 698.

²⁰ *ibid* 699.

With complex downstream ICT products, like smartphones, there is clearly a need to access multiple patented inputs that enable the device to be built and interoperate with various networks and services. Thus, from a theoretical and practical standpoint the theory of anti-commons is applicable to ICT standard setting where a SEP holder can prevent a manufacturer from implementing a standard. The anti-commons theory served as the basis for the development of patent thickets and royalty stacking within the context of complex technologies as examined in the following section.

2.2.2 Patent Thickets and Royalty Stacking

While the theory of anti-commons has been challenged in light of limited empirical evidence,²¹ Shapiro applied a similar analytical framework to high-technology industries participating in standard setting, i.e. telecommunications, semiconductors, and computing, where innovation is cumulative and the patent ownership is dispersed, often with imprecise boundaries, fostering the development of ‘patent thickets’.²² As coined by Shapiro, these are: “[...] a dense web of overlapping

²¹ Epstein RA and Kuhlik B, ‘Is There a Biomedical Anticommons’ (2004) 27 Regulation 55; Kitch EW, ‘Comment on the Tragedy of the Anticommons in Biomedical Research’ (2003) 50 *Advances in genetics* 271, 272; Wagner RP, ‘Information Wants to Be Free: Intellectual Property and the Mythologies of Control’ (2003) 103 *Columbia Law Review* 995; Murray F and Stern S, ‘Do Formal Intellectual Property Rights Hinder the Free Flow of Scientific Knowledge?’ (2007) 63 *Journal of Economic Behavior & Organization* 648.

²² Shapiro C, ‘Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting’ (2000) 1 *Innovation Policy and the Economy* 119.

The notion of patent thickets is not a new one; it can be traced back 150 years where it was applied to sewing machine industry. See Mossoff A, ‘The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s’ (2011) 53 *Arizona Law Review* 165.

intellectual property rights that a company must hack its way through in order to actually commercialize new technology.”²³

The undesirable over-inclusion of patented technologies in a single standard could render the ‘essentiality’ of the patented technologies questionable while driving the licensing costs upwards. Importantly, the persistence of ‘patent thickets’ problem has not escaped ETSI General Assembly Chairman, Dirk Weiler’s²⁴ attention. He expressed concerns that there is “risk of complicating the solutions just for getting patented technology into the standard rather than to improve the standard”, adding that “no mechanism exists to determine whether a patent claim brings a standard forward (real innovation) or just tries to get a patent into the standard in order to make money.”²⁵

With patents, thickets comprise of clusters of multiple and complementary patents (components) that protect complex technologies.²⁶ These ‘patent clusters’ can rely on a single technology in a product for which manufacturers often must

²³ Ibid Shapiro C 120.

²⁴ ETSI, ‘ETSI General Assembly re-elects Dirk Weiler as Board Chairman’ (2017) available at <https://www.etsi.org/newsroom/news/1242-2017-11-news-etsi-general-assembly-reelects-dirk-weiler-as-board-chairman> accessed on 1 September 2019.

²⁵ Dirk Weiler, Standards related patent quality, A view from a standardisation organization, EC/EPO Workshop on ‘Tensions Between Intellectual Property Rights and Standardisation: Reasons and Remedies’ Brussels, November 22, 2010, presentation available at https://web.archive.org/web/20110318082847/http://ec.europa.eu/enterprise/sectors/ict/files/ict-policies/5_weiler_en.pdf accessed on 1 September 2019.

²⁶ European Commission, ‘Pharmaceutical Sector Inquiry - Preliminary Report (DG Competition Staff Working Paper)’ (2008) 1, 9 available at http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/preliminary_report.pdf accessed on 1 September 2019; Ganslandt M, ‘Intellectual Property Rights and Competition Policy’ in Keith EM (ed) *Intellectual Property, Growth and Trade*, vol 2 (Emerald Group Publishing Limited 2007) 233-261; Intellectual Property Office, ‘Patent Thickets: An Overview’ (2011) 1, 11 available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/312540/informatic-thickets.pdf accessed on 1 September 2019.

first acquire multiple licences, usually from different patent owners, in order to commercialise the product.²⁷ For example, with 3G wireless telecommunications, an evolving standard, over 4,000 patents were declared essential for 3G Wideband Code Division Multiple Access (WCDMA) – Universal Mobile Telecommunications Service (UMTS) standards.²⁸ Goodman and Myers found that over 7,000 SEPs are embedded into ETSI’s standards for Third Generation Partnership Project²⁹ (‘3GPP’ and ‘3GPP2’) technologies.³⁰ The latter study shows that these patents are clustered in 887 families with each family covering one invention. Also, while Qualcomm, Nokia, Ericsson, and Motorola, own three quarters of these patents, 41 different companies own over a thousand. These facts are indicative of the patent thickets interface between complex technologies and SEP licensing.

²⁷ Shapiro also comments that: “The danger of paying royalties to multiple patent owners is hardly a theoretical curiosity in industries such as semiconductors, in which many thousands of patents are issued each year and manufacturers can potentially infringe on hundreds of patents with a single product”. See supra note 22 Shapiro C.

²⁸ Tapia C, *Industrial Property Rights, Technical Standards and Licensing Practices (FRAND) in the Telecommunications Industry* (Köln: Carl Heymanns, 2010) 41-42.

More recently, Nokia has declared over 2,000 patent families to ETSI as essential for 5G. See Nokia, ‘Press Release: Nokia announces over 2,000 5G patent declarations’ available at <https://www.nokia.com/about-us/news/releases/2019/10/09/nokia-announces-over-2000-5g-patent-declarations/> accessed on 10 October 2019.

²⁹ Briefly, 3GPP is a collaborative alliance of seven standards organisation (The Association Of Radio Industries And Business, Japan (ARIB); The Alliance for Telecommunications Industry Solutions, USA (ATIS); China Communication Standards Association (CCSA); ETSI; Telecommunications Technology Association, Korea (TTA); Telecommunications Technology Committee, Japan (TTC); Telecommunications Standards Development Society, India (TSDI)) from three continents (North America, Europe, and Asia) emanated from ETSI’s Special Mobile Group with the responsibility to develop the Universal Mobile Telecommunications System (UMTS) standard (standard is generally known as W-CDMA). The UMTS standard is often combined with the Global System for Mobile (GSM) standard. The latter was the objective of the 3GPP alliance to create a worldwide standard for the next generation wireless telecommunications network.

³⁰ Goodman DJ and Myers RA, *3G Cellular Standards and Patents* (2005 International Conference on Wireless Networks, Communications and Mobile Computing).

The need for multiple licenses can result in the payment of correlative multiple royalties, or a ‘royalty stacking’ effect.³¹ The royalty stacking effect arises as ‘complements’ problem, identified by Cournot whereby each producer has a monopoly in its own single product that is useless unless used with the products of others, also similarly limited.³² The cumulative royalties each potentially greater than their economic value in light of holdup, as considered below, can also raise the overall manufacturing cost of the product. Thus, the manufacturing cost could be prohibitively high and unsustainable for a licensee, creating barriers for manufacturers to entry into a market.³³ Again, taking the example of 3G wireless telecommunica-

³¹ E Elhauge, ‘Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?’ (2008) 4 *Journal of Competition Law & Economics* 535; TF Cotter, ‘Patent Holdup, Patent Remedies, and Antitrust Responses’ (2009) 34 *The Journal of Corporate Law* 1151, 1160; supra note 9 Farrell J and others; supra note 7 Lemley MA and Shapiro C; GJ Sidak, ‘Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro’ (2008) 92 *Minnesota Law Review* 714; Geradin D and Rato M, ‘Can Standard-Setting Lead to Exploitative Abuse? A Dissonant View on Patent Hold-Up, Royalty Stacking and The Meaning of FRAND’ (2007) 3 *European Competition Journal* 101.

³² Cournot AA and Bacon NT, *Researches into The Mathematical Principles of The Theory of Wealth* (Macmillan 1897).

As explained by Lemley and Shapiro in this context: “The Cournot-complements effect arises when multiple input owners each charge more than marginal cost for their input, thereby raising the price of the downstream product and reducing sales of that product. Effectively, each input supplier imposes a negative externality on other suppliers when it raises its price, because this reduces the number of units of the downstream product that are sold. As a result, if multiple input owners each control an essential input and separately set their input prices, output is depressed even below the level that would be set by a vertically integrated monopolist.” supra note 7 Lemley MA and Shapiro C at 2013.

³³ Supra note 22 Shapiro C; Bessen JE, ‘Patent thickets: Strategic patenting of complex technologies’ (2003) available at <https://ssrn.com/abstract=327760> accessed on 1 September 2019 ; von Graevenitz G, Wagner S and Harhoff D, ‘How to Measure patent thickets — A novel approach’ (2011) 111 *Economics Letters* 6; Clarkson G and DeKorte D, ‘The Problem of Patent Thickets in Convergent Technologies’ (2006) 1093 *Annals of the New York Academy of Sciences* 180; European Patent Office (EPO) Economic and Scientific Advisory Board , *Workshop on Patent Thickets* (2012) available at [http://documents.epo.org/projects/baby-
lon/eponot.nsf/0/B58781F239B083CEC1257B190038E433/\\$FILE/workshop_patent_thickets_en.pdf](http://documents.epo.org/projects/baby-
lon/eponot.nsf/0/B58781F239B083CEC1257B190038E433/$FILE/workshop_patent_thickets_en.pdf) accessed on 1 September 2019; Geradin et al, ‘The Complements Problem within Standard Setting; Assessing the Evidence on Royalty Stacking’ (2008) 14 *Boston University Journal of Science & Technology Law* (2008) 144, 146; Elhauge E, ‘Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?’ (2008) 4 *Journal of Competition Law & Economics* 535.

tions standard, Lemley and Shapiro note that thousands of patents have been declared essential with the royalty fees estimated as high as 30% of the total price of each phone due to the royalty stacking effect.³⁴

That there is a potentially greater threat of patent thickets and royalty stacking in the context of ICT standard setting, where one patent complements the others, has been extensively discussed, accompanied by some empirical evidence.³⁵ Royalty stacking exacerbates the problem of patent holdup in standard setting.³⁶ This becomes evident where a downstream user, unaware of overlapping patent claims, has designed and made irreversible sunk costs (lock-in effect) for a product that infringes SEPs incorporated into a standard.³⁷

Although patent holdup and royalty stacking are distinct concepts, they are interconnected. The cumulative over-inclusion and over-declaration of patents into

³⁴ Supra note 7 Lemley MA and Shapiro C at 2026.

³⁵ Ziedonis R, 'Don't Fence Me In: Fragmented Markets for Technology and the Patent Acquisition Strategies of Firms' (2004) 50 *Management Science* 804; UK Intellectual Property Office Patent Informatics Team, 'Patent Thickets' (2011) available at <http://www.ipo.gov.uk/informatic-thickets.pdf> accessed on 1 September 2019; UK Intellectual Property Office Patent Informatics Team, 'Patent Thickets, Licensing and Standards' available at <https://webarchive.nationalarchives.gov.uk/20140603125148/http://www.ipo.gov.uk/ipreview-doc-aa.pdf> accessed on 1 September 2019; Hall BH, Graevenitz VG and Rosazza-Bondibene C, 'A Study of Patent Thickets' (UK Intellectual Property Office, 2013) 7 <http://www.ipo.gov.uk/ipresearch-thickets.pdf> 1 September 2019.

³⁶ Supra note 7 Lemley MA and Shapiro C at 1993.

³⁷ Ibid.

standards can allow the incorporation of technologies with questionable technological value to be identified as essential to a standard.³⁸ The potential of over-declaration contributes to a convoluted calculation of FRAND royalties.³⁹ This was raised in the *Unwired Planet* decision, where the court highlighted that:

[A] very significant reason why one cannot just count up declared patent families is recognition of the problem of over-declaration. There was no dispute this exists. The debate is as to its extent [...] Various studies have been done on over-declaration and rates of over-declaration quoted in the literature. Each side criticises the other's counting techniques [...] It is just too difficult.⁴⁰

In such cases, SEP users must license or cross-license SEP portfolios (normally consisting of a mixture of SEPs and non-SEPs) to overcome the risk of infringement regardless of the technological value of these patents.

The above theories delineate the issues of standard setting system in licensing complex standardised technologies. Patent holdup theorists have underscored the

³⁸ A further analysis of the value of patents declared essential to a standard follows in 4.2.2.3.

³⁹ Sidak JG, 'The Meaning of Frand, Part I: Royalties' (2013) 9 *Journal of Competition Law and Economics* 931; Layne-Farrar A and Wong-Ervin KW, '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 *Jindal Global Law Review* 127; Cotter TF, 'Comparative Law and Economics of Standard-Essential Patents and FRAND Royalties' (2013) 22 *Texas intellectual property Law Journal* 311; Ginsburg DH, Wong-Ervin K and Wright JD, 'The Troubling Use of Antitrust to Regulate FRAND Licensing' (2015) 10 *CPI Antitrust Chronicle* 2; Henningson K, 'Injunctions for Standard Essential Patents Under FRAND Commitment: A Balanced, Royalty-Oriented Approach' (2016) 47 *IIC - International Review of Intellectual Property and Competition Law* 438; Ghidini G and Trabucco G, 'Calculating FRAND Licensing Fees: A Proposal of Basic Pro-competitive Criteria' in Bharadwaj A and others (eds), *Complications and Quandaries in the ICT Sector: Standard Essential Patents and Competition Issues* (Springer Singapore 2018); Mesel ND, 'Interpreting the 'FRAND' in FRAND Licensing: Licensing and Competition Law Ramifications of the 2017 *Unwired Planet v Huawei* UK High Court Judgements' in Bharadwaj A and others (eds), *Multi-dimensional Approaches Towards New Technology: Insights on Innovation, Patents and Competition* (Springer Singapore 2018); Epstein RA and Kappos DJ, 'Legal remedies for patent infringement: from general principles to FRAND obligations for standard essential patents' (2013) 9 *Competition Policy International* 69.

⁴⁰ *Unwired Planet International v Huawei Technologies* [2017] High Court of Justice Chancery Division Patents Court [2017] EWHC 2988 (Pat) paras 200-201.

negative implications of patent holdup on innovation and consumer welfare in creating economic inefficiencies and misallocating resources.⁴¹ The excessive cost of SEP licencing could be transferred to consumers via increasing prices of the final products. Additionally, manufacturers could opt for technologies that are less costly, possibly obsolete or of a lower quality to avoid patent holdup engagement.⁴² Lastly, the threat of holdup in classic economic theory may trigger the institutional response of vertical integration.⁴³

The above indicates that ICT standards is an area replete with problems of thickets, royalty stacking, and over-inclusion of patents. This study considers these issues as factors that facilitate the emergence of patent holdup and strategic behaviour regarded as market failures. The next section discusses the criticism that the patent holdup theory has received by scholars mainly based on the belief that since there is lack of empirical evidence there is no such problem.

2.2.3 Criticism of Patent Holdup Theory

While patent holdup is an established and recognised concept among academics and competition authorities,⁴⁴ it is supported by limited empirical evidence.

⁴¹ Egan EJ and Teece DJ, 'Untangling the Patent Thicket Literature' (2015) 1, 12 available at <https://scholarship.rice.edu/bitstream/handle/1911/92003/McN-PatentThicket-Egan-092215.pdf?sequence=1&isAllowed=y> accessed on 1 September 2019.

⁴² Galetovic A, Haber S and Levine R, 'An Empirical Examination of Patent Holdup' (2015) 11 *Journal of Competition Law & Economics* 549, 557.

⁴³ *Ibid.* In other words, patent holdup could lead to vertical integration by purchasing all of the necessary SEPs resulting in increased manufacturing costs.

⁴⁴ As will be discussed later in section 2.3, the Commission has acknowledged the problem of patent holdup in its Horizontal Guidelines highlighting FRAND terms as the main prevention mechanism. See Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-Operation Agreements (the Horizontal Guidelines) [2011] OJ C11/01 para

As previously noted, many scholars have suggested that the patent holdup is merely a variant of the mainstream economic theory of holdup.⁴⁵ Some, however, have voiced considerable concerns about this theoretical model and have underlined the flaws and disparities between the patent holdup and the mainstream theory of holdup.

Galetovic and Haber in their paper, ‘The Fallacies of Patent Holdup Theory’, posit that the patent holdup theory has internal and empirical inconsistencies in combining the concepts of holdup and the exercise of market power.⁴⁶ The authors claim that these are two distinct economic mechanisms that mutually contradict each other if viewed under the long-run market equilibrium approach.⁴⁷ The exercise of market power can sustain a long-run equilibrium through reinvestment of downstream firms, while holdup damages the reinvestment process that instead lasts

284.; The European Competitiveness and Sustainable Industrial Policy Consortium, ‘Patents and Standards: A modern framework for IPR-based standardization’ (2014) 1; The European Commission, Communication on Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final.

Competition authorities from other jurisdictions have launched various policy initiatives: US Federal Trade Commission (FTC), ‘FTC Testifies Before Congress on Standard Essential Patents and How Patent “Hold-Up” Affects Competition’ (2013) available at <https://www.ftc.gov/news-events/press-releases/2013/07/ftc-testifies-congress-standard-essential-patents-how-patent-hold> accessed on 1 September 2019; FTC Commissioner Terrell McSweeney, ‘Holding the Line on Patent Holdup: Why Antitrust Enforcement Matters’ (2018) available at https://www.ftc.gov/system/files/documents/public-statements/1350033/mcsweeney_-_the_reality_of_patent_hold-up_3-21-18.pdf accessed on 1 September 2019; Japan Fair Trade Commission, ‘Partial Amendment of “Guidelines for the Use of Intellectual Property under the Antimonopoly Act’ (2016) available at <https://www.jftc.go.jp/en/pressreleases/yearly-2016/January/160121.html> accessed on 1 September 2019; Korea Fair Trade Commission, ‘Review Guidelines on Unfair Exercise of Intellectual Property Rights’ (2016).

⁴⁵ Shapiro C, ‘Patent Reform: Aligning Reward and Contribution’ (2007) 8 *Innovation Policy and the Economy* 111; *supra* note 7 Lemley MA and Shapiro C; Miller J, ‘Standard Setting, Patents, and Access Lock-In: RAND Licensing and the Theory of the Firm’ (2007) 40 *Indiana Law Review* 351; *supra* note 9 Farrell J and others at 604; *supra* note 9 Kieff FS and Layne-Farrar A.

⁴⁶ Galetovic A and Haber S, ‘The Fallacies of Patent Holdup Theory’ (2017) 13 *Journal of Competition Law & Economics* 1.

⁴⁷ *Ibid* 11.

only until the firm's capital wears out.⁴⁸ That justification leads to their three 'fundamental fallacies of patent holdup theory'.

First, the economic theory of holdup dictates that adaptation is the basic mechanism with which firms overcome holdup and restore equilibrium by making structural, contractual, and behavioural adjustments (e.g. vertical integration).⁴⁹ Conversely, adaptation is inapplicable in patent holdup scenarios after the post-standardisation phase, where the selection of the patented technologies and standard-specific investments have been made.⁵⁰ Galetovic and Haber emphasise that the element of opportunistic surprise is absent in patent holdup because manufacturers expect that there is a possibility to be held up by SEP holders especially when the negotiations for royalty rates are not agreed pre-standardisation process.⁵¹ This is in agreement with Epstein et al. who place significant emphasis on the omission of the requirement of guile in patent holdup theory, which is central, though, to Williamson's theory of holdup.⁵² They point out that SEP holders merely seek to recoup their investments on R&D even if through excessive royalty rate demands, hence, the alleged opportunism does not fit within the definition of 'guile' as it stands in the Transaction Cost Economics.⁵³ Denicolo et al suggested that R&D investment

⁴⁸ Ibid.

⁴⁹ *ibid* 21.

⁵⁰ *ibid* 21-22.

⁵¹ *Ibid* 24.

⁵² Epstein RA, Kieff FS and Spulber DF, 'The FTC, IP, and SSOs: Government Hold-Up Replacing Private Coordination' (2012) 8 *Journal of Competition Law and Economics* 1, 16.

⁵³ *Ibid*.

should be perceived as a sunk cost from the SEP holder's side and that both parties, i.e. SEP holder and user, could be "subject to a hold up problem."⁵⁴

Second, Galetovic and Haber pose that it is illogical to combine the concepts of patent holdup and royalty stacking.⁵⁵ Patent holdup requires the extortion of excessive royalty fees whereas royalty stacking requires the accumulation of multiple low individual royalty fees from different patent holders that share the surplus of patent users.⁵⁶ Therefore, according to their analysis, royalty stacking as a theory of harm is unsustainable when patent holdup occurs.⁵⁷

The third fallacy questions the increased market power which is accorded to SEP owners when their patents become part of a standard.⁵⁸ The authors claim that the charging of excessive royalty fees should not be considered an exercise of market power in a vacuum; rather, it should be considered whether it reflects the true value of the patented technology. Additionally, they counterargue that SEPs are inputs that do add value to the end-product and not to standards. SEPs compile a valuable technology and, thus, a valuable final product that meets consumer demand. Taking this into account, the value of the adopted standardised technologies cannot be equated with the excluded technologies as the former contribute to drastic innovation and not incremental improvements.

⁵⁴ Denicolò V and others, 'Revisiting Injunctive Relief: Interpreting eBay in High-Tech Industries with non-Practicing Patent Holders' (2008) 4 *Journal of Competition Law & Economics* 571, 594-595.

⁵⁵ *Supra* note 46 Galetovic A and Haber S.

⁵⁶ *Ibid* 28.

⁵⁷ *Ibid* 33.

⁵⁸ *Ibid* 34.

From a theoretical standpoint, Galetovic and Haber question the patent holdup theory and its relation to anticompetitive conduct. They posit that patent holdup should be replaced with a more concrete and robust theory that would provide insights as to “[...] how repeated play among technology developers, manufacturers, and other stakeholders gives rise to a set of self-enforcing, equilibrium incentives in which output increases, quality improves, prices fall, profit margins attract new entrants and incentivize R&D, patent holders charge royalties well below those predicted by monopoly theory, and consumer welfare increases over time.”⁵⁹ The scope of the paper was relatively narrow, being primarily concerned with the theoretical compatibility between the holdup theory and patent holdup theory. However, agreement with their contentions would undermine the core of patent holdup theory, i.e. opportunism. Opportunism should not be expected nor normalised as a business tactic in the SEP licensing context as the adoption of standards is based on the principle of accessibility and the FRAND scheme.

Despite these claimed weaknesses of the patent holdup theory, this study endorses and agrees with the theoretical underpinning of patent holdup. In the context of standard setting, opportunism is a core element of patent holdup aiming to shift, post-standardisation, the bargaining power towards the SEP holder’s side during the licensing negotiations of IPRs. Notwithstanding, the implications of patent holdup have been widely recognised not only by scholars but also by the competition authorities.

⁵⁹ Ibid 44.

2.2.4 Overview of Empirical Evidence of Patent Holdup

In addition to the noted criticisms of patent holdup theory at a theoretical level, only a small number of systematic empirical studies have examined patent holdup, focusing on the US. There are certain factors that contribute to the limited delivery of empirical evidence on patent holdup and serve to explain its scarcity. First, it would be not only greatly time but also resource demanding to collect and produce accurate empirical evidence for patent holdup. There are enormous numbers of SEP clusters and families, which include sub-clusters and sub-categories. Assessing the essentiality and true technical value of each patented technology is difficult and could make the examination unattainable. Second, a further hurdle is the multiplicity of licensors and licensees; and as a result, empirical studies only focus on the main actors in relation to a specific standard. Third, patent holdup is hard to capture as the negotiations between SEP licensors and licensees are usually conducted under strict confidentiality. Therefore, patent holdup becomes only apparent post negotiation when SEP holders bring a lawsuit before courts or willingly share business information. Although litigation rates could serve as some indication, actual patent holdup occurrence is hard to map for the above reasons.

One of the few systematic studies that provided some data on patent holdup was done by Gupta and Snyder.⁶⁰ They reviewed over 2,746 cases filed in the United States District Courts and at the International Trade Commission.⁶¹ Only a third of the cases, for which no injunctions or exclusionary orders were granted involved

⁶⁰ Gupta K and Snyder M, 'Smart Phone Litigation and Standard Essential Patents' (2014) Hoover IP² Working Paper Series 1.

⁶¹ Ibid.

SEPs, in contrast to those involving non-SEP technologies.⁶² They also found that the majority of the SEPs were related to 2G and 3G wireless telecommunications standard technologies, litigated against manufacturers who “were late and highly-successful entrants in the mobile wireless industry” while being “recent participants in the relevant standards bodies”.⁶³ They concluded that there is a mismatch between the theory of patent holdup and evidence with regard to SEP licensing without, though, rejecting the patent holdup hypothesis.⁶⁴

Another empirical study by Galetovic et al. examined the quality-adjusted prices among various SEP-reliant industries, including telephone equipment, for the period between 1997 and 2013.⁶⁵ They found that the prices of SEP-compliant products have fallen dramatically over time even compared to non-SEP-compliant products and the rate of innovation was not affected after the *eBay* case.⁶⁶

The above studies together question the occurrence of patent holdup in the US causing any actual detriment to manufacturers. Moreover, Galetovic et al presume that even if patent holdup exists, it did not affect market prices and the innovation rate, indicating that patent holdup is an issue that essentially is dealt with

⁶² Ibid.

⁶³ Ibid 23.

⁶⁴ Specifically, they posited that: “It has been argued that SEPs have a special position to exploit the downstream manufacturers, causing patent hold-up under the threat of seeking an injunction for patents that by definition cannot be designed around. Apart from the issue that not all SEPs, as the term is typically used, represent patents that are essential to the standards, the recent smart phone litigation cases reveal an interesting result: no injunctions or active exclusion orders were found for SEPs, compared to 16 patents unrelated to standards. This raises the question of whether the threat of injunction for SEPs can possibly be substantial enough to result in the alleged harms.” *ibid.*

⁶⁵ *Supra* note 10 Levine R, Haber S and Galetovic A 549.

⁶⁶ *Ibid* 553-554. Section 2.5 provides an overview on the *eBay* ruling.

market mechanisms between industry participants.⁶⁷ In contrast, the FTC Commissioner Mc Sweeney recently countered this, claiming that “there is ample evidence that patent holdup exists” based on the enforcement actions brought before the FTC, anecdotal evidence, and case law.⁶⁸

If there are limited empirical studies on patent holdup in the US, there are no empirical studies examining and analysing the magnitude of patent holdup in Europe. However, the European Commission has published a number of policy-oriented studies and a public consultation on ‘Patents and Standards’ from which a study was delivered.⁶⁹ These studies review the potential issues that stakeholders face in the standardisation process from a policy standpoint and provide better understanding of SEP licensing schemes and policy options that could prevent issues from emerging in standard setting.

It is notable that, in Europe, the industry has reacted to the problem of patent holdup and the unfair licensing of SEPs, and has formed the ‘Fair Standards Alliance’ (FSA) to ensure “an open and collaborative approach to the licensing of SEPs that are needed for the creation of the next generation of wireless technology products.”⁷⁰ The FSA indicates that it aims to “contribute to building a balanced framework for

⁶⁷ Supra note 10 Levine R, Haber S and Galetovic A at 572-573.

⁶⁸ McSweeney T, 'Holding the Line on Patent Holdup: Why Antitrust Enforcement Matters' available at <https://www.ftc.gov/public-statements/2018/03/holding-line-patent-holdup-why-antitrust-enforcement-matters> accessed 2018-03-21, 1, 4.

⁶⁹ Knut Blind and others, ‘Study on the Interplay between Standards and Intellectual Property Rights (IPRs) – Final Report’ (2011); The European Competitiveness and Sustainable Industrial Policy Consortium, ‘Patents and Standards: A modern framework for IPR-based standardization’ (2014); Régibeau P, Coninck RD and Zenger H, Transparency, Predictability, and Efficiency of SSO-based Standardization and SEP Licensing (2016); and Pohlmann T and Blind K, *Landscaping study on Standard Essential Patents (SEPs)* (IPlytics GmbH, Technical University of Berlin, 2016).

⁷⁰ Fair Standards Alliance (FSA) available at <https://fair-standards.org/about-us-2/> accessed on 1 September 2019.

sustainable licensing of standard essential patents that fosters creativity, innovation and job creation in Europe and beyond [...] as the European Commission advances its Digital Single Market objectives and as other policy makers around the world look into these issues.”⁷¹ The formation of this alliance by big-tech companies, such as Apple, Dell, Cisco, Google, Intel, and Microsoft, shows that even though patent holdup is not empirically proven, the problem exists and jeopardises the fair and reasonable licensing of SEPs, requiring FSA members’ joint efforts to combat unfair and unreasonable SEP licensing practices.⁷²

This section has shown the development of patent holdup as a theory, including that scholars have identified patent holdup in conjunction with the problems of patent thickets, royalty stacking and over-inclusion of patents in standard setting not only as obstacles to the efficient licensing of SEPs but also as crucial factors contributive to strategic and opportunistic behaviour. The primary criticism of patent holdup is largely based on the lack of empirical evidence. However, this study argues that there may be valid reasons for this scarcity, but in any case, patent holdup is an opportunistic conduct that arises and occurs in the EU standardisation system. This has been recognised not only by competition and judicial authorities but also by industry who have sought to address it for various reasons that will, in part be explored in this chapter. Specifically, in pursuit of a systematic approach to further unravel patent holdup and to identify policy and regulatory gaps in standard setting the remaining sections of this Chapter will examine the regulatory framework of

⁷¹ Ibid.

⁷² Fair Standards Alliance (FSA), ‘Fair Standards Alliance an Introduction’ available at <https://fair-standards.org/wp-content/uploads/2016/08/FSA-POSITION-PAPER-June2016.pdf> accessed on 1 September 2019.

ETSI IPR and antitrust policies, the EU competition law provisions, and relevant case law linked to patent holdup.

2.3 ETSI Policies

This section maps the policies of ETSI to tackle the tension between patents and standards, including its rules for SEP licensing and the competition law compliance. ETSI, as previously noted, a self-regulatory body, has a set of policies and rules of procedures comprised of formal documents, known as the ‘ETSI Directives’.⁷³ The ETSI Directives lay down requirements and policies that govern ETSI’s operations for the standardisation process. ‘ETSI IPR Policies’, ‘ETSI Guide on Intellectual Property Rights’ (IPR Guide), and ‘ETSI Guidelines for antitrust compliance’ (Antitrust Guidelines) setting out rights and obligations for ETSI members in terms of management and licensing of SEPs and compliance with competition law provisions, respectively.⁷⁴ In the section that follows, it will be argued that, despite these extensive policies, and in contrast to the Institute of Electrical and Electronic Engineers Standards Association (‘IEEE’) and CEN/CENELEC Workshop Agreement on best practices for SEP licensing, ETSI has not taken steps to protect the interests of SEP users, leaving them exposed to the risk of patent holdup.

⁷³ The history of ETSI, creation, significance and role in standard setting will be analysed in the subsequent Chapters 3 and 4.

⁷⁴ ETSI, ‘ETSI Rules of Procedure, Annex 6; European Telecommunications Standards Institution, ETSI Rules of Procedure, ETSI Guide on Intellectual Property Rights (IPRs)’; and ETSI, ‘ETSI Guidelines for Antitrust Compliance’ available https://portal.etsi.org/directives/40_directives_apr_2019.pdf accessed on 1 September 2019.

2.3.1 ETSI Intellectual Property Rights Policy

ETSI Intellectual Property Rights Policy, found in Annex 6 of ETSI Directives, has the key objective to ensure availability of essential IPRs to the preparation, adoption and application of standards.⁷⁵ To reinforce this objective, ETSI requires certain obligations to be followed by ETSI members. First, members must inform ETSI of any essential IPRs involved in the standardisation process.⁷⁶ Nevertheless, this requirement does not entail any responsibility for IPR searches, thus, members are not obliged to conduct a search for patents declared essential before the development of a standard. Second, following the disclosure of essential IPRs, the members are requested within three months to grant licences on irrevocable FRAND terms and conditions.⁷⁷ ETSI FRAND licensing commitments are transferable to any future successors of essential IPRs.⁷⁸ This requirement reflects the intention of ETSI to create a continuum of the FRAND licensing scheme to preserve availability of essential IPRs despite the transfer of the ownership. When an owner, however, disregards FRAND commitments the ETSI General Assembly may remove the IPR

⁷⁵ ETSI, 'ETSI Rules of Procedure, Annex 6: ETSI Intellectual Property Rights Policy' Section 3.1: "It is ETSI's objective to create STANDARDS and TECHNICAL SPECIFICATIONS that are based on solutions which best meet the technical objectives of the European telecommunications sector, as defined by the General Assembly. In order to further this objective the ETSI IPR POLICY seeks to reduce the risk to ETSI, MEMBERS, and others applying ETSI STANDARDS and TECHNICAL SPECIFICATIONS, that investment in the preparation, adoption and application of STANDARDS could be wasted as a result of an ESSENTIAL IPR for a STANDARD or TECHNICAL SPECIFICATION being unavailable. In achieving this objective, the ETSI IPR POLICY seeks a balance between the needs of standardization for public use in the field of telecommunications and the rights of the owners of IPRs."

⁷⁶ Ibid Section 4.

⁷⁷ Ibid Section 6.

⁷⁸ Ibid.

from the standard with a weighted vote, thereby voiding the ‘essential’ character of that particular IPR.⁷⁹

In addition to ETSI IPRs Policy, the Guide on IPRs provides insights into the policy.⁸⁰ The Guide’s Background section delineates revisions that the ETSI IPRs policy has undergone over time in order to minimise the tension between IPRs and standards, and to safeguard standard setting against possible anticompetitive actions, including patent ambush concerns. The Guide denotes two issues that arise from late disclosure: “[l]icenses for Patents which have been disclosed late and are not available at all, or, [l]icenses for Patents which have been disclosed late and which are available, but not on Fair, Reasonable and Non-Discriminatory (FRAND) terms, i.e. the company is unwilling to make a "FRAND" undertaking/licensing declaration.”⁸¹ Per the Guide, failure to resolve these issues may force ETSI to change the standard even start the development of a new standard to circumvent the unavailable IPR that blocks the implementation of the standard.⁸² Therefore, timely disclosure of essential patents is important not only to keep standards available once they are developed but also to avoid dissipation of resources and time due to IPR constraints.

⁷⁹ Ibid.

⁸⁰ ETSI, ‘ETSI Rules of Procedure: ETSI Guide on Intellectual Property Rights (IPRs)’.

⁸¹ Ibid section 2.

⁸² Ibid.

2.3.2 FRAND Terms: ETSI v IEEE

Unsurprisingly, ETSI like many SDOs does not seek to define the meaning of FRAND commitments. The irony here is that while FRAND commitments are of paramount importance in the ETSI standardisation process and the licensing of SEPs, nevertheless, they still lack definition. Scholars have underscored the conflicts created because of the vagueness of these terms.⁸³ In contrast to ETSI, and in light of the risk of patent holdup, the Institute of Electrical and Electronic Engineers Standards Association (IEEE) amended its IPRs Policy, with effect from 2015, and clarified the meaning of FRAND terms to strike a better balance between SEP holders' and implementers' interests.

IEEE also introduced a FRAND definition to provide clearer and improved policy requirements for licensing negotiations to speed the process, limit litigation, and hamper patent holdup. Also, it has been noted that IEEE was the only SSO to

⁸³ Blind K and Pohlmann T, 'Trends in the interplay of IPR and standards, FRAND commitments and SEP litigation' (2013) 37 *Praxis der Informationsverarbeitung und Kommunikation* 189, 192; Layne-Farrar A, Padilla AJ and Schmalensee R, 'Pricing Patents For Licensing In Standard-Setting Organizations: Making Sense Of Frand Commitments' (2007) 74 *Antitrust Law Journal* 671; Treacy P and Lawrance S, 'FRANDly Fire: Are Industry Standards Doing More Harm than Good?' (2007) 3 *Journal of Intellectual Property Law & Practice* 22, 27; Weber RH, 'Competition Law versus FRAND Terms in IT Markets' (2011) *World Competition* 51, 56-60; Kuhn K-U, Morton FS and Shelanski H, 'Standard Setting Organizations Can Help Solve the Standard Essential Patents Licensing Problem' (2013) *CPI Antitrust Chronicle* 1, 3-4; Mariniello M, 'Fair, Reasonable and Non-Discriminatory (FRAND) Terms: a Challenge for Competition Authorities' (2011) 7 *Journal of Competition Law and Economics* 523.

Bekkers and Updegrave submitted that: "[d]espite the fact that the concept of RAND terms is central to many IPR policies, it is remarkable that none of the policies in the study set provides a definition, or any guidance on how abstract concepts as 'reasonable' or 'non-discriminatory' are to be understood. The same holds true with respect to the word 'fair' in policies that speak of FRAND, or even what, if anything, is intended by adding the word fair in addition to the word 'reasonable'. Suffice it say that if any differentiation was ever intended (which is doubtful), that wisdom has been lost in the sands of time." See Bekkers R and Updegrave AS, *IPR Policies and Practices of a Representative Group of Standards-Setting Organizations Worldwide* (Committee on Intellectual Property Management in Standard-Setting Processes National Research Council, Washington, DC, 2013) 1, 129 available at https://www.nap.edu/resource/18510/Bekkers-Updegrave%20Paper_092013.pdf accessed on 1 September 2019.

change its IPRs Policy to provide a clearer meaning of FRAND terms and to “protect implementers against the risk of [patent] holdup... [.]”⁸⁴

The process leading to the Patent Policy update involved the creation of an *ad hoc* committee by the IEEE Patent Committee (PatCom) and an online public review where 680 comments were made, followed by a series of appeals by technology contributors members of the organisation.⁸⁵ The updated Patent Policy and definitions address the vagueness of FRAND terms, providing a set of rules for the parties to negotiating FRAND licences. Specifically, section 6 of ‘IEEE Standards Board Bylaws’ provide for appropriate compensation based on several identified non-exclusive value considerations but not including the value of being declared part of the standard. It specifically states that:

Reasonable rate shall mean appropriate compensation to the patent holder for the practice of an Essential Patent Claim excluding the value, if any, resulting from the inclusion of that Essential Patent Claim's technology in the IEEE Standard. In addition, determination of such Reasonable Rates should include, but need not be limited to, the consideration of:

- The value that the functionality of the claimed invention or inventive feature within the Essential Patent Claim contributes to the value of the relevant functionality of the *smallest saleable* Compliant Implementation that practices the Essential Patent Claim.
- The value that the Essential Patent Claim contributes to the smallest saleable Compliant Implementation

⁸⁴ Letter from Michael A. Lindsay to the Honorable William J. Baer, Assistant Attorney General, U.S. Department of Justice, 7 November 2014, 1, 2 in Taffet R and Harris P, ‘Standards and Intellectual Property Rights Policies’ in Drapkin ML, *Patents And Standards : Practice, Policy, and Enforcement* (BNA Books 2018), 4-8.

⁸⁵ For a detailed analysis of the proceedings see: Zingales N and Kanevskaia O, ‘The IEEE-SA Patent Policy Update under the Lens of EU Competition Law’ (2016) 12 *European Competition Journal* 195, 212-217.

that practices that claim, in light of the value contributed by all Essential Patent Claims for the same IEEE Standard practiced in that Compliant Implementation.

- Existing licenses covering use of the Essential Patent Claim, where such licenses were not obtained under the explicit or implicit threat of a Prohibitive Order, and where the circumstances and resulting licenses are otherwise sufficiently *comparable* to the circumstances of the contemplated license.⁸⁶ (emphasis added)

The updated policy, however, does not employ any calculation methodology nor specific royalty rates.

Additional patent holdup protections are found in two further provisions. First, the policy allows ‘reciprocal licensing’ or grant back of a licence for the same standard.⁸⁷ This measure mitigates the risk of patent holdup, especially when a technology contributor engages opportunistically against others who made FRAND commitments for the same standard in case of cross-licensing of SEPs or non-SEPs. Second and remarkably, the new provisions of the Patent Policy preclude IEEE members and SEP holders from seeking injunctions:

The Submitter of an Accepted LOA who has committed to make available a license for one or more Essential Patent Claims agrees that *it shall neither seek nor seek to enforce a Prohibitive Order* based on such Essential Patent Claim(s) in a jurisdiction unless [...] to: determine Reasonable Rates and other reasonable terms and conditions; adjudicate patent validity, enforceability, essentiality, and infringement; award monetary damages; and resolve any defenses and counterclaims. [...] ⁸⁸ (emphasis added)

⁸⁶ IEEE, ‘IEEE-SA Standards Board Bylaws’, Section 6: Patents (2017), 1, 15-16 available at http://standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf accessed 1 September 2019.

⁸⁷ Ibid.

⁸⁸ *ibid* 18.

The revision of IEEE's Patent Policy has been subject to considerable discussion and critique. In its Business Review Letter,⁸⁹ the US Department of Justice (DoJ) endorsed the revised approach, stating that: "[t]his provision aligns with generally accepted goals of RAND commitments, namely, providing the patent owner with appropriate compensation, while assuring implementers that they will not have to pay any hold-up value connected with the standardization process."⁹⁰ A number of scholars, however, voiced concerns that although the Policy changes took measures against patent holdup, they nevertheless promptly backfired.⁹¹ According to Katznelson's empirical study, the updated Policy negatively impacted the standard setting of IEEE as key members and industry participants reacted against the change and opposed the new Patent Policy by submitting negative Letters of Assurance (LOA), i.e. unwillingness to license under the new policy. In this respect, the decline of positive LOAs was attributed to the Patent Policy, and particularly, the negative

⁸⁹ Requests submitted to the Department of Justice are made in order to receive approval about the legality under the US antitrust law of the proposed business conduct (negative clearance).

⁹⁰ Business Review Letter to the Institute of Electrical and Electronics Engineers (2 February 2015) available at <http://www.justice.gov/atr/public/busreview/311470.htm> accessed on 1 September 2019.

⁹¹ Katznelson RD, 'The IEEE controversial policy on Standard Essential Patents – the empirical record since adoption' (Symposium on Antitrust, Standard Essential Patents, and the Fallacy of the Anticommons Tragedy, Berkeley, CA, 2016); Katznelson RD, 'Perilous deviations from FRAND harmony- operational pitfalls of the 2015 IEEE patent policy' (2015 IEEE 9th International Conference on Standardization and Innovation in Information Technology (SIIT), 2015; Teece DJ and Sherry EF, 'The IEEE's New IPR Policy: Did the IEEE Shoot Itself in the Foot and Harm Innovation' (2016) available at <http://businessinnovation.berkeley.edu/wp-content/uploads/2014/07/14-The-IEEES-New-Policy-Teece-Sherry-8-3-16-2-Clean.pdf> accessed on 1 September 2019; Sidak JG, 'Antitrust and the IEEE's Bylaw Amendments' (IEEE's 9th International Conference on Standardization and Innovation in Information Technology) available at <https://www.criterioneconomics.com/antitrust-and-the-ieee-bylaw-amendments-2015-ieee-siit-speech.html> accessed on 1 September 2019; Petit N, 'The IEEE-SA Revised Patent Policy and Its Definition of 'Reasonable' Rates: A Transatlantic Antitrust Divide?' (2016) 27 Fordham Intellectual Property, Media & Entertainment Law Journal 211; Sidak JG, 'The Antitrust Division's Devaluation of Standard-Essential Patents' (2016) 104 Georgetown Law Journal Online 48; Bharadwaj A and Singh M, 'A Single Spark Can Start a Prairie Fire: Implication of the 2015 Amendments to IEEE-SA's Patent Policy' (2018) Capital University Law Review 583; Katznelson RD, 'Comments on the IEEE PatCom's Proposal to Accept LOAs under two Distinct Patent Policies' (2018) available at <https://works.bepress.com/rkatznelson/86/download/> accessed on 1 September 2019.

LOAs reached 53.2% of the total LOAs submitted to IEEE, and particularly for IEEE 802.11 (Wi-Fi) standard they counted 73.3%.⁹²

Three more recent empirical studies by IPlytics offer important insights about the decline in submitted positive LOAs.⁹³ The studies show that technical contributions submitted to IEEE were not diminished by the recent patent policy update. Also, the studies challenge opponents' findings while highlighting that they are based on methodologically flawed approaches, i.e. the counting of specific patent declarations based on LOAs, however, excluding patents submitted using blanket declarations; hence, producing inaccurate and misleading results.⁹⁴

The first study found that more standards were approved post-patent policy update than before with a historical high in 2015.⁹⁵ Particularly, it shows that the decline of LOAs, noticed in 2016, was "more attributable to IEEE workflow issues than to any issues relating to the change in its patent policy."⁹⁶ In addition to the first study and in a complementary manner, the second study focuses on the LOA metrics and reveals that only a minority of five companies, namely Nokia (including its subsidiary Alcatel-Lucent), InterDigital, Orange (France Telekom) and Ericsson, responsible for about 4.5% of the overall technical contributions to the standards,

⁹² See Katznelson RD, 'The IEEE controversial policy on Standard Essential Patents – the empirical record since adoption' (Symposium on Antitrust, Standard Essential Patents, and the Fallacy of the Anticommons Tragedy, Berkeley, CA, 2016) available <https://works.bepress.com/rkatznelson/80/download/> accessed 1 September 2019; Taffet R and Harris P, 'Standards and Intellectual Property Rights Policies' in Drapkin ML, *Patents And Standards : Practice, Policy, and Enforcement* (BNA Books 2018) 1, 4-9.

⁹³ IPlytics, 'Empirical study on patenting and standardization activities at IEEE' (2017); and IPlytics, 'IEEE's Empirical Record of Success and Innovation Following Patent Policy Updates' (2018). The second study complements the first providing further insights; IPlytics, 'Empirical Analysis of Technical Contributions to IEEE 802 Standards' (2019).

⁹⁴ IPlytics (2017) 1, 7.

⁹⁵ Ibid 13.

⁹⁶ IPlytics (2017) 1, 12.

submitted negative LOAs following the revision of the policy for patent licensing.⁹⁷ The study, instead, shows that the technical contributions reached a historic peak in 2017 by the top five technical contributors, namely Qualcomm, Intel, Huawei, Newracom and Broadcom.⁹⁸ Also, the study clarifies that many technological submissions are based either on blanket declarations or on earlier LOAs, and thus characterised opponents' findings regarding the decreasing rate of LOAs largely meaningless.⁹⁹ In a continuation of the previous evaluation, IPlytics, in its third study, reaffirms that the technical contribution levels of IEEE 802.11 standard in 2018 have continued to grow reaching another historical high; thus, rejecting allegations of negative impact on standards development post patent policy update.¹⁰⁰ Lastly, these studies together claim that IEEE standardisation work remains healthy and successful and continues to thrive without any negative effects by the policy updates.

The above outcomes contrast with those of Gupta's and Effraimidis' that found the steep decrease, i.e. 91%, in the submission of positive LOAs, was attributable to the unwillingness of the SEP holders to license under the new terms; and that there has been a substantial delay in the approval of standards.¹⁰¹ In contrast to the IPlytics studies, Gupta and Effraimidis focused on IP-intensive projects. They posited that:

[s]uch unwillingness from SEP holders can have a potential adverse impact on the standards development process. The uncertainty on the SEP implementers' side will increase, as

⁹⁷ IPlytics (2018) 1, 9-10.

⁹⁸ Ibid.

⁹⁹ Ibid 15-17.

¹⁰⁰ IPlytics (2019) 1, 7-9.

¹⁰¹ Gupta K and Effraimidis G, 'IEEE Patent Policy Revisions: An Empirical Examination of Impact' (2018) <https://papers.ssrn.com/abstract=3173799> accessed on 1 September 2019.

it will not be clear to them whether the SEPs at issue should be licensed under the new or old policy. Consequently, the licensing negotiations between SEP holders and implementers will be distorted resulting in a highly inefficient negotiation process.¹⁰²

Despite the criticisms of the recent revised IEEE policies, the new provisions are exemplary. The organisation, which is one of the largest technical professional organisations with more than 422,000 members worldwide, introduced new IEEE patent policies to deal with the ex post opportunism created from indeterminate FRAND terms and the rising opportunism in standard setting. Although it is still early days for determining whether the new policies cause positive or negative results for innovation and standardisation process, there has been an opposition by some members regarding these changes.¹⁰³ This reaction suggests that industry participants benefited from the previous policies.

The IEEE is not the only standards body seeking to rein in holdup via positive actions. In Europe, the two other ESOs, CEN and CENELEC, have teamed up with the Fair Standards Alliance (FSA) and the Association for Competitive Technology (ACT). They have recently delivered and adopted a Workshop Agreement (CWA) that sets out six core principles of FRAND licensing practices that their members

¹⁰² Ibid 27-28.

¹⁰³ Huawei, 'Huawei Reassures Licensing Commitment Regarding Certain IEEE Standards' available at <https://www.huawei.com/en/about-huawei/declarations/huawei-reassures-licensing-commitment-regarding-ieee> accessed on 1 September 2019; Newman M and Crofts L, 'Alcatel-Lucent, Ericsson, Qualcomm's Challenge to IEEE Accreditation Fails' available at <https://mlexmarketing.com/insights-center/editors-picks/antitrust/north-america/alcatel-lucent-ericsson-qual-comms-challenge-to-ieee-accreditation-fails> accessed on 1 September 2019.

could adopt.¹⁰⁴ These principles, however, serve only as a guidance for “best practice” in the licensing of SEPs, but they can be summarised as follows:

- i. SEP holders should not enforce injunctions to threaten or hold up; they are allowed to use these only in exceptional circumstances and only where FRAND compensation cannot be addressed via adjudication;
- ii. FRAND licences should be granted to all for the implementation of the relevant standard;
- iii. SEPs should be valued based on their own technical merits and scope, such as the smallest component valuation, but not based on downstream values or uses;
- iv. SEP licensing should not be denied if there is disagreement on non-essential patent in the licensing process of patent portfolios;
- v. overbroad secrecy arrangements are precluded in FRAND negotiations supporting the public interest in consistent and fair application of FRAND; and,
- vi. FRAND obligations should not be disturbed even in case of patent transfers, and patent sales transactions.¹⁰⁵

These core principles aim to offer a balanced context between the parties contributing to the prevention of patent holdup. Indeed, the principles essentially restrict

¹⁰⁴ The CEN and CENELEC Workshop, ‘Core Principles and Approaches for Licensing of Standard - CWA 95000’ (2019) ftp://ftp.cencenelec.eu/EN/News/WS/2019/CWA_SEP/CWA95000.pdf accessed on 1 September 2019.

¹⁰⁵ Ibid 9-10.

SEP holders to behave opportunistically during the negotiations phase, thereby addressing the potential of patent holdup at its core. It is apparent, therefore, that the aim of these principles is to safeguard fair licensing of SEPs and encourage the application of FRAND premised on best practices.

The above approaches of IEEE and CEN/CENELEC to the FRAND licencing framework illustrate that there are avenues that an SDO could pursue to put forward policies that would benefit the innovation and standardisation process as well as respect the public interest and consumers. As shown in this section, ETSI IPRs Policy and Guide does little to mitigate patent holdup with its existing provisions in contrast to its counterpart ESOs. Interestingly, ETSI did not participate in the CEN/CENELEC Workshop Agreement. Why this was so should be viewed with a critical eye. As will be explored later in this chapter, the vagueness of the FRAND framework has been a factor contributing to increased SEP litigation as well as to anticompetitive conduct. The next section, first, discusses the current ETSI provisions on the ex ante disclosure of licensing terms and the reason they have been added to the policy.

2.3.3 Ex Ante Disclosure of Licensing Terms

Ex ante disclosure of licensing terms is not prohibited under ETSI. However, per ETSI's Guide on IPRs, negotiations over licensing terms should not be addressed within the institution as they are considered to be commercial issues that could significantly "complicate, delay or derail" the standards making process.¹⁰⁶ ETSI can,

¹⁰⁶ Ibid section 4.1.

therefore, only facilitate the distribution of disclosed licensing terms between members, acting as a depository and without obliging its members to disclose any licensing terms.¹⁰⁷

The requirement of disclosure of essential IPRs in a timely fashion was essentially deployed after the intervention of the EC DG Competition, which launched an investigation into ETSI's IPR policies.¹⁰⁸ In its press release the Commission stated that it was prompted by: “[...] concerns that these rules did not sufficiently protect against the risk of ‘patent ambush’ during ETSI standard-setting procedures.”¹⁰⁹ In light of patent ambush phenomena, the Directorate-General for Competition (EC DG Competition) requested the prompt identification and declaration of essential IPRs and, thus, urged ETSI to amend the wording of its IPR Policy to stipulate speedy disclosure of essential IPRs without requiring members to perform IPR searches.¹¹⁰ As further noted by the Commission: “[a]t its General Assembly of 22 November 2005, ETSI unanimously approved changes to its standard-setting rules which the Commission had put forward, and which minimise the risk of patent ambush occurring.”¹¹¹

The target of ETSI's IPRs Policy and Guide on IPRs is manifestly to safeguard the seamless adoption of standards. In order to achieve that, ETSI in addition to this

¹⁰⁷ Ibid.

¹⁰⁸ Ibid section 4.6 onwards.

¹⁰⁹ European Commission, Press Release on ‘Competition: Commission Welcomes Changes ETSI IPR Rules to Prevent ‘Patent Ambush’ (2005), IP/05/1565, 12 December 2005.

¹¹⁰ Ibid.

¹¹¹ Ibid.

upfront disclosure of any essential IPRS, also requires members to commit to granting FRAND licences subsequent to the completion of the standard making process. Considering the above, although patent ambush issues have been dealt effectively with the disclosure and FRAND commitment requirements, since 2005, these however do not seem to be the remedy for patent holdup.

This study will later show how the declaration of essential patents may facilitate the strategic inclusion and over-inclusion of patents into a standard to gain the essentiality status and, thereby, increase their licensing value.¹¹² Chapter 5 will, however, then consider how existing ETSI provisions on ex ante disclosure of licensing terms could be fine-tuned to provide a better and more effective protection against strategic behaviour allowing the ex ante disclosure of maximum royalty rates. The following section, however, continues with the discussion on mapping the ETSI Policies and overviews the ETSI Antitrust Guidelines provided to its members for conduct that is compliant to the competition laws.

2.3.4 ETSI Guidelines for Antitrust Compliance

ETSI Guidelines for Antitrust Compliance provide background on competition law provisions and antitrust liability if violation of Articles 101 and 102 TFEU is determined. ETSI, in spite of being an official standardisation body, acts as an

¹¹² See 4.2.2.3

association of undertakings, therefore, the activities of the institution and its members are not excluded from competition law scrutiny.¹¹³ ETSI Antitrust Guidelines (Antitrust Guidelines) indicate that ETSI members should not abuse their participation to establish restrictive agreements that impair competition.¹¹⁴

Further, they set out examples of anticompetitive agreements and abuse of dominant position in the context of ETSI activities.¹¹⁵ Using the example of restrictions in licenses of IPRs, they explain that “[o]bligations of bi- or multilateral exchanges of intellectual property rights might in some specific cases come under Article 101(1) TFEU. In cases where such exchanges of intellectual property rights evolve to a patent pool, Article 101(1) TFEU can become even more relevant.”¹¹⁶ This is particularly important as the development of standards between competing technology consortia or pools could give rise to anticompetitive effects. Therefore, access to IPRs is fundamental to not foreclose market entry to industry participants. For example, that issue was a factor in the case of the 3G Patent Platform Partnership

¹¹³ Associations of undertakings do not escape Article 101 of TFEU even if they do not have a profit-motive or economic purpose. See Whish R and Bailey D, *Competition law* (Ninth edition edn, Oxford University Press 2018) 1, 92-93; Case COMP/E-2/37.857 *Organic Peroxides* [2003] European Commission Decision 4570 final paras 331–349 ; Case T-99/04 *AC-Treuhand v Commission* [2008] ECR II-1501, [2008] 5 CMLR 962; Case C-222/04 *Cassa di Risparmio di Firenze* [2006] ECR I-289, [2008] 1 CMLR 705, paras 111–113; Case 37.576 *UEFA’s Broadcasting Regulations* [2001] OJ L 171/12, paras 43-47; Cases T-25/95 *Cimenteries CBR SA v Commission* [2000] ECR II- 491, [2000] 5 CMLR 204, para 1320.

¹¹⁴ ETSI, ‘ETSI Guidelines for Antitrust Compliance’ Section B.2.2.

¹¹⁵ *Ibid* section B.2.5 and B.3.3.

¹¹⁶ *Ibid* Section B.2.5.

(3GPPP), where the Commission granted negative clearance to a set of agreements for a better access to SEPs.¹¹⁷

The Antitrust Guidelines then analyse the application of Art 102 TFEU and provide examples of abusive conduct by dominant undertakings.¹¹⁸ Following the principles of competition law, the Antitrust Guidelines point out that a prospective refusal by a dominant undertaking to licence IPRs indispensable to enter the market could amount to an abuse of dominance when it is not objectively justified.¹¹⁹ Further guidance is provided that antitrust compliance requires fair admission to the ETSI membership; open participation in the technical work of ETSI; a generic prohibition of activities contrary to competition law; ex ante disclosure of essential IPRs and licensing terms; and adoption of ETSI standards on a voluntary basis.¹²⁰ Further, Section D of the Antitrust Guidelines titled *"Do's" and "Don'ts" for participants in ETSI Technical Committees and Working Groups*' recommends that members comply with competition laws, avoid discussions beyond standardisation issues, and refrain from anticompetitive activities.¹²¹

¹¹⁷ European Commission, Press Release: Antitrust clearance for licensing of patents for third generation mobile services, IP/02/1651, 12 November 2002.

After some initial restructuring for different technologies, the Commission was reassured that the 3GPPP licensing agreements between the industry participants involved in the standard making process of the 3G telecommunications network met the criteria of competition law provisions without restricting competition and innovation.

¹¹⁸ Supra note 114 in Section B.4.

¹¹⁹ Ibid.

This guidance essentially reflects the principles developed by CJEU in landmark cases, i.e. *Volvo*, *Magill*, *Bronner*, and *Microsoft*, dealing with refusal to license IPRs that are indispensable to industry participants to enter the market. Case 238/87 AB *Volvo v Erik Veng (UK) Ltd* [1998]; Cases C-241 and C-242/91P *RTE and ITP v Commission* [1995]. See also Case C-418/01 *IMS Health GmbH & Co v NDC Health GmbH & Co* [2004]; Case C-7/97 *Oscar Bronner GmbH & Co. v Mediaprint Zeitungs und Zeitschriftenverlag GmbH* [1998]; Case T-201/04 *Microsoft v Commission* [2007].

¹²⁰ ETSI, 'ETSI Guidelines for Antitrust Compliance', Section C.

¹²¹ Ibid Section D.

What is striking about the ETSI Antitrust Guidelines is the lack of guidance on patent holdup. ETSI has not taken any real precautions against holdup in contrast to CEN/CENELEC which, as previously noted, have adopted core principles of best practices to guide their members. Instead, ETSI provides general and broad-brush guidance on potential anticompetitive issues that may arise in standard making process without mention of patent holdup issues. Also, there are no policies that preclude opportunistic engagement against other members or third parties.

To conclude, neither the ETSI IPR Policy nor ETSI Guide on IPRs nor ETSI Guidelines for Antitrust Compliance confront the contentious issue, of a great magnitude, of patent holdup. It may be that ETSI implicitly relies on the FRAND licensing scheme to address potential opportunism in standard setting or it prefers to avoid any responsibility for mediating when disputes over licenses occur between its members. Nevertheless, as discussed, the ETSI Guide on IPRs alludes to patent ambush but not to patent holdup. This could be justified on the basis that the Commission initiated an investigation against ETSI to identify whether ETSI's policies were enabling SEP holders to engage in patent ambush. Equally, however, this should have been the case for patent holdup. Hence, as Chapter 5 of this study recommends, further inquiry by the Commission seems necessary here.

2.4 Competition Law Framework

As previously explained, the element of opportunism is central in the theory of patent holdup which is associated with the concept of the abuse of dominance. From a competition law perspective in Europe, unilateral opportunistic behaviour

by dominant undertakings, foreclosing competitors by charging supra-FRAND royalties while seeking injunctive relief, may amount to an abuse of a dominant position violating Article 102 TFEU.¹²² Beyond its Article 102 TFEU focus in specific cases, the Commission paid due attention to the standardisation agreements between competing undertakings in the ‘Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-Operation Agreements’ (the Horizontal Guidelines).¹²³ The Horizontal Guidelines, examined below, scrutinise the conditions under which participation in standard setting takes place, often involving actual or potential competitors in different markets. The Guidelines put a particular emphasis on SSOs IPR policies and FRAND terms as a means to effective access to standards, setting forth principles to safeguard standardisation.¹²⁴

2.4.1 Horizontal Guidelines and Standardisation Agreements

The Commission at Chapter 7 of its recently revised Horizontal Guidelines has provided a framework of analysis for standardisation agreements and terms, attempting to improve market efficiency and provide a safe harbour for standard setting. Standardisation agreements apply in four distinct markets: i. in the market for the product itself; ii. in the technology market where the standard involves the selection of technology; iii. in the service market for the setting of standards; and iv.

¹²² Article 102 of Treaty on the Functioning of the European Union [2012] OJ C326/47.

¹²³ European Commission, Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-Operation Agreements (the Horizontal Guidelines) [2011] OJ C11/01.

¹²⁴ See Whish R and Bailey D, *Competition law* (Ninth edition, Oxford University Press 2018) 1, 619.

in the market for testing and certification.¹²⁵ The Guidelines highlight not only the positive economic effects of standardisation agreements¹²⁶ but also the risk of restrictive effects on competition “[...] through three main channels, namely reduction in price competition, foreclosure of innovative technologies and exclusion of, or discrimination against, certain companies by prevention of effective access to the standard.”¹²⁷ The Guidelines particularly focus on the IPR policies of SSOs scrutinising their activities and the risks that could affect standardisation.

Consistent with the CJEU’s holding in *EMC v Commission*,¹²⁸ the Commission identified four principles for standardisation agreements to not fall foul of Article 101(1) TFEU, namely i. unrestricted participation; ii. transparency; iii. no obligation of compliance to a standard; and iv. access on FRAND terms.¹²⁹ The Guidelines require SSOs to police these principles via clear and balanced IPR policies.¹³⁰ This aims to ensure ex ante that standardisation agreements by SSO members avoid potential restriction of competition and, thereby, benefit from the safe harbour established in the Horizontal Guidelines. Beyond the four principles, the system of

¹²⁵ Supra note 123 in the Horizontal Guidelines para 261.

¹²⁶ Ibid para 263.

¹²⁷ Ibid para 264.

¹²⁸ Case T- 432/05 *EMC Development v Commission* [2010] ECR II- 000, [2010] 5 CMLR 757, upheld on appeal to the Court of Justice Case C-367/10 P; Case COMP/F-2/38.401 *EMC/European Cement Producers* [2005].

The case was related to the development of a cement standard which had been adopted via European Portland cement producers, the European Cement Association (Cembureau) and the European Committee for Standardisation (CEN). EMC Development AB challenged the Commission’s decision which rejected the complaint for an alleged anticompetitive agreement that of cartel created between the Cembureau and CEN. The Commission and the General Court (on appeal) rejected the EMC’s claims and ruled that the Horizontal Guidelines were applicable and that the complainant failed to show that procedure for adoption was discriminatory; non-transparent and that compliance with the standard was mandatory.

¹²⁹ Ibid para 280.

¹³⁰ Ibid para 284.

‘good faith duty’ to disclose up-front essential IPRs is examined as a means to reduce information asymmetries and improve accessibility to standards.¹³¹

The Horizontal Guidelines note risk of patent holdup. Although they do not identify the empirical evidence to support it, the Commission concludes in the Horizontal Guidelines that irrevocable FRAND commitments could eliminate the risk of patent holdup. It notes that: “[...] FRAND commitments can prevent IPR holders from making the implementation of a standard difficult by refusing to license or by requesting unfair or unreasonable fees (in other words excessive fees) after the industry has been locked-in to the standard or by charging discriminatory royalty fees.”¹³² However, the Horizontal Guidelines draw a clear distinction between the ownership or the exercise of SEPs and the possession or exercise of market power, specifying that ownership of SEPs “does not equate to dominance”.¹³³ That reflects the well-established principle developed in EU case law that IPRs as such do not confer market power,¹³⁴ but excessive prices imposed by a dominant undertaking may fall under the scope of an alleged abuse of dominance, i.e. exploitative practices, when the criteria of Article 102 TFEU and the principles established in case law are met.¹³⁵ As will be examined further in the next section, excessive FRAND royalties may constitute an exploitative conduct when a SEP holder charges a price that there

¹³¹ Ibid para 268 and 286.

¹³² Ibid para 287.

¹³³ Ibid para 269.

¹³⁴ Ibid para 269; Case 27/76 *United Brands and United Brands Continental v Commission* [1978] ECR 207; Case 85/76 *Hoffmann-La Roche v Commission* [1979] ECR 461; *François Lucazeau v. SACEM* (CJEU 1989) (EU); C-177/16 *AKKA/LAA v. Konkurrences Padome* [2017].

¹³⁵ Case 27/76; Case T-111/96 *ITT Promedia NV v. Commission* [1998] ECR II-2937.

is “no reasonable relation to the economic value of the product supplied”¹³⁶ constituting a conduct that is “directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions.”¹³⁷

According to the Horizontal Guidelines, the parties to the licensing agreements are responsible to verify the compliance its terms and fees with FRAND obligations.¹³⁸ It is not the role of SSOs to verify compliance with Article 101 of its members.¹³⁹ In case of a dispute, the Horizontal Guidelines provide a non-exhaustive list of methods of calculating FRAND royalty rates, e.g. comparison between ex ante and ex post royalty rates; independent expert assessment; and decisions by civil or commercial courts.¹⁴⁰ Furthermore, the unilateral ex ante disclosure of the most restrictive licencing terms by SEP holders is permissible according to the Horizontal Guidelines.¹⁴¹ This allows not only the informed selection of the available technical options and inclusion of technologies to be made on a cost-factual basis but also could function as a measure against patent holdup reducing anticompetitive effects.¹⁴² However, with an inverse reading, the Horizontal Guidelines are also permissive as to the refusal to disclose such terms. Thus, they do not mandate deeper transparency regarding the licensing terms. Purportedly, the ex post disclosure of the licensing terms could become a factor for increased information asymmetries and could leave room for the participants to behave strategically.

¹³⁶ Case 27/76 para 250.

¹³⁷ TFEU 102 (a).

¹³⁸ Supra note 123 in Horizontal Guidelines para 288.

¹³⁹ Ibid.

¹⁴⁰ Ibid para from 289 to 291.

¹⁴¹ Ibid 299.

¹⁴² Ibid.

The principles established in the Horizontal Guidelines have set the minimum standards for effective access to standardisation. The guidance provided in the Horizontal Guidelines, however, has been insufficient to resolve the dissonance between FRAND and non-FRAND royalties. This vagueness has also contributed to the emergence of anticompetitive practices in the European market, as seen in *Motorola* and *Samsung* cases examined below as well as creating an intense global landscape among the big tech companies.

2.5 Antitrust Review: Abuse of Dominance and SEPs

This section starts with a brief overview of the emergence of patent holdup cases. The seminal US cases will be outlined up to *Rambus* in order to illustrate the timeline and spread of patent holdup cases from the US to the European instance. Then the remaining sections focus on the seminal EU competition cases here and particularly the CJEU's ruling in *Huawei*.

Patent holdup in standard setting has been the subject matter of antitrust scrutiny for nearly 30 years now. It is no coincidence that antitrust cases emerged with the ICT explosion. The first SDOs that included patents into their standardisation processes appeared in the US. Since its establishment, the American National Standards Institute (ANSI) has been facilitating the process of standardisation by accrediting and overseeing SDOs.¹⁴³ It was the first body that introduced and promulgated a policy framework that required the licensing of standardised technologies

¹⁴³ ANSI is not an SSO, however, it “[...] facilitates the development of American National Standards (ANS) by accrediting the procedures of standards developing organizations (SDOs). These groups

on reasonable terms to any interested and qualified party.¹⁴⁴ Subsequently, the concept of FRAND was transposed to the policies of the European Standardisation Organisations (ESOs).¹⁴⁵ Therefore, unsurprisingly, the first cases of antitrust liability based on patent holdup were in the US.

The patent holdup phenomena in standard setting first appeared in the mid 1990s in the form of ‘patent ambush’. The first antitrust enforcement action culminated in the *Dell v FTC* case.¹⁴⁶ Dell concealed its essential patents during the standard-making process and, following the incorporation of its SEPs into the VL-bus standard and the extensive adoption of the standard by the computer manufacturers, asserted infringement claims against a number of them.¹⁴⁷ The US Federal Trade Commission (FTC) asserted liability under s. 5 of the FTC Act, alleging that the deceptive practice of Dell against the SSO, the Video Electronics Standards Association

work cooperatively to develop voluntary national consensus standards. Accreditation by ANSI signifies that the procedures used by the standards body in connection with the development of American National Standards meet the Institute’s essential requirements for openness, balance, consensus and due process.” See ANSI, ‘Introduction to ANSI’ available at https://www.ansi.org/about_ansi/introduction/introduction?menuid=1 accessed on 1 September 2019.

¹⁴⁴ For a detailed analysis see Contreras JL, ‘A Brief History of FRAND: Analyzing Current Debates in Standard Setting and Antitrust through a Historical Lens’ (2015) 80 *Antitrust Law Journal* 39, 43; Willingmyre G, ‘History of the Patent Policy of the American National Standards Institute’ available at <https://papers.ssrn.com/abstract=2451165> accessed on 1 September 2019.

The 1959 policy provisions required that: “Standards should not include items whose production is covered by patents unless the patent holder agrees to and does make available to any interested and qualified party a license on reasonable terms or unless other unpatented competing items are included within the standards and the patented item would suffer were it left out.” See American Standards Association, ‘Procedures of American Standards Association’ (1959).

¹⁴⁵ Torti V, *Intellectual Property Rights and Competition in Standard Setting: Objectives and Tensions* (Routledge 2016) 1, 91.

¹⁴⁶ *Dell Computer*, 121 Federal Trade Commission 616 (1996).

¹⁴⁷ This standard is described as: “a mechanism to transfer instructions between the central processing unit and its peripherals, such as a hard disc drive or video display hardware.” See *ibid.*

(VESA) comprised unfair methods of competition that harmed commerce. The consent order required Dell not to assert its patents under the standard against computer manufacturers.

Subsequently, the FTC dealt with the seminal case of deceptive conduct in *Rambus*.¹⁴⁸ The Joint Electron Device Engineering Council (JEDEC), a US SSO, developed a standard for DRAM chips with a worldwide adoption rate (accounted 95% of the market).¹⁴⁹ Rambus, proprietor of DRAM and successive standardised technologies, had asserted its SEPs against manufacturers. However, Rambus had intentionally concealed its patents, ignoring the JEDEC IPR disclosure requirement, and had engaged in patent ambush seeking to extract excessive royalty rates. The FTC claimed that Rambus engaged in unlawful monopolisation of the market and thereby filed an administrative complaint against Rambus.¹⁵⁰ In this lengthy litigation, the Commission's complaint was initially dismissed in its entirety by the administrative law judge. This was subsequently appealed and led the FTC to re-examine the evidence.¹⁵¹ However, the Commission in its final order condemned Rambus practices and ordered Rambus to provide reasonable licences nevertheless the inconclusive nature of the evidence.¹⁵² Following Rambus appeal, the D.C. Circuit

¹⁴⁸ *Rambus*, Case n°9302, Federal Trade Commission (2006); *Rambus v Federal Trade Commission*, 522 F.3d 456 (C. App. D.C. Circuit, 2008); *F.T.C. v Rambus*, Order of the US Supreme Court (2009).

¹⁴⁹ Organisation for Economic Co-operation and Development (OECD), 'Licensing of IP Rights and Competition Law -Background Note by the Secretariat' (2019) DAF/COMP(2019)3 1, 27.

¹⁵⁰ *Rambus, Inc. v. FTC*, 522 F.3d 456,460 (D.C. Cir 2008).

¹⁵¹ FTC, 'In the Matter of Rambus, Inc.', FTC Docket No. 9032 (July 31, 2006), Section IV. B.

¹⁵² Liability Opinion, In re Rambus, Inc., FTC No 9302.

Court of Appeals overturned the FTC's decision while the Supreme Court denied certiorari, leaving intact the reversal of the FTC.¹⁵³

Patent holdup re-emerged in 2005 with the aggressive enforcement of SEPs and non-SEPs by patent assertion entities (PAEs), pejoratively known as patent trolls, in the US. In light of patent holdup, the US Supreme Court in *eBay*,¹⁵⁴ found that the Federal Circuit Court of Appeals' automatic default to a preliminary injunction in patent infringement cases was not justified. Rather, the Court identified the factors under which a patent holder could obtain either interlocutory or permanent injunctive relief, noting that these were the four traditional considerations for evaluating whether such equitable relief was appropriate. These comprised that:

- i. [the plaintiff] has suffered an irreparable injury;
- ii. remedies available at law, such as monetary damages, are inadequate to compensate for that injury;
- iii. considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and
- iv. the public interest would not be disserved by a permanent injunction.¹⁵⁵

Where the plaintiff failed to establish these, the Court held, monetary damages would be a sufficient remedy for the harm caused by the alleged patent infringement.

¹⁵³ *Rambus Inc. v. FTC*, cert. denied, 129 S. Ct. 1318 (2009); for a detailed analysis of the Rambus case see Wallace JM, 'Rambus v. F. T.C. in the Context of Standard-Setting Organizations, Antitrust, and the Patent Hold-up Problem' (2009) 24 Berkeley Technology Law Journal 661; Torti V, *Intellectual Property Rights and Competition in Standard Setting: Objectives and Tensions* (Routledge 2016) 136-147.

¹⁵⁴ *eBay Inc. v. MercExchange* [2006] 547 U.S.

¹⁵⁵ *Ibid* 388.

Based on the principles of equity,¹⁵⁶ the *eBay* established a higher threshold for patent holders to seek injunctive relief against alleged infringers than that applied by the Federal Circuit Court of Appeals, the federal appellate court with exclusive patent law jurisdiction. Thus, the test functioned as a deterrent against the unjustified use of injunctions as a threat mechanism by SEP holders,¹⁵⁷ and the Federal Circuit Court has applied it ever since in SEP enforcement cases.¹⁵⁸

It was not long before patent holdup issues spread to the European region as the smartphone wars went global. The interplay between patents and standards, the fragmentation of the patent enforcement system (in different national courts applying different standards), and the possible dubious legitimacy of injunctions in combination with the uncertain method of calculating FRAND royalty rates have amplified antitrust concerns in Europe. While the Horizontal Guidelines were a first attempt to provide some clarity, appearing to offer a safe harbour, with their lack of boundaries for FRAND and the seeming blessing of recourse to courts to resolve matters, they were inadequate to restrain patent holdup. As a result, the Commission as the primary enforcer¹⁵⁹ launched antitrust investigations and proceedings in what have proved to be three seminal cases addressing holdup, against Rambus, Samsung, and Motorola.

¹⁵⁶ 35 U.S. Code Part III - Patents and Protection of Patent Rights §283: "The several courts having jurisdiction of cases under this title may grant injunctions in accordance with the principles of equity to prevent the violation of any right secured by patent, on such terms as the court deems reasonable."

¹⁵⁷ Based on a recent study, no injunctions have been granted for SEPs after the *eBay* ruling. See Gupta K and Snyder M, 'Smart Phone Litigation and Standard Essential Patents' (2014) Hoover IP² Working Paper Series 1.

¹⁵⁸ *Apple Inc v Motorola Inc* [2014] Federal Circuit 757 F.3d 1286, 1331.

¹⁵⁹ European Council, Regulation 1/2003 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty [2002] OJ L1/9, 16 December 2002.

2.5.1 The *Rambus* Case

In 2007, the first case of patent ambush appeared in Europe with the *Rambus* case.¹⁶⁰ Following the earlier, ultimately unsuccessful action of the US FTC against Rambus, the European Commission initiated an investigation and sent to Rambus a Statement of Objections.¹⁶¹ In its Statement of Objections, the Commission set out its preliminary conclusions that Rambus, by holding a dominant position in the market for DRAM interface technologies and charging unreasonable fees for SEPs based on deceptive practices, had abused its dominant position breaching Article 102 TFEU.¹⁶²

The Commission considered the element of bad faith present when a SSO member is aware that it holds IPRs that read on a standard and essential to its use only discloses them after the standard's adoption.¹⁶³ Referring to the Horizontal Guidelines, the Commission pointed out that standard setting procedures should be non-discriminatory, open, and transparent.¹⁶⁴ Further, the Commission in its provisional conclusions expressed that JEDEC patent policy at least expected its members to disclose any patents involved in standard setting in order to prevent the "manipulation of the standard-setting process" and "ensuring that licences for technologies protected by patent rights included in the standard are offered to JEDEC members

¹⁶⁰ *Rambus* (COMP/38.636) Commission Decision 2010/C 30/09 [2010] OJ C 30/17.

¹⁶¹ European Commission, Press Release 'Antitrust: Commission confirms sending a Statement of Objections to Rambus' (MEMO/07/330) of 23rd August 2007.

¹⁶² *Ibid.*

¹⁶³ European Commission, Communication on Intellectual Property Rights and Standardisation, COM (1992) 445, paragraph 4.2.10.

¹⁶⁴ European Commission, Notice on 'Guidelines on the applicability of Article 81 of the EC Treaty to horizontal cooperation agreements (Text with EEA relevance)' [2001] OJ C 3 at para 163 and 171.

on reasonable terms.”¹⁶⁵ Although Rambus was aware of the disclosure requirement and work of JEDEC,¹⁶⁶ it intentionally concealed the patents from JEDEC to allow the industry to be locked into the JEDEC standard first, and then claim royalties from the manufacturers.¹⁶⁷ This aspect was also raised in the administrative proceedings of the FTC, where it found that Rambus even after the termination of its membership from JEDEC carried on with the deceptive conduct to conceal its patent applications.¹⁶⁸ The Commission, therefore, preliminarily found that Rambus planned to capture and gain control over the JEDEC standard.¹⁶⁹

In light of the above, Rambus’ alleged infringement of Article 102 TFEU was based on the exploitative and exclusionary conduct taking into account the underlying duty of good faith of the JEDEC Policy.¹⁷⁰ In other words, it abused its dominant position not because it breached the IPR policies *per se* but because it charged exorbitant fees by jeopardising the standard setting process while concealing its IPRs from JEDEC. When Rambus, however, agreed to undertake commitments to offer capped royalty rates for DRAM-compliant products, the Commission closed the Article 102 proceedings.

¹⁶⁵ *Supra* note 160 *Rambus* at 38.

¹⁶⁶ JEDEC Policy is to opt for open standards accessible to the industry while standards that involve IPRs are only accepted when they are fully disclosed. See *ibid* at 35.

¹⁶⁷ *Ibid* at 40-47.

¹⁶⁸ During the scrutiny the FTC found that: “[...] although no longer a JEDEC member, Rambus continued to conceal its relevant patent applications. Rambus CEO Tate, for example, stated in a February 1997 e-mail to Rambus executives, “do *NOT* tell customers/partners that we feel DDR may infringe – our leverage is better to wait [...] in its October 1998 “strategy update,” Rambus stated, “We should not assert patents against Direct partners until ramp reaches a point of no return.” In sum, after leaving JEDEC, Rambus strategically maintained its silence, thereby prolonging the misimpression created by its prior conduct. See Opinion of the Commission, ‘In the Matter of Rambus’, Inc., Docket No. 9302, 1-47 available at <https://www.ftc.gov/sites/default/files/documents/cases/2006/08/060802commissionopinion.pdf> accessed on 1 September 2019.

¹⁶⁹ *Supra* note 160 *Rambus* at 40-47.

¹⁷⁰ *Ibid*.

Rambus shows that the requirement of disclosure of essential IPRs to the development of a standard is a crucial parameter for the undisturbed functionality of the standardisation process and the minimisation of anticompetitive behaviour. Equivocal language of the JEDEC IPRs Policy was one of the key factors that enabled Rambus to engage opportunistically,¹⁷¹ and, although not stated, a factor that led the US Courts to overturn the FTC's enforcement order.¹⁷² The EU Commission interpreted the JEDEC Policy in conjunction with the opportunistic behaviour of the undertaking to evaluate breach of competition law provisions.¹⁷³ The preliminary finding of the Commission that Rambus manipulated and captured standard setting is of a significant importance. This illustrates that it is crucial for the language and restrictions of SSOs' IPR Policies to be clear and concise as to the disclosure and licensing of SEPs. Otherwise, policy gaps could induce opportunism and subverting standard setting principles of openness, accessibility, and transparency leading to capture.

After *Rambus*, the Commission initiated an investigation for an alleged infringement of Article 102, also involving FRAND royalties of SEPs against Qualcomm. This followed complaints by six mobile phone and chipset manufacturers alleging that Qualcomm was charging non-FRAND fees for SEPs embedded into

¹⁷¹ Torti V, *Intellectual Property Rights and Competition in Standard Setting: Objectives and Tensions* (Routledge 2016) 1, 177.

¹⁷² *Ibid.*

¹⁷³ Specifically, the Commission noted that: "[...] while the Commission considered that Rambus may have breached JEDEC's patent policy in its preliminary assessment, an actual breach of the precise rules of a standard-setting body would not be a necessary requirement for a finding of abuse in this context. The finding of abuse would rather be conditioned by the conduct that has necessarily influenced the standard process, in a context where suppression of the relevant information necessarily distorted the decision making process within a standard-setting body." *Supra* note 160 *Rambus* at 39.

WCDMA (part of the 3G network technology), and, thus, breaching EU competition law provisions.¹⁷⁴ The Commission in its 2009 Press Release stated that: “[t]he investigation will focus on whether Qualcomm is dominant and whether the licensing terms and royalties imposed by Qualcomm are, as alleged by the complainants, not fair, reasonable and non-discriminatory.”¹⁷⁵ Again, the focal point of the investigation in this case was the exploitative conduct, i.e. breach of FRAND commitments, coupled with the abuse of dominance. However, Qualcomm settled the disputes via mutual agreements with all the complainant; hence, the Commission closed the formal antitrust proceedings against Qualcomm after the withdrawal of the complaints.¹⁷⁶ It was for the next two cases, namely *Samsung* and *Motorola*, to outline Article 102 infringement criteria in patent holdup cases but not involving patent ambush as in *Rambus*.

¹⁷⁴ European Commission, Press Release ‘Antitrust: Commission initiates formal proceedings against Qualcomm’ MEMO/07/389 of 1 October 2007. The six companies were Ericsson, Nokia, Texas Instruments, Broadcom, NEC and Panasonic.

¹⁷⁵ Ibid.

¹⁷⁶ European Commission, Press Release ‘Antitrust: Commission closes formal proceedings against Qualcomm’ MEMO/09/516 of 24 November 2009.

2.5.2 The *Samsung* and *Motorola* Cases

In 2012, the Commission opened two formal investigations against Samsung and Motorola to assess whether both undertakings had abused their dominant position by enforcing their SEPs against Apple. Samsung and Motorola, both members of ETSI, had committed to offer FRAND licences to the users of their SEPs. However, the Commission launched its proceedings following Apple's complaints that licence offers were not FRAND-compliant, and, thus, enforced EU competition law delivering a commitments decision in *Samsung* and an infringement decision in *Motorola* based on Articles 9 and 7, respectively, of Regulation 1/2003.¹⁷⁷

In *Samsung*,¹⁷⁸ the Commission investigated whether Samsung had failed to honour FRAND commitments in licensing negotiations with Apple. It also considered whether the former had abused its dominant position by seeking injunction for its FRAND-encumbered SEPs incorporated into the widely adopted and EU-mandated, harmonised UMTS standard that any handset manufacturer would need to comply with to enter the market for the generation of EU mobile telecommunications.¹⁷⁹ Samsung was found to have a dominant position in the relevant market holding a 100% market share of the given standard in the European Economic Area

¹⁷⁷ European Council, Regulation 1/2003 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty [2002] OJ L1/9, 16 December 2002.

¹⁷⁸ *Samsung* - Enforcement of UMTS Standard Essential Patents (Case AT.39939) Commission Decision 2014/C 350/08 [2014] OJ C 350/80.

¹⁷⁹ European Commission, Press Release 'Antitrust: Commission opens proceedings against Samsung' IP/12/89 of January 2012; European Parliament and of the Council, 'On the coordinated introduction of a third-generation mobile and wireless communications system (UMTS) in the Community', Decision No 128/1999/EC of the 14 December 1998.

(EEA).¹⁸⁰ The Commission's preliminary view, expressed in the Statement of Objections, was that Samsung's behaviour may have breached Article 102. The Commission examined three factors to draw provisional conclusions.

First, it applied the doctrine of exceptional circumstances,¹⁸¹ finding that the industry was locked-into the UMTS standard and that Samsung had committed to grant FRAND licences for its IPRs reading on this standard. Second, it examined whether there was an objective justification for Samsung's conduct.¹⁸² However, it pointed out that the holding of IPR is not sufficient to justify seeking injunctive relief especially where, as here, Apple was willing to enter into a license agreement on FRAND terms.¹⁸³ Lastly, the Commission evaluated whether Samsung's behaviour could distort competition. It provisionally found that Samsung could foreclose competition by: "(i) excluding Apple, a rival manufacturer of UMTS-compliant mobile devices from the market; and (ii) inducing Apple to accept disadvantageous licensing terms, compared to those which Apple may have accepted in the absence of injunctions being sought."¹⁸⁴ Regarding the latter, the Commission pointed out the importance of the "public interest in an effective standardisation process" noting

¹⁸⁰ Supra note 178 *Samsung* at para 45.

¹⁸¹ It has been well established via EU law jurisprudence that unilateral refusal to license IPRs could violate A 102 TFEU only in exceptional circumstances. Such exceptional circumstances could be met when these conditions are present cumulatively: the license is indispensable to the competing product; the grant of the license would introduce a new product; failure to grant a license excludes any competition; there is no objective justification.

See, Case 238/87 *Volvo v Veng* [1988] ECR 6211, paragraph 9; Joined Cases C -241/91 P and C-242/91 P *RTE and ITP v Commission* ("Magill") [1995] ECR I-743, paragraph 50; Case C-7/97 *Bronner* [1998] ECR I-7791, paragraph 39; Case C-418/01 *IMS Health* [2004] ECR I-5039, paragraph 35; Case T 201/04 *Microsoft v Commission* [2007] ECR II-3601, paragraph 331.

¹⁸² Supra note 178 *Samsung* at para 49.

¹⁸³ *Ibid* 65-70

¹⁸⁴ *Ibid* at 62-64.

that injunctive relief against a willing licensee would be against the proper functioning of standard setting and unrestricted access to standards.¹⁸⁵

Samsung, in response to the Commission's investigation, offered commitments to not seek injunctive relief in the European region for the UMTS SEPs and to comply with a 'Licensing Framework' for the determination of FRAND royalties. The Commission accepted Samsung's commitments under Article 9 of Regulation 1/2003 to "ensure effective access to a standard for all market players and to prevent "hold-up by a single SEP holder" providing a 'safe harbour' for willing licensees in line with the competition law.¹⁸⁶

In *Motorola*,¹⁸⁷ the Commission found that the undertaking had violated Article 102 by seeking and enforcing its FRAND-encumbered SEP for the Cudak GSM/GPRS standard, part of the ETSI GPRS standard, against Apple in Germany before the Düsseldorf and Mannheim Courts. Apple using the competition law defence (also known as 'the Orange Book defence'),¹⁸⁸ had submitted six successive offers compliant with German law requirements for that defence¹⁸⁹ for the infringed Motorola SEP in the German court proceedings. In its decision, the Commission

¹⁸⁵ Ibid 69.

¹⁸⁶ European Commission, Press Release 'Antitrust: Commission accepts legally binding commitments by Samsung Electronics on standard essential patent injunctions' IP/14/490 of 29 April 2014.

¹⁸⁷ *Motorola* - Enforcement of GPRS Standard Essential Patents (Case AT.39985) Commission Decision 2014/C 344/06 [2014] OJ C 344/6.

¹⁸⁸ The competition law defence was established in the Orange Book case where the German Federal Supreme Court ruled that a defendant can rely on such a defence if they unconditionally offer to enter into a licence agreement with the SEP (or other patent) holder and behave as an actual licensee. Thus, the application of a competition law defence could block the issuance of an injunction relief. *Orange-Book-Standard*, Federal Court of Justice (Bundesgerichtshof), decision of 6 May 2009, Case No. KZR 39/06, GRUR 2009.

¹⁸⁹ See further 2.5.3.

highlighted that Apple, as evident from its second offer, had been willing to enter into a FRAND licence agreement.¹⁹⁰

The Commission followed the formal criteria to establish abuse of a dominant position by examining the dominance of Motorola in the market, the exceptional circumstances of the case, the existence of objective justifications, and the anticompetitive effects of the conduct. It concluded that Motorola was dominant in the market for holding and licensing the Cudak GPRS SEP due to the indispensability of the GPRS standard and the lock-in effects created in the market.¹⁹¹ The commitments given by Motorola to ETSI to license the Cudak GPRS SEP on FRAND terms, and the GPRS standard setting context constituted the exceptional circumstances of the case.¹⁹² Motorola presented five justifications to objectively justify its actions under Article 102:

- i. the protection of its commercial interests;
- ii. that it had acted in line with the applicable German case-law;
- iii. the ETSI IPR Policy does not prescribe a waiver of the right to seek injunctions;
- iv. the termination clause was in line with the 2004 TTBER;
- v. the Settlement Agreement gave rise to advantages in terms of efficiencies that benefit consumers.¹⁹³

¹⁹⁰ *Supra* note 187 *Motorola* at paras 125-127 and 279-280. The Commission noted that: “[t]he Second Orange Book Offer gave Motorola the right to set the royalties according to its equitable discretion and according to FRAND principles, without any limitations (other than FRAND and Article 102 TFEU) as regards the royalty rates and the method of calculation of the final amount of royalties. The offer also allowed for a full judicial review of the amount of FRAND royalties, whereby Motorola and Apple could submit their own evaluations, calculations and reasoning for consideration to the court.”

¹⁹¹ *Ibid* paras 226.

¹⁹² *Ibid* paras 281-300.

¹⁹³ *Ibid* paras 424-425.

The Commission, following precedent, in *Motorola* underscored that the mere ownership of IPRs does not constitute an objective justification to seek and enforce injunctions. Further, it rejected the Motorola’s justifications on the basis that “at least as of that Second Orange Book Offer, there was no need for Motorola to have recourse to an injunction in order to be appropriately remunerated for the use of its SEPs”.¹⁹⁴

Focusing on Motorola’s third justification, the Commission, citing the *AstraZeneca* case, drew a clear distinction between compliance with competition rules and compliance with other legal rules, i.e. ETSI IPR Policies – contract law.¹⁹⁵ It is apparent from the decision that the abusive conduct is examined as such, irrespective of what other legal rules permit or require. Applying this to the ETSI context, it means that even if ETSI IPR Policy required its members to waive their right to seek injunctive relief, failure to do would be examined solely on competition law grounds as anticompetitive conduct and not, e.g. under contract law, regardless of any potential status of the ETSI IPR Policy as such.

As to the anticompetitive effects of Motorola’s conduct, the Commission found the following to be detrimental to competition: “a temporary ban on the online sale of Apple’s GPRS-compatible products in Germany; the inclusion in the Settlement agreement of licensing terms, disadvantageous to Apple; and a negative impact on standard-setting.”¹⁹⁶ The Commission highlighted that in general the use

¹⁹⁴ Ibid paras 492-496.

¹⁹⁵ Ibid 473-474; Case C-457/10 P *AstraZeneca v Commission* [2012] para 132.

¹⁹⁶ Supra note 187 *Motorola* para 311. The Commission pointed out the risk of patent holdup and its adverse effects, noting that: “[t]his Decision promotes the proper functioning of standard-setting by

or pursuit of injunctive relief is a legitimate course of action, however, the restriction was limited to the facts of this case.¹⁹⁷ In addition, the decision points out that damages were an appropriate means of remuneration and Motorola's recourse to an injunction was unnecessary.¹⁹⁸ In light of the above, the Commission ordered Motorola to eliminate the anticompetitive effects resulting from its conduct without imposing a fine. The absence of precedent regarding seeking an injunction against a willing licensee and the diverging conclusions of national courts on the issue justified the Commission's not imposing a fine.¹⁹⁹

The Commission in *Motorola* and *Samsung*, attempting to minimise the instance of patent holdup, introduced the concept of the 'willing licensee' into EU competition law as a safe harbour for SEP users who are willing to enter into a FRAND agreement with SEP holders who seek injunctive relief against the alleged infringers. These antitrust proceedings in *Samsung* and *Motorola* directly affected court proceedings in Germany creating a conflict between the Commission's 'willing licensee' and the legal standard/competition law defence, i.e. Orange-Book standard, as applied by the German courts and requiring, in part, a reasonable offer and escrow payment as if an 'actual' licensee. As a result, the Landgericht Düsseldorf (District Court of Dusseldorf) stayed its proceedings in the *LTE-Standard* case and referred the matter to the CJEU which considered the preliminary reference in the landmark

ensuring the accessibility of the technology included in the GPRS standard and by preventing hold-up. It strikes a fair balance between, on the one hand, the interests of Motorola to obtain appropriate remuneration for its Cudak GPRS SEP and, on the other hand, the interests of implementers of the GPRS standard to be able to manufacture and sell lawfully standard-compliant products."

¹⁹⁷ Ibid 492.

¹⁹⁸ Ibid 495. Similar to the US approach in *eBay*, the Commission here noted the non-essential use of injunctions when damages suffice.

¹⁹⁹ Ibid 561.

case of *Huawei v ZTE*.²⁰⁰ As examined in the next section, the legitimacy of SEP enforcement has now received judicial review in which the CJEU adopted a divergent approach to both that of Germany and the Commission's, adopting a market-oriented test based on a bilateral negotiations framework.²⁰¹

2.5.3 The *Huawei* Case

In 2014, Huawei, the holder of a patent it had declared to be essential to the ETSI LTE standard and for which it had committed to FRAND licensing, sought injunctive relief against ZTE, another Chinese manufacturer, after failure to reach agreement on the licence rate. As noted, the Landgericht Düsseldorf referred the case to the CJEU, seeking guidance as to which approach it should follow to evaluate abuse of dominance in the context of SEP enforcement, that of the 'Orange Book Standard' or the Commission's approach in *Motorola*.²⁰²

In the *Orange Book* case,²⁰³ the Bundesgerichtshof (German Federal Supreme Court) established a competition law defence to a claim of patent infringement where the petition for the granting of an injunction could amount to an abuse of a dominant position in certain circumstances. The *Orange Book* concerned an industry *de facto* standard (as opposed to the *de jure* standard in *Huawei*) that was not developed by an SSO and the SEPs involved were not on a FRAND basis. However,

²⁰⁰ Landgericht Düsseldorf, Reference of questions on the interpretation of Article 102 Treaty on the Functioning of the European Union to the Court of Justice of the European Union (LTE-Standard), File number 4b O 104/12, 21 March 2013.

²⁰¹ C-170/13 *Huawei Technologies Co. Ltd v ZTE Corp., ZTE Deutschland GmbH* [2015] ECLI:EU:C:2015:477.

²⁰² Specifically, the District Court referred five questions to the CJEU. See *ibid* 39.

²⁰³ *Orange-Book-Standard*, Federal Court of Justice (Bundesgerichtshof), decision of 6 May 2009, Case No. KZR 39/06, GRUR 2009, 694.

the German courts have extended the defence's application to SEP disputes involving SSO standards.²⁰⁴ The divergence between the *Orange Book* standard and the Commission's willing licensee concept created a conflict. To resolve this, the CJEU judgment was primarily based on the factual difference between the *Orange Book* standard and the case here highlighting differences between de facto standards and standards built via collective standardisation process of an SSO.²⁰⁵ Further, the Court found that the Commission's approach could amount to the limitation of the right of a SEP holder to seek injunctive relief.²⁰⁶ Therefore, it endorsed the preceding opinion of the Advocate General and built on a balanced approach seemingly deviating from that of the Commission and rendering the *Orange Book Standard* inapplicable in SEP cases.²⁰⁷

In order for the CJEU to strike the right balance between free competition and IPRs, it first outlined key principles from prior cases. Specifically, it stated that the abuse of dominance is an objective test, and the exercise of IPRs constitutes an abuse of dominance only in "exceptional circumstances".²⁰⁸ The CJEU, however, distinguished the instant case from precedent, holding that SEPs could not be treated

²⁰⁴ The steps for the *Orange Book* defence are: "First, the defendant must have made the applicant an unconditional offer to conclude a licensing agreement not limited exclusively to cases of infringement, it being understood that the defendant must consider itself bound by that offer and that the applicant is obliged to accept it where its refusal would unfairly impede the defendant or infringe the principle of non-discrimination. Secondly, where the defendant uses the teachings of the patent before the applicant accepts such an offer, it must comply with the obligations that will be incumbent on it, for use of the patent, under the future licensing agreement, namely to account for acts of use and to pay the sums resulting therefrom." See supra note 201 in *Huawei* at paras 31 and 32.

²⁰⁵ Supra note 201 in *Huawei* at 48-49.

²⁰⁶ Ibid 50.

²⁰⁷ Ibid 59 onwards. See 2.5.4 for a further discussion on the subsequent confusion and shortcomings of the decision.

²⁰⁸ Ibid 45 - 47.

as regular patents.²⁰⁹ In particular, the CJEU pointed to two distinctive features of SEPs. The first was the indispensability of SEPs to the manufacture of a standard-compliant product.²¹⁰ The second, was the irrevocable commitment that a SEP holder gives to a standardisation body to grant FRAND licences that creates legitimate expectations that SEP users will access standards on FRAND terms.²¹¹ Therefore, the CJEU reasoned, refusal to license SEPs on FRAND terms could constitute abuse of dominance.²¹²

According to the judgment, the CJEU sought to strike a balance in relation to all legitimate interests of the parties by maintaining free competition and equivalent bargaining power for both, SEP holders²¹³ and users.²¹⁴ It established the following six-step test for legitimate pursuit of injunctive relief based to occur in the FRAND licencing negotiations:

1. The patent holder must notify the alleged infringer about the patent infringement;²¹⁵

²⁰⁹ Ibid 48-49 citing *RTE and ITP v Commission* (EU:C:1995:98, paragraphs 50, and 53 to 56) (refusal to grant a copyright licence) and *IMS Health* (EU:C:2004:257, paragraphs 35 and 36) (refusal to grant a licence for the use of a brick structure protected by an intellectual property right); *Bronner* (C-7/97, EU:C:1998:569, paragraphs 39 and 40) (refusal of a media undertaking to include a rival daily newspaper in its newspaper home-delivery scheme).

²¹⁰ Ibid; Tsilikas highlights that the indispensability feature: “is again used to bypass the IMS new-product requirement: in Huawei, the competition law limitation concerns the very subject matter of the patent, not a new product resulting from follow-on innovation in a secondary market.” Tsilikas H, ‘Huawei v. ZTE in Context – EU Competition Policy and Collaborative Standardization in Wireless Telecommunications’ (2017) 48 IIC - International Review of Intellectual Property and Competition Law 151, 171.

²¹¹ Supra note 201 in *Huawei* at para 51.

²¹² Ibid 53.

²¹³ In terms of the SEP holder’s right to assert IPRs the Court took into consideration Directive 2004/48 which is in line with Article 17(2) of the Charter, i.e. right to enforce IPRs, and Article 47 of the Charter, i.e. right to an effective remedy and to a fair trial. *ibid* 57-58.

²¹⁴ Supra note 201 at paras 57-60.

²¹⁵ Ibid 61.

2. The infringer should express its willingness to conclude a licence agreement on FRAND terms;²¹⁶
3. The patent holder must provide a specific written license offer on FRAND terms specifying the royalty rate and the calculation method;²¹⁷
4. The infringer must respond in good faith and without any delaying tactics;²¹⁸
5. If the infringer does not accept the offer, they must make a written counter-offer in reasonable time on FRAND conditions;²¹⁹ and
6. If the patent holder does not accept the counter-offer, the infringer must render account and provide security for the payment of royalties.²²⁰

The above steps are to be met cumulatively and sequentially before a SEP holder seeks justifiably an injunction against an alleged infringer/SEP user. Lastly, it is clear from the judgment that the CJEU validated the Commission's approach as to the inapplicability of the *Orange Book Standard* in the SEP enforcement of collaborative standardisation processes. However, the Court introduced a new test that aimed to provide a more balanced approach between the bargaining power of the parties as opposed to the willing licensee test established in the *Motorola* and *Samsung* which was found to shift the bargaining power in favour of the SEP licensees.

²¹⁶ Ibid 63.

²¹⁷ Ibid 64.

²¹⁸ Ibid 65.

²¹⁹ Ibid 66.

²²⁰ Ibid 68.

2.5.4 Analysis of the *Huawei* test

The *Huawei* test intended to reduce the risk of the abusive conduct by striking a balance between the SEP holders' right to enforce their IPRs and SEP users' right to access standards.²²¹ Although it serves to an extent as a "safe harbour", having established a preliminary phase before a SEP holder seeks injunctive relief, there are certain key gaps and shortcomings. The ruling is based more on the contract and civil law concepts as well as fundamental rights, such as good faith, recognised commercial practices and Charter's rights, respectively, and less on competition law theory.²²² For some scholars the CJEU's decision has been criticised as unclear, and formalistic in that it does not edify the perplexing anticompetitive issues in standard setting.²²³

The academic literature on the *Huawei* test has revealed the emergence of several contrasting themes. The decision is ambiguous in terms of the interaction between IP protection and antitrust liability.²²⁴ Geradin asserts that the main weakness of the test is that in the case where the SEP holder and user fail to agree on royalty rates there is no obligation to seek a legal remedy, such as an arbitral tribunal or a court or an independent court, but instead provides that an independent third-

²²¹ Supra note 210 Tsilikas H.

²²² Rato M and English M, 'An Assessment of Injunctions, Patents, and Standards Following the Court of Justice's Huawei/ZTE Ruling' (2015) 7 Journal of European Competition Law & Practice 103.

As Picht emphasised "[...] Huawei/ZTE is rooted much less in genuine competition law than some might have expected—or hoped." Picht PG, 'The ECJ Rules on Standard essential Patents: Thoughts and Issues Post-Huawei' (2016) 37 ECLR 365, 370.

²²³ Ibid Rato M and English M; Colangelo PG and others, 'Filling Huawei's Gaps: The Recent German Case Law on Standard Essential Patents' (2017) 38 European Competition Law Review 538.

²²⁴ Supra note 222 Picht.

party could determine the amount of the royalties.²²⁵ Additionally, the decision does not set out clearly the conditions when enforcement of SEPs could violate Article 102. Rather, it established a preliminary framework of procedural steps with open-ended terms between parties leaving to the national courts to identify whether the parties have met the criteria of the test.²²⁶ These ambiguities can trigger divergence in the judicial analysis of interpreting the *Huawei* test among national courts deepening the fragmentation of case law and perplexing the assessment of anticompetitive liability of SEP holders in the patent holdup cases.²²⁷

The practical issues that have arisen during court proceedings since *Huawei* can be summarised as follows to include: i. sufficiency of details of the pre-litigation notice of infringement; ii. FRAND-compliance of the initial offer; and iii. eligibility to offer portfolio and worldwide licences. These discrepancies are evident from the current judicial developments post-*Huawei*.

²²⁵ Geradin D, 'European Union Competition Law, Intellectual Property Law and Standardization' in Contreras JL (ed), *The Cambridge Handbook of Technical Standardization Law: Competition, Antitrust, and Patents* (Cambridge University Press 2017).

²²⁶ Batista PHD and Mazutti GC, 'Comment on "Huawei Technologies" (C-170/13): Standard Essential Patents and Competition Law – How Far Does the CJEU Decision Go?' (2016) 47 IIC - International Review of Intellectual Property and Competition Law 244, 249; Wilson D and others, 'CJEU permits standard essential patent (SEP) injunctions against infringers who engage in delaying tactics or do not respond diligently with a good faith counter-offer' (2015) 37 European Intellectual Property Review 741, 743; Maume P, 'Huawei ./. ZTE, or, how the CJEU closed the Orange Book' (2016) 6 Queen Mary Journal of Intellectual Property 207, 224; Jacob R and Milner A, 'Lessons from Huawei v. ZTE' (2016) 1, 11 available at https://www.4ipcouncil.com/download_file/view_inline/182 accessed on 1 September 2019.

²²⁷ For a detailed analysis on SEP litigation in Germany see Tsilikas H, 'Enforcement of FRAND Commitments and Competition Law Litigation of Standard-Essential Patents in Germany Post-Huawei' in Tavassi M and Muscolo G (eds), *The Interplay Between Competition Law and Intellectual Property: An International Perspective* (Alphen aan den Rijn, The Netherlands, Wolters Kluwer, 2019) 1, 385; Larouche P and Zingales N, 'Injunctive Relief in the EU – Intellectual Property and Competition Law at the Remedies Stage' in Contreras JL (ed) *The Cambridge Handbook of Technical Standardization Law: Competition, Antitrust, and Patents* (Cambridge University Press 2017) 1, 430.

Regarding the pre-litigation notice by a SEP holder, the German courts have adopted different approaches as to what information should be provided by the SEP holder with the notice of infringement to meet the requirements of the test. Initially, some district courts adopted a stricter stance requiring clarifications for the calculation of FRAND royalties,²²⁸ whereas others adopted a more lenient one stipulating that the publication number of the infringed SEPs and the infringing use sufficiently meets the requirements of the *Huawei* test.²²⁹ This is illustrative of the disparity between the different standards that the courts could adopt regarding the content of the initial notice of infringement. The lack of certainty could be particularly problematic for SEP holders as it could create confusion about the essential features that a notice should consist of to be compliant with the *Huawei* test. Thus, this could lead to unfair results either for SEP holders or SEP users.

A second ambiguity that has arisen is whether the initial offer of a SEP holder should be truly a FRAND offer.²³⁰ The Higher Regional Court Düsseldorf ruled that a SEP holder should clarify the methodology used in the offer with which the royalty rates are calculated and all the essential information, such as comparable license

²²⁸ In *Pioneer v Acer* the District Court of Mannheim adopted a strict stance requiring claim charts (technical explanation) for the disputed patents to be included in the notice. Similarly, in *NTT DoCoMo* the Regional Court ruled that the notice should clearly describe the alleged infringing actions. LG Mannheim, *Pioneer v. Acer*, decision of 8 January 2016, 7 O 96/14, juris, para. 114 ff; LG Mannheim, *Philips v. Archos*, decision of 1 July 2016, 7 O 209/15, juris, para. 110; Düsseldorf Higher Regional Court, *Sisvel v Haier*, decision of 30 March 2017, I-15 U 66/15.

²²⁹ LG Düsseldorf, *Saint Lawrence v Vodafone*, Judgment dated 31 March 2016, Case No. 4 O 126/14; OLG Düsseldorf, *Sisvel v Haier*, decision of 30 March 2017, I-15 U 66/15, juris, para. 172.

²³⁰ See Bruzzone G and Capozzi S, 'Collaborative Standardisation and SEP Licensing: A EU Policy Perspective', in Tavassi M and Muscolo G (eds), *The Interplay Between Competition Law and Intellectual Property : An International Perspective* (Alphen aan den Rijn, The Netherlands, Wolters Kluwer, 2019) 1, 7.

agreements, showing that the offer is FRAND-compliant.²³¹ Further, the Higher Regional Court of Karlsruhe ruled that the SEP holder is required to submit a genuine FRAND offer, triggering the step-by-step procedure of the *Huawei* test.²³² In contrast, the UK High Court in *Unwired Planet* held that the criteria laid down in the *Huawei* test are only illustrative and not “a series of rigid predefined rules”.²³³ Therefore, it adopted a less strict view on the matter, emphasising that “a rate can be higher than the FRAND rate without being abusive too”²³⁴ and “[...] only an offer which is so far above FRAND as to act to disrupt or prejudice the negotiations themselves [...] will fall foul of Art 102(a).”²³⁵ The threshold that Justice Birss set in this case is not whether an offer is FRAND or non-FRAND but whether the offer could allow the negotiations to move forward without reaching a deadlock. The disparity between the approach of the German and the UK Courts is further illustrative of the confusion as to the interpretation of the step-by-step guidance of the *Huawei* test. This is particularly problematic since the national courts would adjust the test based on their principles and interpretations stemming from their settled case law.

Third, in terms of the worldwide SEP licensing, the Court of Appeals in the *Unwired Planet*, upholding the High Court judgment, ruled that it is appropriate for a judge to set a worldwide FRAND rate for SEP licenses when the parties are unable

²³¹ Düsseldorf Higher Regional Court, *Sisvel v Haier*, decision of 30 March 2017, I-15 U 66/15.

²³² Karlsruhe Higher Court (Oberlandesgericht Karlsruhe), *Pioneer v Acer* (2016) Case No. 6 U 55/16.

²³³ *Unwired Planet International Ltd v. Huawei Technologies Co. Ltd* [2017] EWHC (Pat) 711.

²³⁴ *Ibid* 757. The Court posited that a non-FRAND offer could be when “making extreme offers and taking an intransigent approach” or when “it would be too easy for the recipient of an offer to throw up their hands and refuse to negotiate at all.”

²³⁵ *Ibid* 765.

to agree one.²³⁶ This was also the subject matter in *Pioneer v Acer* where the Mannheim District Court found that the defendant has inappropriately limited a worldwide FRAND offer to Germany.²³⁷ Although the Regional Court of Mannheim in *Saint Lawrence* held that a worldwide licence could constitute a FRAND offer, it did not indicate if the licensee's counteroffer covering a narrower territory could be FRAND-compliant.²³⁸ While it appears that the UK and German national courts are willing to adjudicate on determining worldwide SEP licences, there is the risk of forum-shopping. In such a scenario, SEP holders may strategically choose to litigate in a jurisdiction that provides more favourable conditions for their interests in setting worldwide FRAND royalty rates.

Further, commentators have pointed to a gap in the CJEU decision related to the analysis of the theory of harm. Unlike the EU Commission's analysis in *Motorola* on the theory of exploitative abuse,²³⁹ critics have posited that the CJEU's analysis was based merely on the theory of exclusionary abuse (i.e. refusal to license as a means to foreclose competition) rejecting AG Wathelet's proposal for an analysis on exploitation.²⁴⁰ As understood in the context of subsequent case law, La-

²³⁶ Ibid 1029 (Pat).

²³⁷ However, on appeal the Karlsruhe Court of Appeals ruled that the FRAND offer was assessed at a superficial level whereas a full assessment was required before bringing an action against an alleged infringer. Mannheim District Court, 8 January 2016, 7 O 96/14 - *Pioneer v Acer*; Karlsruhe Court of Appeal, 31 May 2016, 6 U 55/16.

²³⁸ *Saint Lawrence Communications v Deutsche Telekom*, OLG Karlsruhe 23 April 2015, 6 U 44/15. See Zingales N, 'The Legal Framework for SEP Disputes in the EU Post-Huawei: Whither Harmonization?' (2017) 36 Yearbook of European Law 628, 662.

²³⁹ Supra note 187 *Motorola* at 329–406.

²⁴⁰ Supra note 222 Rato M and English M at 110; supra note 210 Tsilikas H at 172; Brankin S-P, Cisnal de Ugarte S and Kimmel L, 'Huawei: Injunctions and Standard Essential Patents-Is Exclusion a Foregone Conclusion' (2015) 30 Antitrust 80, 84; supra note 227 Larouche P and Zingales N at 424.

rouche and Zingales posited that “[n]ot only has this [theory of harm] led to confusion in the post-*Huawei* case law, and the extension of *Huawei* beyond exclusionary cases, but in practice the *Huawei* choreography has become unmoored from any theory of harm.”²⁴¹ Therefore, it can be said that the Court overlooked the relevance of anticompetitive implications of patent holdup which could have been sufficiently covered under an analysis of exploitative abuse.

The Court eschewed labelling of patent holdup as an anticompetitive conduct and focused only on the exclusionary effects of the abuse to the downstream market.²⁴² Indeed, by remaining silent as to the abusive exploitation, the Court left the path open for SEP holders to escape antitrust liability for tactics that are exploitative in their nature but not exclusionary. Specifically, the *Huawei* test creates a “ritual” that stands in for FRAND that requires the parties to communicate a specific number of times. However, nothing here addresses whether those communications comprise, in substance, fair, reasonable and non-discriminatory terms. This prescribed ritual cannot of itself, therefore, rectify patent holdup. For instance, SEP holders could forge a patent strategy compliant to the *Huawei* test to obtain the ‘safe harbour’ (e.g., with monopolist pricing and unfair, and possibly discriminatory – if not quite exclusionary) terms. Compliance with the formal, but cosmetic, steps would allow the SEP holder to exert pressure over the licensees to accept these non-

²⁴¹ Ibid Larouche P and Zingales N at 430.

²⁴² Petit N, ‘Huawei v. ZTE: Judicial Conservatism at the Patent-Antitrust Intersection’ (2015) 10 CPI Antitrust Chronicles, 1, 3; Brankin S-P, de Ugarte SC and Kimmel L, ‘Huawei/ZTE: Towards a More Demanding Standard of Abuse in Essential Patent Cases’ (2016) 7 Journal of European Competition Law & Practice 520, 523; Zingales N, ‘The Legal Framework for SEP Disputes in EU Post-Huawei: Whither Harmonization?’ (2017) 1, 21 available at <https://papers.ssrn.com/abstract=3017102> accessed on 1 September 2019.

FRAND terms by seeking injunctive relief on then seeming legitimate grounds. Geradin, based on anecdotal evidence, highlighted that a SEP holder can circumvent the framework of the test by using border detention measures on imported products to coerce SEP users to agree on licensing terms that are not necessarily FRAND-compliant.²⁴³ Against this backdrop, the negotiation steps prescribed in the *Huawei* test could be inapposite to protect SEP users and competition equilibrium making opportunism harder to identify by the national courts.

Despite that legitimate expectations created based on the irrevocable FRAND commitment of a SEP holder were central to the analysis of the decision, the CJEU did not provide any insight on FRAND either from an economic perspective or from a normative one. As Wienstroth and Herrmann suggest, FRAND commitments should not be considered as ‘generous’ practice, but instead they should be treated as a prerequisite that secures SEP holders’ participation in standard setting.²⁴⁴ The context in which FRAND commitments are given is vague. As outlined above, ETSI requires members to irrevocably grant FRAND licences when participating in standard setting. However, the ETSI IPR policy does not delineate any substantive requirements or implications, including sanctions, if FRAND commitments are not honoured post-standardisation. Therefore, in the context of ETSI IPR Policy, FRAND commitments could be given merely, ex-ante, as a form of immunity from

²⁴³ Geradin D, ‘Huawei v ZTE Three Years Later: Where Do We Stand on FRAND?’ (OxFirst Webinar, on 17 December 2018).

²⁴⁴ Wienstroth H and Herrmann N, ‘EU: IP & Antitrust’ (Global Competition Review, 2016) available <<http://globalcompetitionreview.com/benchmarking/the-european-middle-eastern-and-african-antitrust-review-2017/1067817/eu-ip-antitrust>> accessed on 1 September 2019.

competition scrutiny, and to promoting an implicit trust in the standardisation process between competing industry participants. Hence, FRAND commitments may be seen as ‘soft commitments’ that serve commercial standards.²⁴⁵ Conversely, FRAND commitments should be more than a declaration of good will but rather a pledge that bears a more substantial and concrete meaning and inducing responsibilities that create legitimate expectations. Otherwise, there is the risk that FRAND becomes a hollow concept or, worse, an instrument of opportunism.

Finally, the ruling has divided scholars and has created a seeming confusion as to the precedent established by the Commission in its decisions in relation to the ‘willing licensee’ concept. On the one hand, some scholars have asserted that the CJEU has broadly confirmed the Commission’s approach by refining the Commission’s.²⁴⁶ On the other, some scholars have interpreted the CJEU’s ruling as it took a different stance on the matter.²⁴⁷ Rato and English have contended that the decision provided antitrust immunity for SEP holders ‘as long as’²⁴⁸ they follow the procedural steps delineated in the decision.²⁴⁹ Despite that the *Huawei* test is a less ‘SEP licensee friendly’ approach compared to the Commission’s, the decision’s wording hints at the departure from the ‘willing licensee’ concept. The Court in its decision

²⁴⁵ Petit N, ‘EU Competition Law Analysis of FRAND Disputes’ in Contreras JL (ed) *The Cambridge Handbook of Technical Standardization Law: Competition, Antitrust, and Patents* (Cambridge University Press 2017) 292.

²⁴⁶ Supra note 226 Batista PHD and Mazutti GC at 247-248; Grasso R, ‘The ECJ Ruling in Huawei and the Right to Seek Injunctions Based on FRAND-Encumbered SEPs under EU Competition Law: One Step Forward’ (2016) *World Competition* 213; Little DR, Subiotto Qc R and Lepetska R, ‘The Application of Article 102 TFEU by the European Commission and the European Courts’ (2016) 7 *Journal of European Competition Law & Practice* 288, 292.

²⁴⁷ Supra note 242 Petit N at 294.

²⁴⁸ Supra note 201 in *Huawei* at para 71.

²⁴⁹ Supra note 222 Rato M and English M at 111.

used the ‘willing to negotiate’ wording to refer to standard implementers that are willing to negotiate on FRAND terms. This suggests that the Court may have sought to avoid a link with the Commission’s concept of ‘willing licensee’, but it set a new legal standard disconnected from any previous concepts.

2.6 Conclusion

This chapter distilled the development of the patent holdup theory and its application to the ICT standard setting. Patent holdup theory has been developed under the economic theory of holdup and threads of the former are intricately linked with ancillary theories which examine the complex setting of patented technologies in standard setting. Despite opposition regarding the validity of the theory of patent holdup and the limited empirical evidence or studies to date, opportunism in standard setting is factual as has been acknowledged by competition authorities and the industry. Further, the lack of empirical data did not prevent the competition authorities across the globe from taking steps and address what they see as the problem of patent holdup.

This chapter also mapped the soft-law mechanisms, namely ETSI policies and Horizontal Guidelines, against holdup. It demonstrated gaps and discrepancies found in the regulatory system and has shown that standard setting is still susceptible to patent holdup. These gaps can be found in ETSI’s IPR Policy and Guide. Particularly, the ETSI IPR Policy fails to include any definition of FRAND terms that could facilitate the process of licensing SEPs; nor the ETSI Guide on IPRs provides no guidance to its members about best practices to avoid patent holdup during the negotiations process post-standardisation like it does for patent ambush.

ETSI is reluctant to engage with the issue of patent holdup. The lack of thorough guidance on patent holdup issues from ETSI raises questions as to the effectiveness of its policies that additionally focus merely on the ex ante disclosure requirement and the licensing of SEPs on FRAND terms without imposing any sanctions on members who breach ETSI rules and policies. This study theorises that ETSI policies are oversimple and too lax to tackle opportunism initiated by ETSI members. This may account for most patent holdup cases involving ETSI standards. Another consideration not lightly dismissed is that ETSI was not part of the CEN/CENELEC Workshop Agreement, nor did it adopt analogous principles of best practice like its counterpart ESOs. As will be shown in the following chapters, ETSI appears not to wish to dissatisfy industry or discourage its participation by adopting more drastic measures against patent holdup. Thus, the study in the following chapters will also seek the reasons for such a stance, venturing to attribute this to capture.

Further, the task to strike the right balance between IPRs exercise and standard setting is remarkably difficult. However, the existing standardisation regulatory and policy mechanisms are inefficient to protect standard setting from patent holdup. In spite of the Commission's and CJEU's endeavours via the Horizontal Guidelines and the discussed precedent, respectively, to create a safe harbour for SEP users, patent holdup appears to remain a great threat. A reason for this is that both, the Commission and the CJEU, have insufficiently dealt with patent holdup, the implications of FRAND commitments, the role of the standardisation bodies, the licensing of FRAND-encumbered patents, and the conditions where injunctions may amount to an abuse of dominance.

The *Huawei* test, which is the primary resort for the licensing parties and the courts to assess anticompetitive conduct, creates divergent results among the EU jurisdictions. What is more, there is no unified approach to the interpretation of the steps outlined in the test; hence, each court proceeds with its own interpretative tools to evaluate the circumstances for each case. However, this is problematic as it deepens fragmentation amongst the European Member States and vagueness that promotes uncertainty. As the study suggests these problems/issues should be addressed with an overhaul using competition law-based tools in order to holistically address the issue of patent holdup.

The next chapter builds on the conceptual framework of regulatory capture by discussing the regulatory modes of the European standardisation system and analysing the theories of regulation with an emphasis on principal-agent theory in order to show the linkage of patent holdup with the concept of regulatory capture in the standardisation process. This analysis will permit the review of patent holdup from a regulatory perspective as well as the devising of more efficient solutions to mitigate patent holdup in the concurrent chapters.

3 SYNTHESIS OF REGULATORY CAPTURE IN STANDARD SETTING

3.1 Introduction

The previous chapter analysed the issue of patent holdup in the EU standard setting and the loopholes in the regulatory framework of standard setting, including ETSI's IPR Policy, as well as the insufficiency of the *Huawei* test to prevent patent holdup. This chapter continues this exploration, seeking to establish whether patent holdup could be attributed to the regulatory capture in standard setting by piecing together theories of regulation and capture applicable to the context of standard setting.

The chapter is divided in three main parts: it first outlines the origins of technical harmonisation in Europe regarding policy making and regulatory reform for the realisation of the Single Market. This covers the regulatory transformation and transition from the Old Approach to the New Approach as well as the creation of ETSI. Based on a historical overview of the European governance and regulatory evolution, the second part of this chapter will review the theoretical foundations of the co-regulatory model in standard setting and will conjoin them with the agency theory. Unpacking the framework of the agency theory, agency capture will be stressed when the agent's interests do not coincide with those of the principal's. The chapter will conclude with the application of the agency theory in standard setting,

and patent holdup will be justified based on the hypotheses and the assumptions of the agency capture theory.

3.2 Origins of Technical Harmonisation – An Overview

This section discusses the importance of technical harmonisation in the formation of the European Single Market. It provides an overview of the ‘Europeanisation’ of technical regulation along the regulatory reforms the Europe underwent with an emphasis on the establishment of the co-regulatory regime of standard setting between the Commission and ETSI.

Looking at the origins of EU market governance and regulatory activity via technical harmonisation, the formation and evolution of the then European Community and European Single Market are intrinsic components of the historical analysis. To eliminate the theretofore-national fragmentation of the market, the Commission utilised various legislative, regulatory and policy tools. One of these, technical harmonisation (standardisation process) was paramount to the removal of technical trade barriers.¹ Behind the trade barriers there were national interests intertwined with domestic product standards.² As will be shown subsequently, the Commission articulated this technical harmonisation as one of the central regulatory tools in its 1985 White Paper on ‘Completing the Internal Market’.³

¹ Bieber R and Amarelle C, ‘Simplification of European Law’ in Snyder FG (ed) *The Europeanisation Of Law: The Legal Effects of European Integration* (Hart 2000) 236.

² McGee A and Weatherill S, ‘The Evolution of the Single Market: Harmonisation or Liberalisation’ (1990) 53 *The Modern Law Review* 578.

³ European Commission, White Paper from the Commission to the European Council ‘Completing the Internal Market’ COM (85) 310 final, 14 June 1985.

Before the creation of the Single European Market, Member States had a protectionist stance against collective practices, safeguarding their individual national markets with public ownership and government-administered bodies as a mode of regulation (positive paradigm).⁴ A core issue facing the early European Economic Community was the fragmentation of the Single Market caused by divergent trade-related national rules, regardless of protectionist motives. Having adopted the 1968 Customs Union that phased out tariff-based barriers among Member States, it needed to address the remaining non-tariff barriers to trade for facially non-protectionist reasons such as health of citizens, quality and safety of products, consumer or environmental protection, that still comprised a significant impediment to the free movement of goods and the Single Market. Despite their trade neutral facade, these technical trade barriers were often national protectionist measures in the guise of national domestic product quality and safety technical standards.

The neo-liberal paradigm including privatisation and deregulation vastly affected the development of the European governance and policymaking with the abolition of domestic barriers by the governing Member States.⁵ Privatisation and deregulation were the foundations of the systematisation and transformation of the Member States from positive and interventionist (*dirigiste*) governments providing

⁴ Schepel H, *The Constitution of Private Governance: Product Standards in the Regulation of Integrating Markets* (Hart Pub 2005) 6.

⁵ That shift of governance structure was implemented in order to establish and deepen economic, market, and monetary integration between the various Member States, and to form European Union. Loughlin J, 'The "Transformation" of Governance: New Directions in Policy and Politics' (2004) 50 *Australian Journal of Politics & History* 8, 19; Ogus AI, *Regulation: Legal Form and Economic Theory* (Bloomsbury Publishing 2004) 10; Swann D, 'The Regulatory Scene: an Overview' in Button K & Swann D (eds) *The Age of Regulatory Reform* (Macmillan, Londres 1989).

most services to regulatory ones merely overseeing such provision via rule making.⁶ With the failure of the public-monopolies and the positive paradigm,⁷ deregulation, re-regulation and the delegation of ownership and/or regulatory responsibilities to private or semi-private bodies became the driving force in Europe for the Europeanisation of the market.⁸

As discussed later, negative integration was introduced via the legal system for the creation of the Single Market project and the liberalisation of the domestic markets (market-making regulation).⁹ This required the elimination of national restrictions to the free movement of goods and services, the correction of national monopolies and market dominance, and the protection of consumers' interests.¹⁰

⁶ Majone G and others, *Regulating Europe* (Routledge 1996); Majone G, *Temporal Consistency and Policy Credibility: Why Democracies Need Non-Majoritarian Institutions* (European University Institute 1996); Majone G, 'From the Positive to the Regulatory State: Causes and Consequences of Changes in the Mode of Governance' (1997) 17 *Journal of Public Policy* 139; Majone G, *Independent Agencies and the Delegation Problem: Theoretical and Normative Dimensions* In *Political Institutions and Public Policy* (Springer 1997); Majone G, 'The Rise of the Regulatory State in Europe' (1994) 17 *West European Politics* 77; Majone G, 'Nonmajoritarian Institutions and the Limits of Democratic Governance: A Political Transaction-Cost Approach' (2001) 157 *Journal of Institutional and Theoretical Economics (JITE)* 57; Latzer M and others, 'Regulation remixed: Institutional change through self and co-regulation in the mediamatics sector' (2003) 50 *Communications & Strategies* 127; Marks G and Hooghe L, 'European integration from the 1980s: State-centric v. multi-level governance' (1996) 34 *Journal of Common Market Studies* 341.

⁷ Ibid Majone G and others, *Regulating Europe*, 15.

⁸ Ibid 23.

⁹ Negative integration was a policy triggered by the CJEU in 1970s paving the way to the establishment of supranationalism and core concepts such as free movement with the abolishment of non-tariff barriers. J Weiler, 'The Transformation of Europe' (1991) 100 *Yale LJ* 2403, 2431–2453; Case 120/78 *Rewe-Zentral AG v Bundesmonopolverwaltung für Branntwein* [1979] ECR 649; Pitarkis JY and George G, 'Joint Dynamics of Legal and Economic Integration in the European Union' (2003) 16 *Eur J of L and Econ* 357; Carrubba C and Murrah L, 'Legal Integration and Use of the Preliminary Ruling Process in the European Union' (2005) 59 *International Organization* 399; M Van Empel, 'The 1992 Programme: Interaction Between Legislator And Judiciary' (1992) *LIEI* 1; Stone Sweet A, 'European Integration and the Legal System' in Börzel TA and Cichowski RA (eds), *The State of the European Union : Law, Politics, and Society* (Oxford University Press USA - OSO 2003) 1, 18.

¹⁰ Majone G, *Dilemmas of European Integration: The Ambiguities and Pitfalls of Integration by Stealth* (Oxford University Press 2005) 155.

Yet, the negative integration was coupled with positive integration through the approximation of laws and the adoption of European Market Regulations (market-correcting regulation).¹¹ As further discussed below, along negative and positive integration,¹² models of deregulation and re-regulation of domestic policies were set up to satisfy the needs for the approximation of laws between the Member States.

Against this backdrop, technical harmonisation, i.e. standard setting, was a dual tool of negative and positive integration. Based on Article 100 (now Article 114 TFEU) of the EEC Treaty (Treaty of Rome),¹³ the European Community (now European Union) has been empowered to approximate laws for the integration of the

¹¹ Armstrong K and Bulmer S, *The governance of the Single European Market* (Manchester University Press, 1998), 146; Joerges C, 'The Market without the State? The Economic Constitution of the European Community and the Rebirth of Regulatory Politics' (1997) 1 European Integration online Papers (EIoP) 1, 10.

¹² According to Tinbergen all processes of economic integration consist of positive and negative integration. The former is related to the elimination of obstacles, while the latter to the harmonisation and the co-ordination of existing instruments. Tinbergen J, *International economic integration* (Amsterdam : Elsevier 1954).

Scharpf sufficiently describes negative and positive integration: "[...] negative integration refers to the removal of tariffs, quantitative restrictions, and other barriers to trade or obstacles to free and undistorted competition. Positive integration, by contrast, refers to the reconstruction of a system of economic regulation at the level of the larger economic unit. The distinction is not completely synonymous with a second one between 'market-making' and 'market-correcting' policy interventions." Scharpf F, 'Negative and Positive Integration' in *Governing in Europe: Effective and Democratic?* (Oxford University Press 1999) 45. See also De Schutter O, Lebessis N and Paterson J, 'Governance in the European Union' (2011) Cahiers of the Forward Studies Unit1, 24; Scharpf F, 'Negative and Positive Integration in the Political Economy of European Welfare States' in Rhodes M and Mény Y (eds), *The Future of European Welfare: A New Social Contract?* (Palgrave Macmillan UK 1998).

¹³ Article 100, under Chapter 3 titled 'Approximation of Laws', provided that: "The Council shall, acting unanimously on a proposal from the Commission and after consulting the European Parliament and the Economic and Social Committee, issue directives for the approximation of such laws, regulations or administrative provisions of the Member States as directly affect the establishment or functioning of the common market." European Union, Treaty Establishing the European Community, Rome Treaty, 25 March 1957.

market. The introduction of technical harmonisation, however, spawned re-regulation requiring the replacement of national technical regulations with pan-European ones and conformity of products to technical specifications.¹⁴

During the pre-harmonisation era, national standards constituted an impediment to the free movement of goods and products. National Standard Organisations (NSOs) were building standards and technical specifications on their own capacity intensifying the fragmentation of the market with the creation of a wide array of non-tariff barriers.¹⁵ However, the first EU attempt to harmonise technical regulation came with the introduction of the ‘General Programme’,¹⁶ also known as ‘Old Approach’, an envisaged programme of EU technical harmonisation to supplant the nationally-based framework. Nevertheless, as will be discussed in the following sections, this approach soon proved incapable of resolving the dissonance among diverse technical regulations with a resulting legal and economic quagmire.

3.2.1 From the Old to the New Approach

The European Council in 1968 laid down the framework of the General Programme, consisting of four Council Resolutions and a Gentlemen’s Agreement, that

¹⁴ The Commission banned all (national) measures that imposed restrictions to imports and had as a result additional cost. See European Commission, ‘Directive based on the provisions of Article 33 (7), on the abolition of measures which have an effect equivalent to quantitative restrictions on imports and are not covered by other provisions adopted in pursuance of the EEC Treaty’ 70/50/EEC, OJ L 13, 22 December 1969.

¹⁵ Garrett G, ‘International Cooperation and Institutional Choice: The European Community’s Internal Market’ (1992) 46 *International Organization* 533; Dehousse R, ‘Integration v. Regulation? On the Dynamics of Regulation in the European Community’ (1992) 30 *JCMS: Journal of Common Market Studies* 383.

¹⁶ European Council Resolution, ‘General Programme of 28 May 1969 for the elimination of technical barriers to trade which result from disparities between the provisions laid down by law, regulation or administrative action in Member States’ OJ C 76, 17 June 1969.

set three phases for the issuance of numerous technical harmonisation Directives intended to be completed by 1971.¹⁷ The General Programme undertook the law approximation policy, the principle of mutual recognition of conformity assessment as well as it deployed a notification procedure and a standstill provision for national legislation that covered products in the General Programme.¹⁸

However, this approach proved too ambitious, and, ultimately, the framework remained unrealised due to its inherent flaws.¹⁹ It was a cumbersome process, ill-suited to the extensive scope of full EU technical harmonisation as it required Member States to negotiate and agree unanimously²⁰ to Directives that involved the drawing up of technical specifications on a product-by-product or possibly component-by-component basis, akin to the national standards they sought to supplant.²¹ The high degree of detail was time-consuming and counterproductive.²² As a result,

¹⁷ European Council Resolution, 'General Programme of 28 May 1969 for the elimination of technical barriers to trade which result from disparities between the provisions laid down by law, regulation or administrative action in Member States' OJ C 76, 17 June 1969.

¹⁸ Ibid; See Falke J and Joerges C, 'Traditional Law Approximation Policy Approaches to Removing Technical Barriers to Trade and Efforts at a Horizontal European Product Safety Policy' (2010) 6(2) *Hanse Law Review* 237, 248.

¹⁹ The Commission hoped to adopt 124 Directives within a period of eighteen months while only ten directives came to life by the end of 1970. Egan M, *Regulating European markets: Mismatch, reform and agency* (ProQuest Dissertations Publishing 1996); Baldwin RE, McLaren J and Panagariya A, 'Regulatory Protectionism, Developing Nations, and a Two-Tier World Trade System [with Comments and Discussion]' (2000) *Brookings Trade Forum* 237, 257.

²⁰ Ibid Baldwin; Organisation for Economic Co-operation Development (OECD), *Regulatory Co-operation for an Interdependent World* (OECD 1994) 1, 53.

²¹ European Commission, Staff Working Paper 'The 1996 Single Market Review: Background Information For The Report To The Council And European Parliament' (1996) SEC (96) 2378, 22-23; Rensberger RA, Zande Rvd and Delaney H, 'Standards setting in the European Union, standards organizations and officials in EU standards activities' (1997) 18; Jacques Pelkmans, 'The New Approach to Technical Harmonization and Standardization' (1987) 25 *JCMS: Journal of Common Market Studies* 249, 252; Farr S, *Harmonisation of Technical Standards in the EC* (John Wiley & Sons, 1996) 1, 4; Harm S, *The Constitution of Private Governance : Product Standards in the Regulation of Integrating Markets* (Hart Publishing, 2005) 1, 63.

²² Economic and Social Committee, 'Opinion on the problems of trade barriers and the alignment of laws in this area', OJ C 72, 24 March 1980, 8; Supra note 19 in Baldwin RE, McLaren J and Panagariya at 258; Lovecy J, *The Transformation of Governance in the European Union* (Routledge 2003) 1, 136.

national standard bodies had developed national technical specifications at a greater pace opposed to the harmonised ones. Also, even when agreement had been reached a Member State would often thereafter adopt its own additional technical requirements for, e.g. product safety, thereby affecting the ability of products not meeting these new requirements to be imported into that Member State.

This meant that EU harmonization was interminable and its Single Market objective undermined.²³ The delays in promulgating and implementing the planned EU harmonisations encountered the further headwinds of enhanced national protectionism caused by the 1970's recession.²⁴ As a result of Member State foot dragging in the EU legislative process and domestic implementation, and also, in light of the greater national resources available to national governments, national technical specifications proliferated at a greater number than that of the EU harmonised ones.²⁵ Indeed, although the General Programme contemplated adoption of 124 Directives within a year and a half and more in the follow-on phases, only 150 technical barrier Directives had been achieved by 1985 (nearly twenty years after).²⁶ This was a paucity in light of the thousands of existing technical domestic standards comprising barriers to free movement. Additionally, the vested political interests of national

²³ Davies GT, *EU Internal Market Law* (2nd ed., Cavendish 2003) 147.

²⁴ The severe recession that occurred in the 1970s that triggered the re-emergence of neo-protectionism, led the Member States to strive to protect their national interests "not only against non-Members but also against one another." European Commission, 'Europe Without Frontiers - Completing the Internal Market (2nd ed. European Documentation)' (1988) 1, 11 available at <http://aei.pitt.edu/1553/> accessed 1 September 2019.

²⁵ Schütze R, *From International to Federal Market: The Changing Structure of European Law* (First edn, Oxford University Press 2017) 1, 125; Emerson M, *The Economics Of 1992 : The E.C. Commission's Assessment of The Economic Effects of Completing The Internal Market* (Oxford University Press 1988) 1, 21; supra note 18 in Falke J and Joerges C at 264.

²⁶ Zúñiga Schroder H, *Harmonization, Equivalence and Mutual Recognition of Standards in WTO Law* (Wolters Kluwer Law & Business Distributed in North, Central and South America by Aspen Publishers, Inc 2011) 149-150.

protectionism following the 1970s recession, combined with the unanimity principle further impeded negotiations and ultimate decision-making required for harmonised technical regulations, creating a significant loss of momentum.²⁷

As will be examined below, the effort to eliminate trade barriers in the European market through technical harmonisation did not stop with the General Programme's failure. Rather, in 1985, the European institutions launched a new scheme, called the 'New Approach'. This was facilitated, however, by certain interim legal and policy developments. The first breakthrough came with the 'Low-Voltage Directive'²⁸ where the concepts of 'harmonised' standards at Community level and the 'presumption of conformity' were introduced for the first time marking a departure from the command-and-control method of Article 100 of the EEC Treaty.²⁹ In essence, the Directive set consumer safety as an overarching goal allowing the standardisation bodies to define technical specifications that would be in compliance with the Directive.

²⁷ See supra note 11 in Joerges C at 14 (noting that "[t]he decisive weaknesses were instead seen exclusively in the notorious bottlenecks in the European legislative process: the hurdles of the unanimity rule of Art. 100 EEC and the difficulty of using a harmonization of 'legal and administrative provisions' to achieve the practically so important transformation of private sets of norms in a way that would conform with integration.")

²⁸ European Council of Ministers, Council Directive on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (Low-voltage Directive) 73/23/EEC, 19 February 1973.

²⁹ Ibid, Article 5; European Commission, 'Vademecum on European Standardisation – Part I: General framework' (2003) 1, 2; Purnhagen K, *The Politics of Systematization in EU Product Safety Regulation: Market, State, Collectivity, and Integration* (Springer Netherlands 2013) 1, 8; For further details on how the Low-Voltage Directive revolutionised technical harmonisation see Joerges C and others, 'European Product Safety, Internal Market Policy and the New Approach to Technical Harmonisation and Standards' (1997) <http://hdl.handle.net/1814/46244> accessed 1 September 2019.

Second, judicial response came into play. The landmark CJEU decisions in *Dassonville*³⁰ and *Cassis de Dijon*³¹ can be said to have facilitated various concepts for the approximation of laws that underpin the New Approach. These included interpretation of Articles 30 and 36 of the EEC Treaty regarding the prohibition of national quantitative restrictions on the free movement of goods and measures having equivalent effect, and permitted derogations from these for national measures restricting imports to protect public safety, security, and health.³² These changes introduced in two phases.

The first phase came with the *Dassonville* judgment.³³ A case where Dassonville imported Scotch whisky in Belgium, which was previously circulated in France, without having a certificate from British authorities confirming the designation of origin. Following the prosecution by the Belgian authorities, Dassonville claimed that the Belgian laws constituted measures having equivalent effect to quantitative restrictions (MEQR). In this case the CJEU provided a wider interpretation of the scope of Article 30 of the EEC Treaty (now Article 34 TFEU) than previously conceived, famously known as the ‘Dassonville formula’. The Court held that all national laws hindering trade among Member States “directly or indirectly, actually or

³⁰ Case 8/74 *Procureur du Roi v Benoît and Gustave Dassonville* [1974] ECR 837.

³¹ Case 120/78 *Rewe Zentrale v. Bundesmonopolverwaltung für Branntwein (Cassis de Dijon)* [1979] ECR 649.

³² Alter KJ and Meunier-Aitsahalia S, 'Judicial Politics in the European Community: European Integration and the Pathbreaking Cassis de Dijon Decision' (1994) 26 *Comparative Political Studies* 535; White EL, 'In Search of the Limits to Article 30 of the EEC Treaty' (1989) 26 *Common Market Law Review* 235; Mortelmans K, 'Article 30 of the EEC treaty and legislation relating to market circumstances: time to consider a new definition?' (1991) 28 *Common Market Law Review* 115.

³³ *Supra* note 30 *Dassonville*.

potentially, intra-Community trade are to be considered as measures having equivalent effect to quantitative restrictions” under Article 30 of the EEC Treaty.³⁴ Further in its judgment, the CJEU found that there were no expressly unreasonable measures in place by Belgian law, yet it interpreted Article 36 broadly to include arbitrary discrimination/restriction of intra-Union trade.³⁵ As a result the Court ruled that the certificate of authenticity constituted a MEQR.³⁶ Against this backdrop, the CJEU defined for the first time the concept of MEQR as well as prepared the ground for further development of the concept of ‘rule of reason’ in the case of *Cassis de Dijon* allowing a wider interpretation of exceptions found in Article 36 of the EEC Treaty.³⁷

The second phase was introduced in *Cassis de Dijon*,³⁸ where the Court affirmed and built on the *Dassonville* judgment. In this case, the CJEU stated that in

³⁴ *ibid* para 5 at 852.

The notion of quantitative restrictions was first conceived in the *Geddo* case where the court defined that as: “measures which amount to a total or partial restraint of, according to the circumstances, imports, exports or goods in transit”. (Case 2/73 *Geddo v Ente Nazionale Risi* [1973] ECR 865) Article 2 of the Directive 70/50 defined the distinctly and indistinctly applicable measures in a non-exhaustive list where the importing state was able to discriminate against goods. Commission Directive 70/50/EEC of 22 December 1969 based on the provisions of Article 33 (7), on the abolition of measures which have an effect equivalent to quantitative restrictions on imports and are not covered by other provisions adopted in pursuance of the EEC Treaty [1970] OJ L 13/17.

³⁵ Paragraphs 6 and 7 stated that: “[i]n the absence of a community system guaranteeing for consumers the authenticity of a product’s designation of origin, if a Member State takes measures to prevent unfair practices in this connection, it is however subject to the condition that these measures should be reasonable and that the means of proof required should not act as a hindrance to trade between Member States and should, in consequence, be accessible to all community nationals[.]” and “[e]ven without having to examine whether such measures are covered by Article 36, they must not, in any case, by virtue of the principle expressed in the second sentence of that Article, constitute a means of arbitrary discrimination or a disguised restriction on trade between Member States.” See *supra* note 30 *Dassonville* at paras 6-7

³⁶ *Ibid* para 9: “Consequently, the requirement by a Member State of a certificate of authenticity which is less easily obtainable by importers of an authentic product which has been put into free circulation in a regular manner in another Member State than by importers of the same product coming directly from the country of origin constitutes a measure equivalent to a quantitative restriction as prohibited by the Treaty.”

³⁷ Leucht B, 'The Policy Origins of the European Economic Constitution' (2018) 24 *European Law Journal* 191; Schütze R, 'Re-reading' *Dassonville*: Meaning and Understanding in the History of European Law' (2018) 24 *European Law Journal* 376.

³⁸ *Supra* note 31 *Cassis de Dijon*.

the absence of EU harmonised rules, it is up to Member States to regulate the production and marketing of products (here alcoholic beverages). The doctrine of ‘rule of reason’ established in *Dassonville* was built further in this case with the adoption of the so-called ‘mandatory requirements’ permitting national laws with reasonable policy to impede the principle of free movement. Particularly, according to the Court, obstacles to free movement arising from disparate national provisions can be tolerated where they are necessary for such reasons as fiscal regulation, commercial fairness, consumer protection and public health.³⁹

In that case, the CJEU found unpersuasive the proffered health justification for the German regulation prohibiting import of alcoholic beverages with a lower alcohol content than 25% that these could induce a tolerance to alcohol.⁴⁰ It also found the measure disproportionate to achieve a stated consumer protection goal of ensuring no unfair competitive advantage adhered to the lower level imports based on the higher constituent taxes of alcohol as a percentage of the drink costs.⁴¹ Effectively, the German regulation was not necessary for possible rationales to restrict free movement.

The CJEU then stated that there was no valid reason why, providing that these were lawfully produced and marketed in a Member State, that alcoholic beverages should not be introduced into another Member State.⁴² This language is iden-

³⁹ Ibid para 8.

⁴⁰ Ibid, para 1 (noting that many lower level drinks were available on the national market).

⁴¹ Ibid at para 12. Transparent labelling rules could suffice to bring this to the consumer’s attention. See para 13.

⁴² Ibid para 14.

tified as leading to the principle of ‘mutual recognition’ under which products conforming to national regulations of one Member State can *ipso facto* be sold into another.⁴³ Undoubtedly, the ruling played a seminal role to overcome difficulties in the regulatory and legislative process of the creation of the Single Market. Having a deregulatory effect through negative integration, it fostered the integration process and removed the regulatory competence from the Member States to block imported goods using national rules.⁴⁴ In response to the judgment, the Commission endorsed and reinforced the mutual recognition principle which then became not only the core of its strategy to secure free movement of goods and services but also one of the core elements of the New Approach.⁴⁵

⁴³ Ibid. One commentator has suggested that it was not the Cassis judgment itself, that arguably recognised reasonable rules to restrain trade, but rather the Commission’s expansive interpretation of it and ensuing political use to foster a new harmonisation agenda that made it such a significant case. See Karen J Alter, Sophie Munier-Aitsahalia, ‘Judicial Politics in the European Community: European Integration and the Pathbreaking Cassis de Dijon Decision’, *Comparative Political Studies*, Vol 26 No. 4, 4 January 1994, 535, 539-41.

⁴⁴ Weiler J, ‘From Dassonville to Keck and beyond: an evolutionary reflection on the text and context of the free movement of goods’ in Craig PP and De Burca G (eds), *The evolution of EU law* (1st edn, Oxford University Press 2009) 349; Kerber W and Van den Bergh R, ‘Mutual Recognition Revisited: Misunderstandings, Inconsistencies, and a Suggested Reinterpretation’ (2008) 61 *Kyklos* 447; Laffan B, ‘The European Union Polity: A Union of Regulatory, Normative and Cognitive Pillars’ (2001) 8 *Journal of European Public Policy* 709; Alter KJ and Meunier-Aitsahalia S, ‘Judicial Politics in the European Community: European Integration and the Pathbreaking Cassis de Dijon Decision’ (1994) 26 *Comparative Political Studies* 535.

⁴⁵ European Commission, ‘Communication from the Commission concerning the consequences of the judgment given by the Court of Justice on 20 February 1979 in Case 120/78 (‘Cassis de Dijon’) [1980] OJ C256/2, 3 October 1980.

3.2.2 Regulatory Reform through Delegation and Co-Regulation

As mentioned above, the regulatory technique of the Low-Voltage Directive of 1973 coupled with the *Dassonville* and *Cassis* CJEU rulings were the catalyst to the reformation of the European technical harmonisation.⁴⁶ In 1983, the Council of the European Communities adopted the 83/189/EEC Directive, also known as ‘Mutual Information (or Transparency) Directive’.⁴⁷ It laid down a number of requirements as to the drafting and the introduction of technical regulations by the Member States, but its core achievement was the notification requirement (or “early warning mechanism” as coined by Egan),⁴⁸ under which a Member State was obliged to notify the Commission and other Member States before the adoption of national technical regulations. The underlying purpose of the notification procedure was to synchronise the Commission’s work and the Member State’s initiatives on the issuance of technical regulations.⁴⁹ In particular, the Directive provided a mechanism whereby the national standardisation was subject to open and collective scrutiny on a pan-

⁴⁶ Purnhagen K, *The Politics of Systematization in EU Product Safety Regulation: Market, State, Collectivity, and Integration* (Springer Netherlands 2013) 11.

⁴⁷ Council Directive 83/189/EEC of 28 March 1983 laying down a procedure for the provision of information in the field of technical standards and regulations, OJ L 109/8, 26 April 1983.

Amended with: Council Directive 88/182/EEC Amending Directive 83/189/EEC laying down a procedure for the provision of the information in the field of technological standards and regulations [1988] OJ L81/75; Commission Decision 90/230/EEC Amending the lists of standardization institutions set out in the Annex to Council Directive 83/189/EEC [1990] OJ L 128/15; Commission Decision 92/400/EEC Amending the lists of standardization institutions annexed to Council Directive 83/189/EEC [1992] OJ L 221/55; The European Parliament and the Council Directive 94/10/EEC Materially amending for the second time Directive 83/189/EEC laying down a procedure for the provision of information in the field of technical standards and regulation [1994] OJ L 100/30; Commission Decision 96/139/EC Amending the list of national standardization bodies in Annex II to Council Directive 83/189/EEC [1996] OJ L 32/31; The European Parliament and the Council Directive 98/34/EC Laying down a procedure for the provision of information in the field of technical standards and regulations [1998] OJ L 204/37.

⁴⁸ Egan M, 'Setting Standards: Strategic Advantages in International Trade' (2002) 13 *Business Strategy Review* 51, 55.

⁴⁹ *Supra* note 47 Directive 83/189/EEC Articles 4 and 5 of the Directive.

European level conducted with the close co-operation of the Commission and the European standards bodies.⁵⁰ Member States, although had to pertain to the notification requirement before adopting national technical regulations, nonetheless were able to autonomously shape the technical specifications of products if they meant to comply with the essential requirements laid down by the New Approach directives.⁵¹

The Mutual Information Directive was another step marking Commission's deviation from the Old Approach. The phaseout of the Old Approach followed with the application of a new regulatory technique and strategy, that of co-regulation. The complete manifestation of the co-regulatory model, i.e. co-operation between the Commission and ESOs, occurred in Europe in mid 1980s with the adoption of the Resolution on the 'New Approach to Technical Harmonisation and Standards' by the Council following the footsteps of the CJEU on the historic *Cassis de Dijon* ruling.⁵²

The official documents introduced and set out new procedural and legislative steps to revisit technical harmonisation in Europe.⁵³ One of the key elements was the

⁵⁰ Ibid Articles 7 to 9 of the Directive.

⁵¹ Dehousse R, '1992 and Beyond: The Institutional Dimension of the Internal Market Programme' (1989) 16 *Legal Issues of Economic Integration* 109, 115.

⁵² European Council Resolution of 7 May 1985, on a new approach to technical harmonization and standards [1985] 85/C 136/01; European Commission, 'Communication from the Commission to the Council and to the European Parliament on Technical harmonization and standards: a new approach' [1985] COM (85) 19 final; supra note 3; Schepel H, *Legal Aspects of Standardisation in the Member States of the EC and EFTA : Volume 1 : Comparative Report* (Luxembourg : Office for Official Publications of the European Communities, 2000) 22; Chalmers D, Davies G and Monti G, *European Union Law: Text and Materials* (Third edn, Cambridge University Press, 2010) 1, 371; Verbruggen P, 'Does Co-Regulation Strengthen EU Legitimacy?' (2009) 15 *European Law Journal* 425.

⁵³ The fundamental principles that the New Approach established were: i) the prevention of new technical barriers; ii) the drawing up of harmonised standards (legislative harmonisation), conforming to essential requirements, which are established and elaborated by specific Directives; iii) the development and adoption of harmonised standards by EU Standards bodies via European mandates;

incorporation of the ‘essential requirements’ principle, wherein New Approach Directives for technical harmonisation used to be setting basic but essential requirements ensuring safety and other general and public interests for the manufacturing of products.⁵⁴ Linked to that principle, the development of technical standards for products conforming with the essential requirements was to be carried out by the ESOs. As outlined in the documents, the adoption of harmonised standards by these bodies remained voluntary. However, with their adoption, conformity with the essential requirements principle would be automatically presumed.

The implementation of the ‘New Approach’ strategy was based on a more concrete programme of technical harmonisation at a regional level, and a frontier-free internal market.⁵⁵ This regulatory strategy was reinforced by the White Paper on ‘Completing the Internal Market’,⁵⁶ where the Commission proposed a revised common standardisation system to overcome the barriers created by various and different national standards across the Member States.⁵⁷ In its proposal, the Commission adopted the mutual recognition principle after the *Cassis de Dijon* decision as the foundation for minimum co-ordination of national rules and legislations.⁵⁸

iv) compliance with the standards remains voluntary; and v) in light of the mutual recognition of national rules principle, the Member States are obliged to presume that products conform with the essential requirements set out in the Directives (presumption of conformity). See European Commission, ‘Guide to the Implementation of Directives Based on the New Approach and the Global Approach’ (2000) 1, 7.

⁵⁴ Supra note 3 6-7. As with other sectors, the harmonised regulation has the “dual purpose of ensuring free movement of goods through the technical harmonisation of entire sectors and guaranteeing a high level of protection of the public interest objectives referred to in Article 114(3) TFEU (e.g. toys, building materials, machines, gas appliances and telecommunications terminal equipment).” European Parliament, ‘Free movement of goods | EU fact sheets | European Parliament’ (2019) available at http://www.europarl.europa.eu/ftu/pdf/en/FTU_2.1.2.pdf accessed on 1 September 2019.

⁵⁵ Supra note 21 in Farr S.

⁵⁶ Supra note 3.

⁵⁷ Ibid para 13.

⁵⁸ Ibid para 58, 77.

According to the White Paper, the European Institutions would initiate a broad co-operation with ESOs. After the setting out in Directives of broader, harmonised, requirements essential for product safety or other requirements in the general public interest, the ESOs would be entrusted with the direct development and issuance of technical European standards needed to produce and market products meeting the essential requirements.⁵⁹

Co-regulation in standard setting, however, was not incidental. The advent and pace of technological breakthroughs played a remarkable role in policymaking change.⁶⁰ A constant pressure for regulatory and infrastructure change in telecommunications emerged as national monopolist providers, often state-owned, proved slow to accommodate this technological influx.⁶¹ Therefore, the European Institutions implemented the model of co-regulation to respond to the slow progress of technical harmonisation, the increasing phenomena of ‘red tape’,⁶² and the tenacious fragmentation of trade and erection of trade barriers in the European market.⁶³ The Commission identified this new co-regulatory infrastructure to speed up technical

⁵⁹ Ibid 67-69

⁶⁰ Sandholtz W, ‘Institutions and Collective Action: The New Telecommunications in Western Europe’ (1993) 45 *World Politics* 242.

⁶¹ Ibid; Dunnewijk T and Hultén S, ‘A Brief History of Mobile Communication in Europe’ (2007) 24 *Telematics and Informatics* 164.

⁶² European Commission, ‘Action Plan for the Single Market’, CSE(97)1 final, 4 June 1997; Noam EM, *Telecommunications in Europe* (Oxford University Press 1992) 62.

⁶³ Eckert S, ‘European Regulatory Governance’ in Levi-Faur D (ed) *Handbook on the Politics of Regulation* (Edward Elgar 2011) 513.

harmonisation as necessary to achieve economic and social cohesion, industrial competitiveness, and product innovation.⁶⁴

The synergy between the ESOs and the European Institutions marked also an institutional change, which opened the way for a more decentralised approach of regulation.⁶⁵ This was apparent with the supranational implications of the New Approach Directives. Therefore, the direct involvement of ESOs in the process of technical harmonisation stimulated a co-regulatory regime and marked the beginning of the 'agencification' paradigm in Europe,⁶⁶ wherein the European standardisation bodies were primarily delegated to collectively determine and produce harmonised standards, conforming to the essential requirements of the New Approach Directives. The next section discusses the establishment of ETSI as part of the Commission's new strategy to refine the technical harmonisation in Europe with an institution dissimilar from others.

⁶⁴ Council Of The European Communities, 'Council Directive 83/189/EEC of 28 March 1983 laying down a procedure for the provision of information in the field of technical standards and regulations' (1983) L 109/8 Official Journal of the European Communities ; White Paper from the Commission to the European Council 'Completing the Internal Market' [1985] COM (85) 310 final.

⁶⁵ European Commission, White Paper on European Governance, COM (2001) 428 final, 25.7.2001; Latzer M and others, 'Regulation Remixed: Institutional Change Through Self And Co-Regulation in the Mediamatics Sector' (2003) 50 Communications & Strategies 127, 130-131; McGee A and Weatherill S, 'The Evolution of the Single Market – Harmonisation or Liberalisation' [1990] 53 The Modern Law Review 578, 584.

⁶⁶ See 3.3.1.

3.2.3 Establishment of ETSI

Following the transformation of the legislative approach to technical harmonisation, introduced with the New Approach, in 1987, the Commission signalled the need for regulatory change in the telecommunications sector with the Green Paper on ‘The Development of the Common Market for Telecommunications Services and Equipment.’⁶⁷ Among its various proposals, the liberalisation of telecoms and the rapid development of harmonised standards bringing community-wide interoperability of services and products were highlighted.⁶⁸ The Green Paper also addressed the need for a Single Market in telecommunications envisaging the creation of a new European standardisation body that would facilitate this objective.

One of the main factors contributing to the need for this new institution was the inability of the ‘Conference des administrations Europeennes des Postes et Telecommunications/European Conference of Postal and Telecommunications Administrations (CEPT), a voluntary non-EU coordinating body for European states’ postal and telecommunication organisations, to develop harmonised standards in a timely fashion as per Commission’s requests.⁶⁹ CEPT was blamed as too lenient with national standardisation bodies, leading to the slow introduction of harmonised telecommunication standards and the preservation of trade barriers in the common

⁶⁷ European Commission, *Towards a Dynamic European Economy, Green Paper on The Development of the Common Market for Telecommunications Services and Equipment*, COM (87) 290 final, 30 June 1987.

⁶⁸ *Ibid* 8-9.

⁶⁹ Batura O, *Universal Service in WTO and EU Law : Liberalisation and Social Regulation in Telecommunications* (1st edn, T.M.C. Asser Press 2016) 1, 120-21.

market.⁷⁰ This created friction between the Commission and CEPT with the former trying to expand its authority to reform the telecoms sector.⁷¹

Another factor was that only national standards bodies were allowed to participate in the standardisation process under the auspices of CEPT with industry participants eliminated from the standard setting.⁷² Faced with the constant pressure to build competitive pan-European technical standards and infrastructure for telecommunications and related industries in Europe, CEPT founded ETSI.⁷³

To rectify CEPT's weaknesses, three fundamental principles, governing ETSI's operations were introduced: i) the development of harmonised standards; ii) the adoption of weighted voting system, unlike the other two ESOs – CEN/CENELEC; and iii) broad participation of administrations, public network operators, manufacturers, users, private service providers and research bodies in standard setting.⁷⁴ Further, CEPT transferred the development of the Global System for

⁷⁰ Temple S, 'Trends in Telecommunications Standardization at the European Level' (1988) 11 *Computer Communications* 181, 184; Bekkers R and Seo D, *Quick scan for best practices in ICT standardization: What ETSI could learn from other standards bodies* (Commissioned by the Directorate of Energy and Telecommunications, Dutch Ministry of Economic Affairs Utrecht, Netherlands: Dialogic, 2008) 13.

⁷¹ The topic on the reform of telecoms sector is further discussed in 5.3.1.1.

⁷² See Goodman JW, *Telecommunications policy-making in the European Union* (Edward Elgar 2006) 1, 50; Schneider V and Dang-Nguyen G, 'Corporate Actor Networks in European Policy-making: Harmonizing Telecommunications Policy' (1994) 32 *Journal of Common Market Studies* 473, 481-482.

⁷³ European Commission, *Towards a Dynamic European Economy, Green Paper on The Development of the Common Market for Telecommunications Services and Equipment*, COM (87) 290 final, 30 June 1987, 20 -23; Fuchs G, 'Policy-making in a system of multi-level governance - the Commission of the European Community and the restructuring of the telecommunications sector' (1994) 1 *Journal of European Public Policy* 177, 185.

⁷⁴ Besen SM, 'The European Telecommunications Standards Institute - a Preliminary - Analysis' (1990) 14 *Telecommunications Policy* 521, 522.

Mobile Communications (GSM) standard to ETSI.⁷⁵ CEPT initiated the development of the GSM standard in 1982 and established the so-called ‘Group Speciale Mobile’ working group to build a pan-European standardised cellular network to reconcile previously incompatible technologies.⁷⁶ ETSI, then, with the direct participation of industry stakeholders, finalised and approved the specifications for the GSM standard.⁷⁷

As discussed in this section the task of market integration and harmonisation through technical regulation underwent three main phases. The first phase was launched with the General Programme, which was proven too optimistic and failed to succeed. This was followed by the judicial contribution addressing tariff barriers to trade, a breakthrough enforced via negative integration and deregulation. The third phase introduced with the redevelopment of the approach to technical regulation and the adoption of the New Approach to legislative harmonisation coupled with the establishment of ETSI and the co-regulatory regime between the Commission and ESOs. The creation of ETSI marked the departure from normal practices of centred regulation, with its participation from a broader array of industry actors. It conducted not only a standardisation body, dissimilar from its predecessors, but

⁷⁵ Dunnewijk T and Hultén S, ‘A Brief History of Mobile Communication in Europe’ (2007) 24 *Telematics and Informatics* 164, 167; Bekkers R, *Mobile telecommunications standards: GSM, UMTS, TETRA, and ERMES* (Artech House 2001) 1, 303.

⁷⁶ Bekkers R, Duysters G and Verspagen B, ‘Intellectual property rights, strategic technology agreements and market structure: The case of GSM’ (2002) 31 *Research Policy* 1141, 1146; Council Directive ‘on the frequency bands to be reserved for the coordinated introduction of public pan-European cellular digital land-based mobile communications in the Community’ 87/372/EEC of 25 June 1987.

⁷⁷ For a timeline on the development of GSM standard see GSMA, ‘Brief History of GSM & the GSMA’ available at <https://www.gsma.com/aboutus/history> accessed on 1 September 2019.

also to the advent of an accelerator of ICT standards in the European market. European standardisation has, thus, played a fundamental role to the reduction of intra-Union barriers as well as the competitiveness of the European industry.

The next section focuses on the underpinning regulatory models of the European standardisation system, mainly compounded of better regulation, co- and self-regulation. The remaining sections then build on the principal – agent relationship and set the scene for the conceptualisation of the agency problem and capture in standard setting.

3.3 EU Regulatory Regimes and Theories

New modes of governance, introduced with the formation of the Single Market and the proliferation of independent regulatory agencies (IRAs) and self-regulatory agencies (SRAs) in Europe,⁷⁸ changed the dynamics of regulation and stimulated the interest of regulatory theorists. The transfer of regulatory/discretionary powers from the regulator to specialised agencies has generated increased interest in regulatory studies.⁷⁹ Majone, one of the leading theorists in regulatory studies, offered a comprehensive theory on the dismantling of the traditional regulation (command-and-control model) in Europe and the positive state which was replaced with

⁷⁸ Geradin D and Petit N, 'The Development of Agencies at EU and National Levels: Conceptual Analysis and Proposals for Reform' (2004) 1, 4 available at <https://ssrn.com/abstract=489722> accessed on 1 September 2019; Busuioc EM, *European Agencies: Law and Practices of Accountability* (Oxford University Press 2013) 1; Hofmann HCH, 'Mapping the European Administrative Space' (2008) 31 *West European Politics* 662, 668.

⁷⁹ Robert EG and John B, 'The Regulatory State?' in Goodin RE (ed) *The Oxford Handbook of Political Science* (Oxford University Press 2011) 219.

the 'regulatory state' alongside the adoption of privatisation, liberalisation, deregulation and re-regulation methods for the integration of the Single Market.⁸⁰

Technical harmonisation, as described above, became the prime example of the EU regulatory strategy of deregulation, re-regulation, and delegation. In the aftermath of this delegation, regulation and governance have radically transformed in Europe. In Europe, IRAs/SRAs quickly became the central feature of the 'regulatory state'. Thatcher provides a concise account of their features: "[t]hey are created by legislation; hence elected officials are their principals. They are organisationally separate from governments and headed by unelected officials. They are given powers over regulation, but are also subject to controls, inter alia by elected politicians, both

⁸⁰ Majone G, 'From the Positive to the Regulatory State: Causes and Consequences of Changes in the Mode of Governance' (1997) 17 *Journal of Public Policy* 139; Majone G, 'The Regulatory State and its Legitimacy Problems' (1999) 22 *West European Politics* 1; Majone G, *Deregulation or Re-Regulation? : Policymaking in the European Community since the Single European Act* (European University Institute, 1993); Bergman T, Müller WC and Strøm K, 'Introduction: Parliamentary democracy and the chain of delegation' (2000) 37 *European Journal of Political Research* 255, 257; Thatcher M, 'Regulation after delegation: independent regulatory agencies in Europe' (2002) 9 *Journal of European Public Policy* 954.

To this point of analysis, it is useful to note that the notion of the regulatory state first emerged in the US regulatory literature. Factors such as the bureaucratic expansion of US agencies and privatisation conduced to the growth of the regulatory state analysis in the US. See Anderson JE and Redford ES, *The Emergence of the Modern Regulatory State* (Public Affairs Press 1962); McCubbins MD, 'The Legislative Design of Regulatory Structure' (1985) 29 *American Journal of Political Science* 721; Calvert RL, McCubbins MD and Weingast BR, 'A Theory of Political Control and Agency Discretion' (1989) 33 *American Journal of Political Science* 588; Epstein D and O'Halloran S, *Delegating Powers: A Transaction Cost Politics Approach to Policy Making under Separate Powers* (Political Economy of Institutions and Decisions, Cambridge University Press 1999); Spiller PT and others, *Regulation, Institutions and Commitment : The British Telecommunications Sector* (World Bank 1994). Seidman H and Gilmour R, *Politics, Position and Power : From the Positive to the Regulatory State* (New York: Oxford University Press) 1986); Risk RCB, 'Lawyers, Courts, and the Rise of the Regulatory State' 9 *Dalhousie Law Journal* 31; DeLong JV, 'New Wine for a New Bottle: Judicial Review in the Regulatory State' (1986) 72 *Virginia Law Review* 399; Shapiro SA and Levy RE, 'Heightened Scrutiny of the Fourth Branch: Separation of Powers and the Requirement of Adequate Reasons for Agency Decisions' (1987) *Duke LJ* 387; Sunstein CR, 'Interpreting Statutes in the Regulatory State' 103 *Harvard Law Review* 405; Sunstein CR, 'On the costs and benefits of aggressive judicial review of agency action' (1989) *Duke LJ* 522.

in the executive and legislature.”⁸¹ These agencies, therefore, offloaded the increased political pressure and unpopular supranational regulation mandates,⁸² while addressing the lack of policy-makers’ expertise and their information inequality, e.g., industry practice, needed for the harmonisation of the EU market. This resulted in the continued propagation of outsourcing of regulatory functions to IRAs and SRAs.⁸³ This delegation, therefore, brought non-majoritarian institutions to the front and rendered them among the main actors in decision-making and a common institutional form in Europe.⁸⁴

The following sections will review the emergence of co-regulation in EU with the application of the New Approach and the establishment of ETSI considered to be a decisive evolution of the EU market governance. The introduction of the co-regulatory model in standard setting via delegation in the 1980s was well-justified. Yet, the efficiency of this regulatory model should be re-examined for possible deficiencies under theories of regulation. This is warranted since, in accordance with Morgan and Yeung, regulatory theories compile a set of hypotheses to clarify the

⁸¹ Thatcher M, ‘Delegation to Independent Regulatory Agencies in Western Europe’ (Workshop on “National Regulatory Reform in an Internationalised Environment”, ECPR Joint Sessions of Workshops, Grenoble, 6-11 April 2001).

⁸² Supra note 80 in Majone G, ‘The Regulatory State and its Legitimacy Problems’; Supra note 6 in Majone G, ‘The Rise of the Regulatory State in Europe’ 77; supra note 6 in Majone G and others, *Regulating Europe*, 13; supra note 80 Majone G, ‘From the Positive to the Regulatory State: Causes and Consequences of Changes in the Mode of Governance’ (1997); Van Ooik R, ‘The Growing Importance of Agencies in the EU: Shifting Governance and the Institutional Balance’, in Curtin D M and Wessel R A (eds), *Good Governance and the European Union: Reflections on Concepts, Institutions and Substance* (Antwerp: Intersentia 2005) 127.

⁸³ Supra note 6 in Majone G and others, *Regulating Europe*, 40-41.

⁸⁴ Thatcher M, *The Politics of Telecommunications : National Institutions, Convergence, and Change In Britain And France* (Oxford University Press 1999); Thatcher M, ‘Delegation to Independent Regulatory Agencies in Western Europe’, (2001) Paper presented to the workshop on “National Regulatory Reform in an Internationalised Environment”, ECPR Joint Sessions of Workshops, Grenoble, 6-11 April 2001.

emergence of regulation, the participation of actors in the regulatory process, and the interaction between these actors.⁸⁵

This study aims to establish the emergence of patent holdup as a potential malfunction in the co-regulatory model of standard setting. The following sections will expound on the theoretical model of the agency theory to examine the co-regulatory regime which is founded on the agency relationship between the Commission and ETSI. This analysis will unpack the theoretical framework in which the co-regulatory regime is based on and will facilitate the identification of agency problems and regulatory capture. The next section examines the emergence of co- and self-regulation in the standardisation process, pertaining to the 'better regulation' paradigm, as a means to achieve a more efficient technical harmonisation in Europe. It then outlines the agency theory, the theoretical construct of co-regulation. Theories of public and private interest are discussed underpinning the discussion of the agency problem and capture. The purpose behind this analysis is to establish a theoretical framework to the examination of the principal-agent model in the ICT standardisation in Europe and the probability of capture.

3.3.1 Better, Co- and Self-Regulation & Agency Theory

The co-regulatory model, adopted by the Commission for achieving the internal market, is premised on the delegation of rulemaking from public authorities to

⁸⁵ Morgan B and Yeung K, *An Introduction to Law and Regulation: Text and Materials* (Law in Context, Cambridge University Press 2007) 16.

private bodies, aiming at the liberalisation of the trade.⁸⁶ Specifically, the Commission has transferred regulatory powers to the ESOs, including ETSI, to develop and deliver harmonised standards based on Commission's mandates.⁸⁷ As previously noted, in its White Paper on 'European Governance', the Commission endorsed the creation of ETSI and its regulatory mode, namely self-regulation in parallel with co-regulation.⁸⁸

Co-regulation and self-regulation are threads of private regulation which officially entered into the European *acquis* with the implementation of the New Approach for technical harmonisation; they transformed European governance.⁸⁹ Both regulatory methods have been promoted since and used as a better mode of EU governance and part of EU's strategy on better regulation for better law-making.⁹⁰ As will be shown in Chapter 5, the Commission has recently employed a series of policy initiatives based on 'better regulation' to modernise the European standardisation system and to complete the Digital Single Market.

⁸⁶ European Economic and Social Committee, 'European Self- and Co-Regulation', available at https://www.eesc.europa.eu/resources/docs/auto_coregulation_en--2.pdf accessed on 1 September 2019; Schepel H, *The Constitution of Private Governance : Product Standards in the Regulation Of Integrating Markets* (Hart Pub 2005) 256; Hamilton RW, 'Prospects for the Nongovernmental Development of Regulatory Standards' (1982) 32 Am UL Rev 455; Medzmariashvili M, 'Delegation of Rule-making Power to European Standards Organizations: Reconsidered' (2017) Legal Issues of Economic Integration 353, 355; Hofmann HCH, Rowe GC and Türk AH, *Administrative Law and Policy of the European Union* (Administrative Law and Policy of the European Union, Oxford University Press 2011) 1, 587; Micklitz H-W, 'European Integration Through Standardization: How Judicial Review is Breaking Down the Club House of Private Standardization Bodies' (2013) Common Market Law Review 145.

⁸⁷ For a discussion on the legal basis of this delegation see 3.4.1.

⁸⁸ Surpa note 3.

⁸⁹ Hatzopoulos V, *Regulating Services in the European Union* (Oxford University Press 2012) 292; European Parliament, Council and Commission, Interinstitutional Agreement on Better Lawmaking [2003] OJ C321/1; Supra note 63 in COM (2001) 428 final.

⁹⁰ Ibid OJ 2003 C321/1; Garben S and Govaere I, 'The Multi-faceted Nature of Better Regulation' in Garben S and Govaere I (eds), *The EU Better Regulation Agenda: A Critical Assessment* (Hart Publishing 2018) 1, 16.

Better regulation,⁹¹ a regulatory paradigm based on improvement of the regulatory process with low-intervention controls by using rational approaches,⁹² was originally adopted to simplify the legislative process in the internal market.⁹³ According to the Commission, the purpose of better regulation is neither to increase or decrease EU legislation nor to deregulate but rather to ensure that the regulatory

⁹¹ Since the conception of better regulation, the Commission has advanced it in two phases. First, in 2001, following previous initiatives of the Commission towards the simplification of the legislative process, namely the launching of the pilot project known as the Simplification of Legislation in the Internal Market (SLIM) programme, the Commission's White Paper on European Governance and the adoption of the "Mandelkern Group Report on Better Regulation" opened the path to the adoption of better regulation. Subsequently, the Commission released a series of Communications on better law-making and impact assessment. Second, in 2005, the Commission revised the guidelines of better regulation with the issuance of the communications on 'Better regulation for growth and jobs in the European Union' and 'Smart Regulation in the European Union'. Lastly, in 2015, the Commission refined its approach to better regulation releasing its communication on 'Better regulation for better results: An EU agenda' adopting a set of new guidelines to enhance the core elements of the better regulation, i.e. RIA, REFIT, and consultations, focusing as well on the strengthening of the subsidiarity and proportionality principles of EU legislation.

See European Commission, Communication on Simpler Legislation For The Internal Market (SLIM): A Pilot Project, COM(96) 204 final; European Commission, Mandelkern Group on Better Regulation Final Report, (2001) available at http://ec.europa.eu/smart-regulation/better-regulation/documents/mandelkern_report.pdf accessed on 1 September 2019; European Commission, White Paper on 'European Governance' COM (2001) 428 final; European Commission, Communication on Impact Assessment, COM(2002) 276 final; European Commission, Communication on Action Plan "Simplifying and improving the regulatory environment", COM(2002) 278 final; European Commission, Communication on 'Towards a reinforced culture of consultation and dialogue - General principles and minimum standards for consultation of interested parties by the Commission', COM(2002) 704 final; European Commission, Communication on Better Regulation for Growth and Jobs in the European Union, COM(2005) 97 final; European Commission, Communication on Smart Regulation in the European Union, COM(2010) 543 final; European Commission, Impact Assessment Guidelines, SEC(2005) 791, 15 June 2005; European Commission Communication, on 'Better regulation for better results: An EU agenda' COM(2015) 215 final, 19.5.2015; European Commission, 'Better Regulation Guidelines' SWD (2017) 350.

⁹² Baldwin R, 'Better Regulation: The Search and the Struggle' in Martin C and others (eds), *The Oxford Handbook of Regulation* (Oxford University Press 2010) 1, 263-264; Knill C and Lenschow A, 'Modes of Regulation in the Governance of the European Union: Towards a Comprehensive Evaluation' in Jordana J and Levi-Faur D (eds), *The Politics of Regulation: Institutions and Regulatory Reforms for the Age of Governance* (Edward Elgar 2004) 1, 218.

⁹³ Scott points out that: "EU policies on Better Regulation originated in the process to complete the Single Market in the early 1990s. Their focus was not directly on reducing burdens on business, but rather on defining the appropriate relationship between EU-level and domestic-level measures, with an attempt to give priority to the latter." See Scott C, 'Integrating Regulatory Governance and Better Regulation as Reflexive Governance' in Garben S and Govaere I (eds), *The EU Better Regulation Agenda: A Critical Assessment* (Hart Publishing 2018) 15.

objectives are met through the use of (better regulation) tools for better law-making.⁹⁴ The core tools consist of ex ante regulatory impact assessment (RIA) via a cost-benefit analysis, ex post evaluation (termed as the Regulatory Fitness Programme (REFIT)),⁹⁵ external stakeholder engagement through consultations, and reduction of the administrative burden.⁹⁶

Regulatory impact assessment, one of the central pillars of the EU's better regulation agenda, has been used since mid 1990s and promoted by international organisations, such as the Organization for Economic Co-operation and Development (OECD), as an instrument to a more coherent regulatory policy.⁹⁷ The purpose of RIA is to identify the positive and negative impact of the proposed policy actions on an evidence-based analysis, in contrast to the ex-ante evaluation focusing on the

⁹⁴ European Commission Communication, on 'Better regulation for better results: An EU agenda' COM(2015) 215 final, 19.5.2015.

⁹⁵ The REFIT programme was launched in 2012 and was renewed periodically ever since. According to the Commission the REFIT programme "aims to cut red tape, remove regulatory burdens, simplify and improve the design and quality of legislation so that the policy objectives are achieved and the benefits of EU legislation are enjoyed at lowest cost and with a minimum of administrative burden, in full respect of the Treaties, particularly subsidiarity and proportionality. Under REFIT, the Commission is screening the entire stock of EU legislation on an ongoing and systematic basis to identify burdens, inconsistencies and ineffective measures and identified corrective actions." (European Commission, Communication on Regulatory Fitness and Performance Programme (REFIT): State of Play and Outlook, COM(2014) 368 final, p 2.) The outcome of the REFIT programme has positive results as 293 pending legislative proposals have been withdrawn between 2006 and 2014. See European Commission, 'REFIT – Making EU Law Lighter, Simpler and Less Costly' available at http://ec.europa.eu/smart-regulation/docs/refit_update.pdf accessed 1 September 2019.

⁹⁶ European Commission, Staff Working Document on 'Better Regulation Guidelines' SWD(2015) 111 final; European Commission, 'Better Regulation Toolbox' available at http://ec.europa.eu/smart-regulation/guidelines/docs/br_toolbox_en.pdf accessed on 1 September 2019.

⁹⁷ Organization for Economic Co-operation and Development (OECD), 'Regulatory Impact Analysis – Best Practices in OECD Countries' (1997); Kirkpatrick C and Parker D, 'Regulatory impact assessment and regulatory governance in developing countries' (2004) 24 *Public Administration and Development* 333; OECD, *Regulating Policies in OECD Countries* (Paris, 2002); OECD, *Report on Regulatory Reform* (Paris, 1997).

cost-effectiveness of the proposed policy actions.⁹⁸ RIA has a dual function, as a tool and as a decision process.⁹⁹ As a tool, it informs policy makers about the costs and benefits and the effectiveness of the policy proposals as well as about the alternative regulatory and non-regulatory options to achieve these policy proposals.¹⁰⁰ As a decision process, policy makers can use this not only on an ex ante basis to inform the parties affected by the policy proposals, but also on an ex post basis to evaluate the existing regulations.¹⁰¹

Within the ambit of better regulation and RIA, co-regulation and self-regulation are regarded as non-regulatory (soft-law) alternative policy instruments.¹⁰² Although there is a correlation between both regulatory models, co- and self-regulation differ from each other. With co-regulation, the state/public actors share the legislative power with private actors, however, the former maintain their regulatory power. The public actors choose the institutional form of delegation, namely the powers delegated to and controls imposed on the private actors.¹⁰³ More specifically, the EU Institutions have provided a clear-cut definition of co-regulation:

co-regulation means the mechanism whereby a Community legislative act entrusts the attainment of the objectives defined by the legislative authority to parties which are recognised in the field (such as economic operators, the social

⁹⁸ European Commission, Communication on Impact Assessment, COM(2002) 276 final 1, 3; See also C. Radaelli and F. De Francesco, 'Regulatory Impact Assessment' in R. Baldwin, M. Cave, and M. Lodge (eds), *The Oxford Handbook of Regulation* (Oxford, 2010);

⁹⁹ OECD, 'Regulatory Impact Analysis' (2009) 1, 12 available at <https://www.oecd-ilibrary.org/content/publication/9789264067110-en> accessed 1 September 2019.

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

¹⁰² European Commission, Staff Working Document on 'Better Regulation Guidelines' SWD (2017) 350, 1, 22.

¹⁰³ Thatcher M, 'Delegation to Independent Regulatory Agencies: Pressures, Functions and Contextual Mediation' (2002) 25 *West European Politics* 125, 130.

partners, non-governmental organisations, or associations) [...] to reduce the legislative burden by concentrating on essential aspects and to draw on the experience of the parties concerned.¹⁰⁴

To the contrary, self-regulation requires no 'legislative act' or involvement of the state for the policy making of private bodies.¹⁰⁵ Rather it is an optional strategy that governments allow the industry to regulate itself¹⁰⁶ in the 'shadow of hierarchy'.¹⁰⁷ Self-regulation is generally understood to mean that the private actors either individually or collectively control their behaviour and their members by forming an autonomous regime with limited or no governmental participation in the policy

¹⁰⁴ *Supra* note 89 in OJ C 321/3, para 18.

¹⁰⁵ European Commission, Communication from the Commission 'Action plan "Simplifying and improving the regulatory environment"', COM(2002) 278 final, 5.6.2002, 11.

In her seminal article, Julia Black holds the view that: "[w]hatever self-regulation is, it is not state regulation; it must therefore have a natural place in the new 'decentred' regulatory world. It is bound to be contextual, responsive, and does not involve governments in direct steering. Moreover, it seems to overcome the problem of regulating others-the 'others' simply regulate themselves." See Black J, 'Decentring Regulation: Understanding the Role of Regulation and Self-Regulation in a 'Post-Regulatory' World' (2001) 54 *Current Legal Problems* 103, 113.

Ogus provides a definition: "As a legal phenomenon, self-regulation is more usually analysed as a deliberate delegation of the state's law-making powers to an agency, the membership of which wholly or mainly comprises representatives of the firms or individuals whose activities are being regulated." Ogus A and Carbonara E, *'Self-regulation' Production of Legal Rules* (Production of Legal Rules, Edward Elgar Publishing 2011) 232. See also Gunningham N and Rees J, 'Industry Self-Regulation: An Institutional Perspective' (2002) 19 *Law & Policy* 363; Bartle IAN and Vass P, 'Self-Regulation Within the Regulatory State: Towards a New Regulatory Paradigm?' (2007) 85 *Public Administration* 885, 888.

¹⁰⁶ *Ibid* Black J 117.

¹⁰⁷ In general, the shadow of hierarchy is a rationale that is based on the premise that governmental actors control the regulatory process with legislative measures to sustain self-regulation efforts and obtain optimal results. See Héritier A and Eckert S, 'New Modes of Governance in the Shadow of Hierarchy: Self-Regulation by Industry in Europe' (2008) 28 *Journal of Public Policy* 113; Börzel T, 'European Governance: Negotiation and Competition in the Shadow of Hierarchy' (2010) 48 *JCMS: Journal of Common Market Studies* 191; Koenig-Archibugi M, 'Global Regulation' in Martin C and others (eds), *The Oxford Handbook of Regulation* (Oxford University Press 2010) 1, 408-409; Töller A, 'Voluntary Approaches to Regulation – Patterns, Causes and Effects' in Levi-Faur D (eds), *Voluntary Approaches to Regulation – Patterns, Causes and Effects* (Cheltenham, UK: Edward Elgar Publishing, 2011) 1, 501.

making.¹⁰⁸ Self-regulation has been also defined by the EU institutions as “the possibility for economic operators, the social partners, non-governmental organisations or associations to adopt amongst themselves and for themselves common guidelines at European level (particularly codes of practice or sectoral agreements).”¹⁰⁹

Self-regulation can be part of co-regulation in the policy making process that involves private and semi-private bodies.¹¹⁰ This is the case where the governance of private bodies is fundamentally based on self-regulation via devising their own policies and rules.¹¹¹ It is critical to make the distinction that EU ICT standard setting regime is based on a hybrid form of regulation. In particular, the regulatory co-operation between public actors/regulators and private actors/regulated produces co-regulation as a distinct form of regulation. The EU ICT standard setting, therefore, encapsulates both co- and self-regulation. In other words, two modes of regulation should be considered for EU standardisation (see Figure 1): first, the co-regulatory mode of standard setting that involves the synergy between the Commission and

¹⁰⁸ Black J, 'Constitutionalising Self-Regulation' (1996) 59 *The Modern Law Review* 24, 27; Supra note 91 in Baldwin R, Cave M and Lodge M at 137; A. Ogus, 'Rethinking Self-Regulation' (1995) 15 *OJLS* 97; Baggott R and Harrison L, 'The Politics of Self-Regulation' (1986) 14 *Policy and Politics* 143; Bardach E and Kagan RA, *Going By The Book : The Problem of Regulatory Unreasonableness* (Routledge 2017) 217; I. Ayres I and Braithwaite J, *Responsive Regulation: Transcending the Deregulation Debate* (Oxford University Press 1995), ch 4; R. Baggott, 'Regulatory Reform in Britain: The Changing Face of Self-Regulation' (1989) 67 *Public Administration* 435; Graham C, 'Self-Regulation' in G. Richardson and H. Genn (eds), *Administrative Law and Government Action* (Oxford, 1994).

¹⁰⁹ Supra note 89 in OJ C 321/3 para 22.

¹¹⁰ Delegation of standard setting occurs not only at a regional but also at a national level. National SDOs are either private or semi-private bodies usually registered as non-profit associations. For further details see ISO's database at <https://www.iso.org/members.html> accessed on 1 September 2019. Udo D, Wulf R and Wolfgang W, 'The Dynamics of Change in EU Governance' in Udo D and others (eds), *The Dynamics of Change in EU Governance* (Edward Elgar 2011) 28.

¹¹¹ Supra note 89 in Hatzopoulos V at 287; Supra note 108 in Ayres I and Braithwaite J; Short JL, 'From Command-and-Control to Corporate Self-Regulation: How Legal Discourse and Practice Shape Regulatory Reform' (University of California, Berkeley 2008).

ETSI; and second, the self-regulatory mode of ETSI which is, however, governed primarily by private parties/regulatees.



Figure 1, Regulatory Regime of EU ICT Standardisation

The governance and rulemaking of ETSI is member-centred, typically referred to as ‘voluntary self-regulation’. In general, although the concept of self-regulation is less than clear-cut, Freeman offers a useful definition of ‘voluntary self-regulation’ within the context of standard setting. He contends that ‘voluntary self-regulation’ means that a standard setting organisation operates “independently of, and parallel to, government regulation” where “government yields none of its own authority to set and implement standards.”¹¹² A similar definition is given by Knill and Lenschow, who argue that the “ ‘self-regulatory model’ is based on private actors devising concrete regulatory standards – in the shadow of the state”.¹¹³ To put it

¹¹² Freeman J, 'Private Parties, Public Functions and the New Administrative Law' (2000) 52 *Administrative Law Review* 813.

¹¹³ Knill and Lenschow further state that: “The EU calls especially on economic actors to form a private network in order to solve particular problems collectively. The private network is responsible for setting regulatory standards and for ensuring compliance. The dominant mechanism leading to behavioural change relies on the provision of incentives as the self-regulatory approach induces economic actors to comply with rules formulated ‘in their name’ and in view of their needs and capacities.” See Knill C and Lenschow A, 'Modes of regulation in the governance of the European Union: towards a comprehensive evaluation' in Jordana J and Levi-Faur D (eds), *The Politics of Regulation: Institutions and Regulatory Reforms for the Age of Governance* (Edward Elgar 2004) 223.

simply, 'voluntary self-regulation' of standard setting does not require the active involvement of governmental authorities either directly or indirectly.¹¹⁴ This form of regulation is desirable in cases where the regulatory activity requires high levels of expert or technical knowledge, and where the industry's informational basis is superior compared to that of the state/governor.¹¹⁵

In particular, ETSI, due to the strong involvement of industry participants in standard setting, possesses the expertise to build standards and has a greater access to information regarding industry's needs. In this way the Commission is outsourcing rulemaking by authorising ETSI to engage in self-regulation. The rulemaking of standard setting is shared between the Commission and ETSI, where the former designs the overarching goals of technical regulation but the latter defines and specifies it. By contrast, ETSI's regime is based on self-regulation, where the duties and costs are internalised by its members who devise their own rules and compliance administration without outside interference.¹¹⁶ ETSI bodies (e.g. the General Assembly) have the exclusive rulemaking capacity within ETSI.¹¹⁷ Thus, the rules are self-specified and self-enforced, and the conduct of the members is self-monitored.¹¹⁸ It can, therefore, be assumed that self-regulation is intrinsic to the co-regulatory regime of EU ICT standard setting.

¹¹⁴ *Supra* note 108 in Black J at 24.

¹¹⁵ *Supra* note 85 in Morgan B and Yeung K at 93; *Supra* note 108 in Ogus A.

¹¹⁶ See 4.2.2 on the discussion about the structure and governance of ETSI.

¹¹⁷ *Ibid.*

¹¹⁸ Bartle IAN and Vass P, 'Self-Regulation Within the Regulatory State: Towards A New Regulatory Paradigm?' (2007) 85 *Public Administration* 885, 888.

The underpinning theory of co-regulation is the ‘principal-agent’ theory, better known as ‘agency theory’.¹¹⁹ The agency theory examines the relationship of the principal-agent through various assumptions. Although the agency theory was first developed in the ‘new institutional economics’,¹²⁰ its theoretical framework was then diffused into and applied to other fields, i.e. accounting, marketing, political science, sociology, organisational behaviour. In the context of economics, the agency relationship is considered a contractual relationship; the delegated task for which the agent is employed constitutes the elements of the contract between the parties (principal-agent).¹²¹ In political science, the agency theory borrows from the classic economic paradigm and shares a common definition applied into the context of the political system and actors (e.g. lawmakers, elected officials, regulators).

¹¹⁹ Ross SA, 'The Economic Theory of Agency: The Principal's Problem' (1973) 63 *The American Economic Review* 134; Jensen MC and Meckling WH, 'Theory of the Firm: Managerial Behavior, Agency Costs And Ownership Structure' (1976) 3 *Journal of Financial Economics* 305; Arrow KJ, 'Agency and the Market' in *Handbook of Mathematical Economics* (Vol 3, Elsevier 1986) Chapter 23; Pratt JW and Zeckhauser R, *Principals and Agents: The Structure of Business* (Harvard Business School Press 1985).

¹²⁰ Oliver Williamson first coined the term. The theory builds on an interdisciplinary approach combining the literature from transaction cost economics, property rights economics, economic contract theory, public choice with a focus on the role of institutions influencing economic growth. See Williamson OE, *Markets and Hierarchies: Analysis and Antitrust Implications: A Study in the Economics of Internal Organization* (Free Press 1975); Richter R, 'The New Institutional Economics: Its Start, its Meaning, its Prospects' (2005) 6 *European Business Organization Law Review* 161; Coase RH, 'The New Institutional Economics' (1984) 140 *Zeitschrift für die gesamte Staatswissenschaft / Journal of Institutional and Theoretical Economics* 229; Coase RH, 'The Problem of Social Cost' (1960) 3 *Journal of Law and Economics* 1; Coase RH, 'The Nature of the Firm' (1937) 4 *Economica* 386; Coase RH, 'The Theory of the Firm' (1937) 4 *Economica* NS 386–405, reprinted in R. H. Coase, *The Firm, The Market, and The Law* (University of Chicago Press, 1988).

¹²¹ One of the widespread definitions of the agency relationship is: “a contract under which one or more persons (the principal/s) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent. If both parties to the relationship are utility maximisers there is good reason to believe that the agent will not always act in the best interests of the principal.” See Jensen MC and Meckling WH, 'Theory of the firm: Managerial Behavior, Agency Costs and Ownership Structure' (1976) 3 *Journal of Financial Economics* 305, 310.

In the European Union there exists a chain of agency relationships.¹²² While Member States (principals) delegate to the EU institutions (agents) competencies; EU institutions (principal) anticipate that Member States (agents) will implement the policies. This is a versatile agency relationship where both, EU institutions and Member States, concurrently function as principals and agents.¹²³ The agency theory is highly applicable to the delegation of regulatory functions to IRAs/SRAs. In such case, the agency relationship is based on a co-operation between public and private actors, equal to a contractual agreement, that aims to meet policy goals and solve problems.¹²⁴ There is a twofold justification for the employment of the agent: first, the agent possesses expertise and competence in complex and technical matters to perform an activity that it cannot be performed by the principal (division of specialisation);¹²⁵ and second, it reduces the political or economic costs (division of labour) while directly relieving the principal from the burden of regulating.¹²⁶

The agency relationship, however, is not immune to problems. Before the close examination of these problems, public and private interest theories of regulation will

¹²² For a further analysis on this topic see 3.4.1.

¹²³ Bergman T, 'The European Union as the next step of delegation and accountability' (2000) 37 *European Journal of Political Research* 415, 423.

¹²⁴ For Egan, the agency relationship: "[...] is a strategy that enables agents to solve problems for principals." See Egan M, 'Regulating European markets: Mismatch, reform and agency' (ProQuest Dissertations Publishing 1996) 37.

Eisenhardt states that the agency theory: "[...]is directed at the ubiquitous agency relationship, in which one party (the principal) delegates work to another (the agent), who performs that work." See Eisenhardt KM, 'Agency Theory: An Assessment and Review' (1989) 14 *The Academy of Management Review* 57, 58.

¹²⁵ Mitnick BM, *Corporate Political Agency: The Construction of Competition in Public Affairs* (Sage 1993); Coleman JS, *Foundations of Social Theory* (The Belknap Press of Harvard University Press 1994); Kiewiet DR and McCubbins MD, *The Logic of Delegation: Congressional Parties and the Appropriations Process* (University of Chicago Press 1991) 24.

¹²⁶ *Supra* note 80 in McCubbins MD at 723.

be explored in the following section. The deployment of the hypotheses and assumptions of both regulatory theories will operate as the basis to best understand the key concepts of theories of regulation, the dynamics between regulators and regulatees, and the concepts of market failure and capture which are central to the analysis of regulatory intervention and capture, respectively, in this study.

3.3.2 Public and Private Interest Theories of Regulation

Public interest theories of regulation are a strand of the regulatory theories in conventional welfare economics that build on notions of economic efficiency and the correction of inefficient or inequitable market practices via regulatory intervention.¹²⁷ A generally accepted definition of this theorem attributes to the 'benevolent' regulator the protection of the public or the largest number of individuals contrast to private and special interests.¹²⁸ The theory has two variants, the positive and the normative one. The former investigates the actual motives of the regulators and the

¹²⁷ The efficient allocation of resources is based on the Pareto efficiency (after the Italian economist and sociologist Vilfredo Pareto) which dictates that someone can only be made better off when making someone else worse off. See Posner RA, 'Theories of Economic Regulation' (1974) 5 *Bell Journal of Economics* 335; Joskow P and Noll R, 'Regulation in Theory and Practice: An Overview' in Fromm G (ed), *Studies in Public Regulation* (National Bureau of Economic Research, Inc 1981); Becker GS, 'A Theory of Competition Among Pressure Groups for Political Influence' (1983) 98 *The Quarterly Journal of Economics* 371; Levine ME and Forrence JL, 'Regulatory Capture, Public Interest, and the Public Agenda: Toward a Synthesis' (1990) 6 *Journal of Law, Economics, & Organization* 167; Viscusi WK, Vernon JM and Harrington JE, *Economics of Regulation and Antitrust* (3rd ed. edn, MIT Press 2000); Aranson PH, 'Theories of Economic Regulation: From Clarity to Confusion' (1989) 6 *The Journal of Law & Politics* 247.

¹²⁸ Hantke-Domas M, 'The Public Interest Theory of Regulation: Non-Existence or Misinterpretation?' (2003) 15 *European Journal of Law and Economics* 165; Landis JM, 'The Administrative Process' (1939) 3 *Science and Society* 550; *Supra* note 85 in Morgan B and Yeung K at 18.

Compared to the welfare economics, the political approaches of the public interest theories of regulation portray a more dialectic and collective process and action against market failure. See Sunstein CR, *After the Rights Revolution: Reconceiving The Regulatory State* (Harvard University Press 1993); *Supra* note 85 in Morgan B and Yeung K.

consequences of the given regulation, while the latter examines what ought to motivate regulators and which regulatory model could have been more efficient.¹²⁹ However, subsequent theories have emerged that combine both normative and positive analysis. The so-called 'Normative Turned Positive' theory uses normative analysis (market failure) to produce positive explanations (regulatory rationales).¹³⁰

Proponents of the public interest theory perceive the regulatory process as a device to achieve publicly desired results and serve the public at large as well as maximise social welfare by making the following assumptions: adequate information, competitive markets, and lack of externalities.¹³¹ Baldwin and Cave illustrate the assumptions of the theory:

[t]he 'public interest' world is a world in which bureaucracies do not protect or expand their turf, in which politicians do not seek to enhance their electoral or other career prospects, in which decision-making rules do not determine decisions, and a world in which business and other interest groups do not seek special exemptions or privileges.¹³²

¹²⁹ Supra note 127 Levine ME and Forrence JL at 168; Hertog Jd, 'General Theories of Regulation' in Bouckaert B and Geest Gd (eds), *Encyclopedia of Law and Economics*, vol 1 (E. Elgar Pub 2000) 224.

¹³⁰ Becker GS, 'A Theory of Competition Among Pressure Groups for Political Influence' (1983) 98 *The Quarterly Journal of Economics* 371, 384; Kay J and Vickers J, 'Regulatory reform in Britain' (1988) 3 *Economic Policy* 285; Peltzman S, Levine ME and Noll RG, 'The Economic Theory of Regulation after a Decade of Deregulation' (1989) 1989 *Brookings Papers on Economic Activity Microeconomics* 1, 17; Majone G and others, *Regulating Europe* (Routledge 1996) 34; Viscusi WK, Vernon JM and Harrington JE, *Economics of Regulation and Antitrust* (3rd ed. edn, MIT Press 2000); Hertog Jd, 'Economic theories of regulation' *Encyclopedia of Law and Economics*, vol 9 (Encyclopedia of Law and Economics, Edward Elgar 2012)

¹³¹ Ibid Becker; Cox JWR, 'The Appeal to the Public Interest' (1973) 3 *British Journal of Political Science* 229-41.

¹³² Supra note 91 in Baldwin R, Cave M and Lodge M at 41.

These theoretical assumptions, based on the Coase Theorem and Pareto efficient outcome,¹³³ presuppose that while economic actors strive for the public interest, well-organised private actors' interests can supersede public interest, leading to market failure, such as imperfect competition, unstable markets, or undesirable market results.¹³⁴ In this event, regulatory intervention is a necessary response to market failure.¹³⁵

The justification for regulatory intervention here is based on the rationale that “[...] the uncontrolled marketplace will, for some reason, fail to produce behaviour or results in accordance with the public interest.”¹³⁶ Therefore, when markets are prevented from operating effectively and in the public interest, regulatory intervention is prima facie justified to correct inefficiencies and imperfect competition (known as Pareto inferior outcomes).¹³⁷ The theory further asserts that intervention is required as markets are prone to fail and that the transaction cost of regulatory

¹³³ Coase RH, 'The Problem of Social Cost' (1960) 3 *The Journal of Law & Economics* 1; Noll RG, 'Chapter 22 Economic Perspectives on the Politics of Regulation' *Handbook of Industrial Organization, vol 2* (Handbook of Industrial Organization, Elsevier 1989).

¹³⁴ Hertog provides a definition of market failure: “A market failure is a situation where scarce resources are not put to their highest valued uses. In a market setting, these values are reflected in the prices of goods and services. A market failure thus implies a discrepancy between the price or value of an additional unit of a particular good or service and its marginal cost or resource cost.” See supra note 130 in Hertog Jd at 29.

¹³⁵ Bator FM, 'The Anatomy of Market Failure' (1958) 72 *The Quarterly Journal of Economics* 351.

¹³⁶ Supra note 91 in Baldwin R, Cave M and Lodge M at 15; J. Francis, *The Politics of Regulation* (Oxford, 1993), ch 1.

¹³⁷ This rationale belongs to the Normative Turned Positive (NTS) theory of regulation. For Pareto efficiency see Musgrave RA and Musgrave PB, *Public Finance in Theory and Practice* (International student edn, McGraw-Hill Kogakusha 1973) 60.

Ogus posits that “ ‘market failure’ and ‘private law failure’ have to be compared with ‘regulatory failure’” adjuring regulatory intervention to restore the public interest. See supra note 5 in Ogus AI at 30; Arrow, K. J., ‘The Organization of Economic Activity: Issues Pertinent to the Choice of Market Versus Nonmarket Allocation’ in Haveman RH, *Public Expenditure and Policy Analysis* (Markham 1971) 67-81; Arrow KJ, ‘The Potentials and Limits of the Market in Resource Allocation’, in G.R. Feiwel (ed.), *Issues in Contemporary Microeconomics and Welfare* (The Macmillan Press 198) 107-124; Baumol WJ, 'Welfare Economics and the Theory of the State' in Rowley CK and Schneider F (eds), *The Encyclopedia of Public Choice* (Springer US 2004).

intervention is zero, i.e. regulators have the appropriate incentives and accurate information.¹³⁸

There are four key types of a market failure: market power/monopolies, externalities, public goods, and information asymmetries. These are briefly analysed in turn.

First, market power, generated by monopolistic or oligopolistic practices or cartel, raises costs and drives the market to stagnation.¹³⁹ Monopolistic rents result in the loss of consumers' surplus, deterrence to innovation, high production costs, and waste of resources to sustain monopoly rents. An entity in a monopolistic position aims for the maximisation of profits by restricting output and charging prices above marginal cost.¹⁴⁰ Regulatory intervention is required to identify the concentration of market power and abuse of such power, to correct market failure and competition problems, and to restore equilibrium.

Second, externalities are the inefficient allocation of resources ("spillover") for activities that affect others either positively or negatively generating benefits or costs, respectively, without any compensation.¹⁴¹ Vatn and Bromley posit that "[...]

¹³⁸ Supra note 127 Posner RA; Keech WR, Munger MC and Simon C, 'Market Failure and Government Failure' (Public Choice World Congress, Miami, 2012)

¹³⁹ Veljanovski C, 'Economic Approaches to Regulation' in Cave M, Baldwin R and Lodge M, *The Oxford Handbook of Regulation* (1st edn, Oxford University Press 2012) 20-21; Supra note 129 in Hertog Jd at 224;

¹⁴⁰ Supra note 91 in Baldwin R, Cave M and Lodge M at 16.

¹⁴¹ Meade JE, *The Theory of Economic Externalities : The Control of Environmental Pollution and Similar Social Costs* (Sijthoff Institut Universitaire de Hautes Etudes Internationales 1973); Coase RH, 'The Problem of Social Cost' (1960) 3 *The Journal of Law & Economics* 1-44; Dahlman CJ, 'The Problem of Externality' (1979) 22 *The Journal of Law & Economics* 141; Cowen T, *Public Goods and Market Failures : A Critical Examination* (Transaction Publishers 1992); Laffont J-J, *Fundamentals of Public Economics* (MIT Press 1987) 6; Supra note 85 in Morgan B and Yeung K at 21; James O, 'Regulation Inside Government: Public Interest Justifications and Regulatory Failures' (2000) 78 *Public Administration* 327; Veljanovski CG, 'The Coase Theorems and the Economic Theory of Markets and Law' (1982) 35 *Kyklos* 53.

externalities are basically novelties. They will mostly be recognized after they have been produced.”¹⁴² A typical example of negative externalities is the industrial pollution of a neighbouring land where the cost should be internalised either through private law or regulation. Such externalities give rise to misallocation of resources and transaction costs, and, thus, are Pareto-irrelevant.¹⁴³ To correct this form of market failure, control or deterrence mechanisms could be employed through regulation where the degree of seriousness of externalities defines the level of intervention.¹⁴⁴

Third, a public good or collective good is defined as the non-rivalrous consumption, namely the consumption by one individual that does not amount to the reduction and exclusion of the good for the others, and non-excludable.¹⁴⁵ Ogus explains that “a public good is a commodity the benefit from which is shared by the public as a whole, or by some group within it.”¹⁴⁶ Common examples of public goods are education, roads, national defence, and research and development. A key problem here is that of the ‘free-rider’ as consumers “will be tempted to free ride on the willingness to pay of others since they can no longer be excluded from consumption

¹⁴² Vatn A and Bromley DW, 'Externalities — A Market Model Failure' (1997) 9 *Environmental and Resource Economics* 135, 137.

¹⁴³ *Supra* note 5 in Ogus AI at 123; Coase RH, 'The Problem of Social Cost' (1960) 3 *The Journal of Law & Economics* 1.

¹⁴⁴ *Ibid* Ogus AI at 190.

¹⁴⁵ Robert Cooter and Thomas Ulen, *Law and Economics*, (3rd edn, Reading, MA: Addison-Wesley Longman, 2000) 42; Cornes R and Sandler T, *The Theory of Externalities: Public Goods, and Club Goods* (Cambridge: Cambridge University Press, 1986), 3. See also *supra* note 85 in Morgan B and Yeung K at 20; *Supra* note 1230 in Hertog Jd at 43.

¹⁴⁶ *Supra* note 5 in Ogus AI at 33.

of the good.”¹⁴⁷ In the event of a market failure, the regulator may impose payment for these goods such as taxes to ensure optimum quantity.

Last, in traditional economic analysis, information asymmetries¹⁴⁸ hinder the process of making utility-maximizing choices. This is based on two assumptions: first, inadequate information leading to choices that are contrary to one party’s interests (adverse selection); and second, insufficient processing and misappropriation of the information.¹⁴⁹ Such an information deficit is usually noticed in the principal-agent relationship in which principal’s control is limited regarding agent’s actions,¹⁵⁰ as will be examined in depth later.¹⁵¹

Any inefficient outcome resulting from the above comprise market failure.¹⁵² Thus, a regulatory intervention *prima facie* would be deemed necessary to remedy that failure and restore deadweight loss.¹⁵³ Importantly, Morgan and Yeung submit that “[c]orrection of market failures increases the community’s general welfare and is thus in the public interest. Correlatively, those who press for regulation in response to market failures are agents of the public interest.”¹⁵⁴ However, opponents

¹⁴⁷ Den Hertog J, ‘Review of Economic Theories of Regulation’, (2010) 1, 16 available at <https://www.uu.nl/en/files/rebousedp201010-18pdf> accessed on 1 September 2019.

¹⁴⁸ Information asymmetries can broadly be defined as “[d]ifferences among individuals in their information, especially when this information is relevant to determining an efficient plan or to evaluating individual performance.” Milgrom P and Roberts J, *Economics, Organization and Management* (International edn, Prentice-Hall 1992) 600.

¹⁴⁹ Supra note 5 in Ogus AI at 38.

¹⁵⁰ Supra note 91 in Baldwin R, Cave M and Lodge M at 54.

¹⁵¹ An analysis on information asymmetries is further discussed in 4.3.

¹⁵² Supra note 91 in Baldwin R, Cave M and Lodge M at 15-16.

¹⁵³ Kleiman M and Teles S, ‘Market and Non-Market Failures’ in Goodin R and others (eds), *The Oxford Handbook of Public Policy* (Oxford University Press 2008) 627; Posner R, ‘Theories of Economic Regulation’ (1974) 5 *Bell Journal of Economics* 335.

¹⁵⁴ Supra note 85 in Morgan B and Yeung K at 18.

question the practicability of this theory to provide a positive (practical) analysis describing the consequences of regulation leading to market failure.

In contrast to the public interest theories, the private interest theories are premised on the assumption that private actors influence governments/regulators to serve their own interests. In other words, the activities of private actors either as individuals or groups are guided by the maximisation of self-interest.¹⁵⁵ These theories stress the occurrence of regulatory capture that dominates such scholars' analyses. It is necessary, therefore, to clarify exactly what is meant by regulatory capture. Yet, widely varying definitions have emerged in the scholarship.¹⁵⁶ It has been broadly used to describe that the regulatory process is influenced or controlled by special interests.¹⁵⁷ In contrast, a narrower interpretation accounts for the process where regulators, in lieu of public interest, serve the narrow interests of regulatees

¹⁵⁵ These theories are linked to the Chicago and Virginia Schools of Regulation, the latter followed a socio-economic account, the so-called 'public choice' paradigm. The capture thesis originates from the fields of political science and public administration. *Supra* note 85 in Morgan B and Yeung K at 43; S. Peltzman, 'Towards a More General Theory of Regulation' (1976) 19 *Journal of Law and Economics* 211.

¹⁵⁶ By way of example, Gormley defined capture when "regulatory agencies [are] captives of the industries they are supposed to regulate". Makkai and Braithwaite suggested that capture is a form of leniency of the regulator in enforcement or when the regulator is sympathetic of the agency's problem. Other variations are based on the premise that regulatees control regulators or take advantage of economic regulation. See Gormley WT, 'Alternative Models of the Regulatory Process: Public Utility Regulation in the States' (1982) 35 *Western Political Quarterly* 297; Makkai T and Braithwaite J, 'In and Out of the Revolving Door: Making Sense of Regulatory Capture' (1992) 12 *Journal of Public Policy* 61; Berry WD, 'An Alternative to the Capture Theory of Regulation: The Case of State Public Utility Commissions' (1984) 28 *American Journal of Political Science* 524.

¹⁵⁷ According to Mitnick a basic definition of capture is: "that it refers to cases in which a regulated industry is able to control decisions made about that industry by regulators and/or performances by regulators related to the industry. In other words, the industry "captures" regulatory decision making and/or performance so that what regulators decide and/or perform is what industry prefers they decide and/or perform." Mitnick BM, 'Capturing "capture": Definition and Mechanisms' in Levi-Faur D (ed), *Handbook on the Politics of Regulation* (Edward Elgar 2011).

who inefficiently acquire monopoly rents.¹⁵⁸ Despite the various definitions, this study will adopt a more recent definition suggested by Carpenter and Moss who posit regulatory capture as:

[...] the result or process by which regulation, in law or application, is consistently or repeatedly directed away from the public interest and toward the interests of the regulated industry, by the intent and action of the industry itself.¹⁵⁹

This is a robust definition. It might be said to encapsulate regulatory capture in its entirety and to illustrate the implications of capture on the regulatory process. What is useful about this definition is that it stresses the element of “intent” of the industry and accommodates both notions of capture, the legislative and administrative capture. As shown in the following chapters, these two elements are instilled in the establishment of capture in standard setting.

Many variables have been expounded on capture theories over the years, but one of the most important and seminal accounts is Bernstein’s ‘Life Cycle’ theory of regulation that draws a parallel between the human evolution and the generation

¹⁵⁸ Stigler, who was the father of the capture theory, advocated that: ‘[...]as a rule, regulation is acquired by the industry and is designed and operated primarily for its benefit’. Stigler GJ, ‘The Theory of Economic Regulation’ (1971) 2 *The Bell Journal of Economics and Management Science* 3; Dal Bó E, ‘Regulatory Capture: A Review’ (2006) 22 *Oxford Review of Economic Policy* 203; Morgan B and Yeung K, *An Introduction to Law and Regulation: Text and Materials* (Cambridge University Press 2007) 43.

A two-fold assumption is that all the involved parties in the regulatory process are well informed; and regulation is costless. See S. Peltzman, ‘Towards a More General Theory of Regulation’ (1976) 19 *Journal of Law and Economics* 211; *Supra* note 91 in Baldwin R, Cave M and Lodge M at 43.

The regulatory capture theories were initially inspired by the need of state intervention in natural monopolies, but later other monopolistic practices, e.g. price-fixing and entry control, have been taken into consideration. Dal Bó E, ‘Regulatory Capture: A Review’ (2006) 22 *Oxford Review of Economic Policy* 203.

¹⁵⁹ Carpenter D and Moss DA, *Preventing Regulatory Capture: Special Interest Influence and how to Limit it* (Cambridge University Press 2013) 13.

of regulatory capture.¹⁶⁰ In light of the ‘Life Cycle’ theory, there are three phases whereby a regulatory agency undergoes capture. First, is in the ‘gestation phase’ wherein time is required for the production of a regulatory statute, which Bernstein describes it as “[...] a period of slowly mounting distress over a problem.”¹⁶¹ During that unsettled period regulators attempt to set out policy and regulatory goals. Second is the ‘youth phase’ that the regulatory agency enters and in which it tries to formulate the regulatory programme in a supportive public environment with an “aggressive, crusading spirit”.¹⁶² Here, private groups/regulatees initiate their embroilment tactics with the regulatory agency, e.g., litigation; appointment of people from the regulated groups in key agency positions that would act in the interest of the regulated groups. Then, the regulatory agency enters the ‘mature phase’ or the ageing era.¹⁶³ In this last phase, the agency is devitalised and apparently surrendered to the regulated groups, becoming part of the status quo.¹⁶⁴ This model places an emphasis on the “natural” deterioration of the regulatory process that ultimately becomes so flaccid as to result in deregulation.

Bernstein’s model was conceptualised nearly a century ago and the political and regulatory landscape has changed dramatically with the introduction of deregulation, re-regulation, and other neo-liberal paradigms. It remains, however, a useful tool in evaluating today’s regulatory regimes and their potential for capture. In

¹⁶⁰ Bernstein MH, *Regulating Business by Independent Commission* (Princeton University Press Princeton 1955).

¹⁶¹ *ibid* 74.

¹⁶² *ibid* 79-80.

¹⁶³ *ibid* 87-88.

¹⁶⁴ *ibid* 90.

this regard, it has been posited that the more recent regulatory regimes are not as susceptible to capture as previously.¹⁶⁵ A possible explanation for this is that regulatory reformations may have safeguarded the regulatory process from being fully captured.¹⁶⁶ The aim of the regulated firms, according to Posner, is to weaken regulation rather than fully capture it.¹⁶⁷ Also, new forms of capture have emerged in the context of the cycle of neo-liberal paradigms, such as the so-called ‘corrosive capture’.¹⁶⁸ Yet, the perceived reduction in regulatory capture may also be attributable to the substantial difficulties in demarcating the existence, breadth, and degree of regulatory capture, for which there is consensus in the literature. Despite this, Carpenter has built a tripartite model for diagnosing capture if the following conditions are met:

- i. to posit a defensible model of public interest,
- ii. to show action and intent by the regulated industry, and
- iii. to demonstrate that ultimate policy is shifted away from the public interest and toward industry interest.¹⁶⁹

This model pins down three essential elements that incorporate, to an extent, Bernstein’s ‘Life Cycle’ theoretical premise.

¹⁶⁵ Posner RA, ‘The Concept of Regulatory Capture: A Short, Inglorious History,’ in Carpenter D and Moss DA, *Preventing Regulatory Capture: Special Interest Influence and how to Limit it* (Cambridge University Press 2013) 54. See also 5.3 for an analysis of the concept of ‘medium capture’.

¹⁶⁶ Ibid.

¹⁶⁷ Posner highlights that capture has become a static term of analysis and: “[...] the term regulatory capture should be retired”. Ibid 54-56.

¹⁶⁸ The term ‘corrosive capture’ refers to the reduction of regulatory requirements and weaker regulation as a result of capture. Carpenter D, ‘Corrosive Capture? The Dueling Forces of Autonomy and Industry Influence in FDA Pharmaceutical Regulation’ in Carpenter D and Moss DA (eds), *Preventing Regulatory Capture: Special Interest Influence and How to Limit it* (Cambridge University Press 2013) 152.

¹⁶⁹ Carpenter D, ‘Detecting and Measuring Capture’ in Carpenter D and Moss DA, *Preventing Regulatory Capture: Special Interest Influence and How to Limit it* (Cambridge University Press 2013) 63.

Both, public and private interest, regulatory theories have a long history and have evolved since their conception with a strong debate in scholarship about the incompleteness and flaws of both branches of the regulatory theories. Although the public and the private interest theories employ different assumptions and tools to correct malfunctions in the regulatory process, it is appropriate to claim that they corroborate one another and justify regulatory intervention when capture or market failure is detected.¹⁷⁰

The aim of this section was not only to penetrate the main two strands of regulatory theories (public and private theories) and the related concepts but also to discern the linkage between the agency theory and capture. These regulatory tools will be extrapolated and applied in certain parts of this study. Specifically, based on Carpenter and Moss definition of capture, this study will utilise Carpenter's tripartite capture model in standard setting which will be further discussed in Chapter 4. In addition, in Chapter 5, the study will resort to market failure rationales of public interest theories to justify regulatory intervention.

Having discussed the theoretical concept of capture and the distinction between public and private regulatory theory rationales, the next section will focus on the agency problem and agency capture.

¹⁷⁰ Ayers and Braithwaite have combined public and private interest approaches emphasising the institutional dynamics and bridging regulatory actors and systems together. *Supra* note 108 in Ayres I and Braithwaite J.

3.3.3 Agency Problem and Agency Capture

The adoption of private regulation and the delegation of regulatory competencies to agents have ushered in a decentred analysis of regulation by the neo-institutionalist scholars, whose attention has been drawn to the modern policymaking and governance of IRAs/SRAs, signalling a departure from the usual command-and-control analysis of regulation.¹⁷¹ Scholars from different fields, though, have focused on the potential problems inherent to the agency relationship.

As mentioned above, the agency relationship is premised on the delegation of discretionary powers and responsibilities from the principal to the agent. The classic agency paradigm examines that relationship under theories of contract where problems may arise.¹⁷² For example an agency relationship could be in the context of employer and employee, professional and client, manager and shareholder relationships. The underpinning assumption in such contractual relationships is the value creation or in other words utility maximisation of the principal. However, agency problems may arise when the interests of both parties (principal and agent) collide and the agent seeks to maximise its individual utility. Such divergence favours the creation of an agency problem which is based on three key features: information asymmetries, goal conflict, moral hazard/opportunism.¹⁷³

The central notion of the agency problem rests on asymmetrical information as the agent has more information about the tasks that have been appointed to them

¹⁷¹ Scott C, 'Private Regulation of the Public Sector: A Neglected Facet of Contemporary Governance' (2002) 29 *Journal of Law and Society* 56.

¹⁷² Stremitzer A, *Agency Theory: Methodology, Analysis* (Peter Lang AG 2005) 1, 3; Lan LL and Heracleous L, 'Rethinking Agency Theory: The View from Law' (2010) 35 *The Academy of Management Review* 294, 295.

¹⁷³ *Supra* note 124 in Eisenhardt KM at 57.

compared to the principal.¹⁷⁴ Due to this information inequality, the agent could behave opportunistically after the contractual agreement – in the agency literature termed as moral hazard or hidden actions – which could lead the principal to make an adverse selection.¹⁷⁵

This incompatibility of incentives and the misalignment of interests between the principal and agent is termed as ‘goal conflict’.¹⁷⁶ This misalignment could occur either in public or private sectors.¹⁷⁷ Purportedly, the principal is a regulator who serves the public interest and delegates a task to an agent who pursues self-interests. The over-reliance of the principal on the agent’s expertise to accomplish the delegated task could be at the expense of the public interest.¹⁷⁸ When private actors are employed to carry out regulatory activities it is imperative to determine whether their incentives and actions move away from the public interest and towards the interests of the regulated groups. The sociological commentary has, thus, focused on the source of the goal conflict between the principal and the agent to identify whose interests the latter serves.¹⁷⁹ Interestingly, it has been theorised that the agent may serve more than one principals, and, thus, the identification of the source of conflict

¹⁷⁴ Supra note 129 in Majone G and others at 36; Supra note 121 in Jensen MC and Meckling WH.

¹⁷⁵ Supra note 124 Eisenhardt KM at 61; Saam NJ, 'Asymmetry in Information Versus Asymmetry in Power: Implicit Assumptions of Agency Theory?' (2007) 36 *The Journal of Socio-Economics* 825, 827.

¹⁷⁶ Moe TM, 'The New Economics of Organization' (1984) 28 *American Journal of Political Science* 739, 754; Eisenhardt KM, 'Agency Theory: An Assessment and Review' (1989) 14 *The Academy of Management Review* 57, 58; Barney JB and Hesterly W, 'Organizational Economics: Understanding the Relationship between Organizations and Economic Analysis' in Glegg SR and others (eds), *Handbook of Organization Studies* (2 edn, SAGE Publications Ltd 2006) 1, 125; Waterman RW and Meier KJ, 'Principal-Agent Models: An Expansion?' (1998) 8 *Journal of Public Administration Research and Theory* 173, 177.

¹⁷⁷ Hughes OE and Dawsonera, *Public Management and Administration: An Introduction* (3rd edn, Palgrave Macmillan 2003) 1,12.

¹⁷⁸ Supra note 121 in Jensen MC and Meckling WH.

¹⁷⁹ Shapiro SP, 'Agency Theory' (2005) 31 *Annual Review of Sociology* 263, 278.

becomes completely relevant when fashioning complex disincentives that may lead to the misconduct of the agent.¹⁸⁰ This theory could be particularly useful to analyse the incentives when more than one principals or agents partakes in the policy-making process.

The principal, further, may encounter problems in observing or controlling the activities of an agent due to information asymmetries. This is a post-contractual problem termed as 'moral hazard' in the agency theory. In this instance, again, the principal is unable to establish whether the agent's activities are counter to the principal's goals.¹⁸¹ There are two sub-categories of moral hazard: hidden action and hidden information. The former is related to the activities of the agent whereas the latter to the obtained private information that the agent withholds from the principal.¹⁸² Hidden actions and information may be conjoined or the one may subsume the other.¹⁸³ A useful example of this dyad is the concealing of performance information from the principal or sharing fabricated information.¹⁸⁴

¹⁸⁰ Ibid.

¹⁸¹ Barney JB and Hesterly W, 'Organizational Economics: Understanding the Relationship between Organizations and Economic Analysis' in Glegg SR and others (eds), *Handbook of Organization Studies* (2 edn, SAGE Publications Ltd 2006) 1, 440; Milgrom P and Roberts J, *Economics, organization and management* (International edn, Prentice-Hall 1992) 1, 167; Petersen T, 'The Economics of Organization: The Principal-Agent Relationship' (1993) 36 *Acta Sociologica* 277, 281 and 284.

¹⁸² Hart O and Holmström B, 'The Theory of Contracts' in Bewley TF (ed) *Advances in Economic Theory: Fifth World Congress* (Cambridge University Press 1987) 71, 76; Arrow K, 'The Economics of Agency' (1985) John IV Pratt und Richard J Zeckhauser, *Principals and Agents The Structure of Business*, Boston 37;

¹⁸³ Ibid Hart O and Holmström B, 'The theory of contracts' 71.

¹⁸⁴ Bergen M, Dutta S and Walker OC, 'Agency Relationships in Marketing: A Review of the Implications and Applications of Agency and Related Theories' (1992) 56 *Journal of Marketing* 1, 3; Milgrom P and Roberts J, *Economics, Organization and Management* (International edn, Prentice-Hall 1992) 167.

Within the context of the agency relationship, public administration scholars have been occupied with the concept of accountability, characterised as the “life-blood in guarding public interest”,¹⁸⁵ and the misaligned interests of the principals and agents.¹⁸⁶ In most cases, regulatory agencies are independent by design so that they are free from political influence enjoying some discretion and decision-making authority.¹⁸⁷ As a result, agencies bear a lesser accountability compared to governments and elected officials and are free to allocate their resources autonomously.¹⁸⁸

At the core of public administration analyses, though, is the problem of accountability fuelled by the prevalence of public-private partnerships over the last few decades. The increasing number of European independent agencies possessing expansive executive powers, such as decision-making and quasi-regulatory powers, has given rise to concerns regarding the existence of ‘accountability deficit’¹⁸⁹ on the

¹⁸⁵ Hodge G, 'Governing the Privatised State: New Accountability Guardians' (Accountable Governance: An International Research Colloquium', Queen's University, Belfast, 20–22 October 2005).

¹⁸⁶ Potter MR, Olejarski AM and Pfister SM, 'Capture Theory and the Public Interest: Balancing Competing Values to Ensure Regulatory Effectiveness' (2014) 37 *International Journal of Public Administration* 638.

¹⁸⁷ Gilardi F, 'Principal-Agent Models Go to Europe: Independent Regulatory Agencies as Ultimate Step of Delegation' (ECPR General Conference, Canterbury (UK)) 1, 9; Scholten M, 'Independence vs. Accountability: Proving the Negative Correlation' (2014) 21 *Maastricht Journal of European and Comparative Law* 197, 199; Vos E, 'Independence, Accountability and Transparency of European Regulatory Agencies' in Geradin D and others (eds), *Regulation through Agencies in the EU: A New Paradigm of European Governance* (Edward Elgar 2005) 123; Scholten M, 'Independent, hence unaccountable?' (2011) 4 *Review of European Administrative Law* 5, 8-10; Majone G, 'The Credibility Crisis of Community Regulation' (2000) 38 *JCMS: Journal of Common Market Studies* 273, 302.

¹⁸⁸ *Ibid* Gilardi F.

¹⁸⁹ Dehousse R, 'Delegation of Powers in the European Union: the Need for a Multi-Principals Model' (2008) 31 *West European Politics* 789; Curtin D, Curtin D, 'Delegation to EU Non-Majoritarian Agencies and Emerging Practices of Public Accountability' in Geradin D and others (eds), *Regulation through Agencies in the EU: A New Paradigm of European Governance* (Edward Elgar 2005) 87.

part of such agencies transforming them into ‘uncontrollable centres of arbitrary power’.¹⁹⁰

In public administration, accountability is strongly linked with the notion of democratic governance.¹⁹¹ Yet, depending on the context of analysis, accountability received different interpretations and meanings. Within the framework of the agency theory, Brandsma and Adriaensen elaborated a narrower definition stressing that accountability is a mechanism that “includes the transfer of information from the agent to the principal, the possibility for the principal to ask further questions, to pass judgment and to impose positive or negative consequences on the agent.”¹⁹²

This definition prominently encapsulates the gist of the agency theory suggesting that information is vital in the agency relationship. A premise that refers back to the

¹⁹⁰ Everson M, 'Independent Agencies: Hierarchy Beaters?' (1995) 1 *European Law Journal* 180, 190. This has been also supported by the AG's opinion in *UK v Parliament and Council* stating that: “The Commission has characterised a ‘European Regulatory Agency’ as ‘an independent legal entity created by the legislator in order to help regulate a particular sector at European level and help implement a particular Community policy’. There are currently over thirty decentralised agencies operative in the European Union, or in the making, several of them with binding decisions making authority. As is well known, ‘agencification’ in the European Union is a process that has intensified significantly since the new millennium. As one commentary observes, the challenge now, and has always been, is to balance the functional benefits and independence of agencies against the possibility of them becoming ‘uncontrollable centres of arbitrary power’.” See Case C-270/12 *United Kingdom of Great Britain and Northern Ireland v European Parliament and Council of the European Union* [2013] ECLI:EU:C:2013:562 para 19.

¹⁹¹ Accountability can be defined as follows: “(1) is a social relationship between at least two parties (2) in which the demand or obligation for account-giving is accepted and expected by both parties. Account-giving is, therefore, “after the fact” of an accountable matter. Accountability in modern terms also (3) includes organizational and/or political mechanisms designed to “bring” or “cause” individuals or agencies to account “before the fact” by causing them to act accountably.” Dubnick MJ and Frederickson HG, 'Accountable Agents: Federal Performance Measurement and Third-Party Government' (2010) 20 *Journal of Public Administration Research and Theory* i143, i144.

¹⁹² Brandsma GJ and Adriaensen J, 'The Principal-Agent Model, Accountability and Democratic Legitimacy' in Delreux T and Adriaensen J (eds), *The Principal Agent Model and the European Union* (Springer International Publishing 2017) 42; Bovens M, 'Analysing and Assessing Accountability: A Conceptual Framework1' (2007) 13 *European Law Journal* 447, 450.

basic concepts of information asymmetries and moral hazard. Hidden information could lead to the original paradigm of the agency problem, namely moral hazard.

The agency theory literature has posited hypotheses to address accountability problems in the delivery of public choice by agents. This is an important facet since accountability “conveys an image of transparency and trustworthiness.”¹⁹³ Against this backdrop, the principal-agent model examines assumptions to unpack ‘agency drifting’, namely agent’s practices to eschew accountability when they serve their own interests, and to correct not only agency but also accountability problems.¹⁹⁴ Agent’s noncompliance post-delegation can generate agency costs, frequently termed as ‘agency loss’.¹⁹⁵ Kiewiet and McCubbins summarise this problem: “Delegation [...] entails side effects that are known, in the parlance of economic theory, as agency losses. There is almost always some conflict between the interests of those who delegate authority (principals) and the agents to whom they delegate it. Agents behave opportunistically, pursuing their own interests subject only to the constraints imposed by their relationship with the principal.”¹⁹⁶ Agency loss can appear in the

¹⁹³ Ibid Bovens M, 448.

¹⁹⁴ Schillemans T and Busuioc M, 'Predicting Public Sector Accountability: From Agency Drift to Forum Drift' (2015) 25 *Journal of Public Administration Research and Theory* 191.

¹⁹⁵ Lupia defines agency loss as: “[...] the difference between the consequences of delegation for the principal and the best possible consequence. Agency loss is zero when the agent takes actions that are entirely consistent with the principal’s interests. As the agent’s actions diverge from the principal’s interests, agency loss increases. When the agent does things that are bad for the principal, agency loss is high.” See Lupia A, 'Delegation of Power: Agency Theory' in Smelser NJ and Baltes B (eds), *International Encyclopedia of the Social and Behavioral Sciences* (International Encyclopedia of the Social and Behavioral Sciences, 2001).

¹⁹⁶ Supra note 125 in Kiewiet DR and McCubbins MD at 5; Strom K, 'Delegation and Accountability in Parliamentary Democracies' (2000) 37 *European Journal of Political Research* 261, 289; *ibid* Lupia A, 3375–7.

form of 'slippage' or 'shirking'.¹⁹⁷ Slippage occurs from the flaws found in the institutional structure of the delegation that enable the agent to act against the wishes of the principal.¹⁹⁸ Shirking, on the other hand, arises when the agent pursues its own preferences diverging from those of its principal.¹⁹⁹ Thatcher points out that "[s]hirking and slippage imply some sort of noncompliance by the agent such that the agent is no longer following the goals of the principal."²⁰⁰ To mitigate such problems, the principal can introduce control mechanisms in the structure of the principal-agent relationship.²⁰¹

Turning to the agency capture, moral hazard essentially refers to the ex post opportunism of the agent after the establishment of the agency relationship. As discussed previously, the elements of ex post opportunism and the divergence of interests comprise the regulatory capture or, within the framework of the agency relationship, agency capture. Although agency capture has also been viewed as an elusive and somewhat difficult to ringfence concept, various scholars have described it as the over-reliance of the agent on an interest group that captures agency decision

¹⁹⁷ Coen D and Thatcher M, 'The New Governance of Markets and Non-Majoritarian Regulators' (2005) 18 *Governance* 329, 333; Thatcher M and Stone Sweet A, *The Politics of Delegation* (Frank Cass 2003) 116; supra note 170 Shapiro SP at 272; Lazear EP and Rosen S, 'Rank-Order Tournaments as Optimum Labor Contracts' (1981) 89 *Journal of Political Economy* 841; supra note 80 in Epstein D and O'Halloran S at 39; Holmstrom B, 'Moral Hazard in Teams' (1982) 13 *The Bell Journal of Economics* 324; Pollack MA, 'Delegation, Agency, and Agenda Setting in the European Union', *The Engines of European Integration* (Oxford University Press 2003) 64.

¹⁹⁸ Egan M, 'Regulatory Strategies, Delegation and European Market Integration' (1998) 5 *Journal of European Public Policy* 485, 489.

¹⁹⁹ *Ibid.*

²⁰⁰ Supra note 197 in Thatcher M and Stone Sweet A at 47.

²⁰¹ Moe TM, 'The New Economics of Organization' (1984) 28 *American Journal of Political Science* 739, 777; supra note 80 in McCubbins MD, 'The Legislative Design of Regulatory Structure', 748.

making.²⁰² The problem of agency capture is noted to materialise when there is incentive and/or interest incompatibility, namely the agent engages in opportunistic behaviour that runs counter to the interests of the principal.²⁰³ An agency may be captured in various ways, but two forms are most common: externally by stakeholders outside agency's domain, i.e. inter-agency capture; or internally by its own members, i.e. intra-agency capture.²⁰⁴ It has been further noted that the lack of sufficient regulation can increase significantly the risk of capture which could take shape during the policymaking process.²⁰⁵

It can be concluded from the above that most theorists have addressed the agency problem in the context of settings wherein private actors pursue narrower interests colliding with the principal's interests. In such cases the three factors that contribute to the agency problem are information asymmetries, goal conflict, and moral hazard. More specifically, the concept of moral hazard is connected with the

²⁰² Bagley provided a definition of agency capture as: "[...] shorthand for the phenomenon whereby regulated entities wield their superior organizational capacities to secure favorable agency outcomes at the expense of the diffuse public." Bagley N, 'Agency Hygiene' (2010) 89 *Texas Law Review* 1, 2; Wilson JQ, *The Politics of Regulation* (Basic Books 1980); Bernstein MH, *Regulating Business by Independent Commission* (Princeton University Press Princeton 1955) 92; supra note 158 in Stigler GJ; supra note 127 in Posner RA; Peltzman S, 'Toward a More General Theory of Regulation' (1976) 19 *The Journal of Law and Economics* 211; Barkow RE, 'Insulating Agencies: Avoiding Capture through Institutional Design' (2010) 89 *Texas Law Review* 15.

²⁰³ Supra note 125 in Kiewiet DR and McCubbins MD, *The Logic Of Delegation: Congressional Parties and the Appropriations Process* (University of Chicago Press 1991) 1, 5.

²⁰⁴ Colquitt JA, 'Rethinking Judicial Nominating Commissions: Independence, Accountability, and Public Support' (2007) 34 *Fordham Urban Law Journal* 73, 87; Sherman LW, 'Three Models of Organizational Corruption in Agencies of Social Control' (2014) 27 *Social Problems* 478; Bull RT, 'Combating External and Internal Regulatory Capture: The Regulatory Review' (2016) available at <https://www.theregreview.org/2016/06/20/bull-combating-external-internal-regulatory-capture/> accessed on 1 September 2019.

²⁰⁵ As Yackee points out: "[y]et, if capture exists, then one might expect to see it manifest during the rulemaking process" referencing West. See Yackee SW, 'Reconsidering Agency Capture During Regulatory Policymaking' in Carpenter D and Moss DA (eds), *Preventing Regulatory Capture: Special Interest Influence and How to Limit it* (Cambridge University Press 2013); West W, 'Administrative Rulemaking: An Old and Emerging Literature' (2005) 65 *Public Administration Review* 655.

concept of capture as opportunism is embodied in both concepts. Based on the scholarship of the agency theory moral hazard is occurred because agents escape oversight and engage in opportunistic behaviour due to an intrinsic difficulty of the principal to observe every action of the agent.²⁰⁶

This section explored the regulatory models of better regulation, co- and self-regulation applicable to standard setting. It demonstrated that co-regulation in standard setting, i.e. the co-operation between the Commission and ETSI, forms a principal – agent relationship under the agency theory. Since this section has built the theoretical basis of agency problem and agency capture, the next section applies it to the standard setting with the aim to pave the way for the theoretical affirmation of capture in standard setting.

3.4 Application of the Agency Theory to EU ICT Standard Setting

Various studies have applied the agency theory to examine agency capture and to describe and test hypotheses to identify a variety of agency problems or to delineate solutions to these problems. The agency theory has been a valuable device in interpreting interests, incentives and misconduct in collective policymaking. Despite the former application of the agency theory to the policymaking in fields such as energy, financial sector, and corporate governance, it has not been yet tested against the landscape of standard setting.

²⁰⁶ Martimort D, 'The Life Cycle of Regulatory Agencies: Dynamic Capture and Transaction Costs' (1999) 66 *The Review of Economic Studies* 929.

This impediment coincides in the 'abdication hypothesis' which asserts that the abdication of the principal may give leverage to the unrestrictive misconduct of the agent. See supra note 125 in Kiewiet DR and McCubbins MD; McCubbins MD, Noll RG and Weingast BR, 'Administrative Procedures as Instruments of Political Control' (1987) 3 *Journal of Law, Economics, & Organization* 243.

This section introduces and tests hypotheses of the agency theory on the co-regulatory regime of standard setting. Utilising the agency theory as a theoretical framework, this section will examine at large the agency relationship of the co-regulatory model in standard setting in conjunction with the issue of patent holdup. Before embarking on the demonstration of the agency capture and problem in standard setting in Chapter 4, the agency relationship between the Commission and ETSI; the public interest in standard setting; and strategic behaviour must be analysed.

3.4.1 Agency Relationship in Standard Setting

The New Approach paired with the co-regulation in standard setting provided a template for a new mode of governance that is aptly based on the framework of the agency theory. There are various agency relationships in terms of the EU standardisation system. As noted above, there is a chain of agency relationships that is formed between principals and agents. Interestingly, standard setting has a multi-level governance. Specifically, Member States and EU Institutions have a dual role in the standardisation process and are placed at the top of the chain (see Figure 2). At one level, the Member States assign the task to the Commission to ensure competitiveness of the industry, enhancement of innovation, and the functioning of the

Single Market through standards. At another, the Commission proposes and mandates legislation.²⁰⁷ This is a versatile agency relationship where the principals become agents and vice versa.

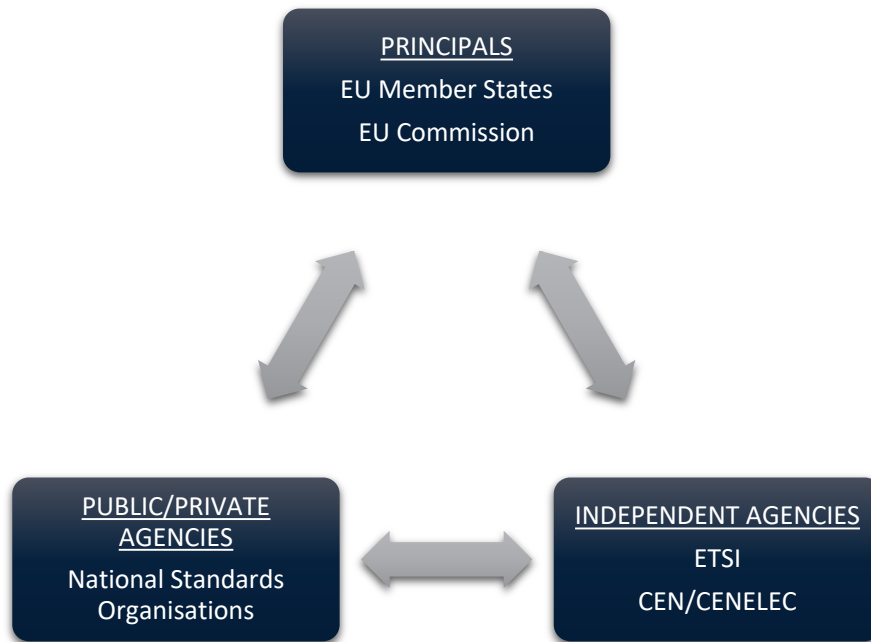


Figure 2, EU Agency Relationship Chain

In addition to that dual and versatile agency relationship, the Commission uses European and National Standard Organisations to streamline the development of harmonised standards through mandates. The Commission's mandates are considered to be an implementing act issued under the procedures of Regulation 182/2011 (Comitology Regulation).²⁰⁸ The relationship between ETSI and the Commission was based on a contractual relationship in the form of General Guidelines

²⁰⁷ Thatcher M, 'The Commission and National Governments as Partners: EC Regulatory Expansion in Telecommunications 1979–2000' (2001) 8 *Journal of European Public Policy* 558, 559.

²⁰⁸ European Regulation No 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by Member

for Cooperation²⁰⁹ that had the following special characteristics: contractual responsibility to draft European Standards to the interests of the Union; and funding by public bodies, particularly the Commission.²¹⁰ However, with Regulation 1025/2012 on European Standardisation this contractual relationship was replaced by a legal one that entails obligations directly imposed on ESOs.²¹¹ Against this backdrop, ETSI is charged with the development of harmonised standards which “form part of the European Union legal system” giving “concrete form on a technical level to the essential requirements” while having legal effects.²¹² The delegation of such discretionary powers to independent agencies, outside the scope of EU Institutions, is within the meaning of Articles 290 and 291 of TFEU where ‘the measures to be adopted are

States of the Commission’s exercise of implementing powers [2011] OJ L 55/13; European Commission, Staff Working Document: Vademecum on European Standardisation in support of Union Legislation and policies PART I Role of the Commission's Standardisation requests to the European standardisation organisations, SWD(2015) 205 final 1, 9; Article 22 of Regulation 1025/2012 of the European Parliament and of the Council on European Standardisation, [2012] OJ L 316/12.

²⁰⁹ General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association (2003) OJ C 91/7, 28 March 2003.

²¹⁰ According to the Opinion of AG Campos Sánchez-Bordonain in *James Elliott*: “[...] harmonised technical standards are based on cooperation with the Commission, governed by an agreement in the form of certain general guidelines, periodically renewed [...] To those ends, certain common principles are laid down, governing the relationship and cooperation between standardisation bodies and the Commission, in accordance with which standardisation bodies undertake to draw up standards in the manner most appropriate to the interests of the Union. In return, the Commission undertakes to support and involve itself in the work of those bodies [...] [and] gives financial support [...] for the drafting of harmonised technical standards.” Case C-613/14, *James Elliott Construction*, paras 57–58.

See also Gnes M, 'Do Administrative Law Principles Apply to European Standardization: Agencification or Privatization?' (2017) *Legal Issues of Economic Integration* 367, 376; Tovo C, 'Judicial Review of Harmonized Standards: Changing the Paradigms of Legality and Legitimacy of Private Rule-making under EU Law' (2018) *Common Market Law Review* 1187, 1198. In general, in order to establish the agency relationship between the Commission and ETSI, three parameters must be met: i. delegation of tasks to the agent; ii. allocation of resources for the completion of these tasks; and iii. interest in monitoring the process for accomplishing the tasks.

²¹¹ *Supra* note 208 Article 10 of Regulation 1025/2012.

²¹² Case C-613/14, *James Elliott Construction* [2016] ECLI:EU:C:2016:821, paras 34–42; The European Commission, ‘General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association — 28 March 2003’ OJ C 91, 16.4.2003.

dependent on specific professional and technical expertise' and the body adopting a measure has the 'ability to respond swiftly and appropriately.'²¹³

ETSI, as an independent regulatory agency, is governed by its own policies and rules (self-regulatory body) that distinguish it from other public authorities and particularly from the Commission.²¹⁴ It is, therefore, a private body that exercises quasi-public powers. ETSI is a not-for profit organisation²¹⁵ and its funds are obtained through: member subscription; the Commission and the European Free Trade Association (EFTA); commercial activities; and contributions from partner organisations.²¹⁶ As per ETSI Annual Report 2019, members' contribution is the main source of revenue reaching roughly the 72% of the budget.²¹⁷ Nevertheless, the grants from Commissions and EFTA amount to almost one-sixth of the total revenue of ETSI.²¹⁸

These figures illustrate that ETSI relies greatly on the involvement of industry participants not only for the production of standards but also for financial sustainability. The aggregation of individual industry participants, which are concomitantly

²¹³ The CJEU ruled that there is an open delegation system that allows the delegation of discretionary powers to agencies justified on the basis that the agency possesses the specific technical and professional expertise. The Court particularly underlined such possibility stating that: "while the treaties do not contain any provision to the effect that powers may be conferred on a Union body, office or agency, a number of provisions in the FEU Treaty none the less presuppose that such a possibility exists." See Case C-270/12, *United Kingdom of Great Britain and Northern Ireland v European Parliament and Council* (ESMA) [2013] ECLI:EU:C:2014:18 para 80; Case C-521/15, *Spain v Council* [2017] EU:C:2017:982 para 43.

²¹⁴ Everson M and others, 'The Role of Specialised Agencies in Decentralising EU Governance: Report Presented to the Commission' (1999) 1, 33.

²¹⁵ ETSI, 'ETSI Directives : ETSI Statutes' Section, Article 1: "In accordance with the French law of 1 July 1901 and the decree of 16 August 1901, an association is founded by the signatories to these Statutes. The Association shall have the title "EUROPEAN TELECOMMUNICATIONS STANDARDS INSTITUTE" and may be known by the acronym "ETSI" and hereinafter referred to as the Institute. The European Telecommunications Standards Institute shall be non-profit making."

²¹⁶ ETSI, 'ETSI Directives : ETSI Statutes' Section, Article 9.

²¹⁷ According to the Report, 41% of the full and associate members are manufacturers. See ETSI, 'Annual Report 2019' (2019) 1, 50-51 and 53 available at <https://www.etsi.org/images/files/AnnualReports/etsi-annual-report-april-2019.pdf> accessed on 1 September 2019.

²¹⁸ Ibid.

members of ETSI, affects the decision making of the standardisation process.²¹⁹

What is more important, though, is the examination of whether the aggregation of individual interests coincides with the overarching purpose of standardisation, namely public interest. The next two sections will examine the public interest character of the standardisation process to postulate the divergence of the SEP holders' narrow interests from the public interest that would justify the existence of agency capture.

3.4.2 Standardisation and Public Interest

Standardisation has been implemented to serve and advance the public interest and public policy objectives while offsetting private interests.²²⁰ Standards facilitate market efficiency and have enormous economic and social impact by improving performance of services and products while lowering transaction costs and promoting intra-industry international trade.²²¹ It is necessary here to clarify how public

²¹⁹ See 4.2.2 for a discussion on the topic of decision making in ETSI and the voting power of its members.

²²⁰ Schoechle TD, *Standardization and Digital Enclosure: The Privatization of Standards, Knowledge, and Policy in the Age of Global Information Technology* (Information Science Reference, 2009); Iversen EJ, Vedel T and Werle R, 'Standardization and the Democratic Design of Information and Communication Technology' (2004) 17 *Knowledge, Technology & Policy* 104.

²²¹ Spulber DF, 'Standard Setting Organisations and Standard Essential Patents: Voting and Markets' (2018) *The Economic Journal* 1, 2; Swann GP, *The Economics of Standardization: An Update* (Report for the UK Department of Business, Innovation and Skills (BIS), 2010) available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/461419/The_Economics_of_Standardization_-_an_update_.pdf accessed on 1 September 2019; Directorate for Financial and Enterprise Affairs Competition Committee of the Organisation for Economic Co-operation and Development (OECD), 'Standard Setting' (2010) 1, 10 available at <http://www.oecd.org/daf/competition/47381304.pdf> accessed on 1 September 2019.

interest is factored into standard setting. The term public interest has a broad meaning and is susceptible to various interpretations.²²² For this study, public interest, as defined in Chapter 1, conforms to the competition law standard of consumer welfare.²²³ The section that follows will delineate the specific characteristics of public interest and its strong link in the standardisation process, arguing that standards encapsulate public interest and materialise its very notion. It is vital, therefore, first to examine the concept of standards then to discern the public interest embedded within it.

Standard is a commonly used term and yet it is one difficult to define precisely and fully. Thus, several definitions have been proposed. A detailed analysis by Busch draws on an extensive range of sources to identify the meaning and emergence of standards.²²⁴ According to Busch, standards are ubiquitous like norms but they differ greatly from them, including the fundamental difference that standards apply to both things and people while norms apply only to the latter.²²⁵ Busch claims that standards:

²²² For example, the term 'public interest' is used by Levine and Forrence to refer to 'public preferences' where individuals or collectives consider the interests of the "others" unlike in the case of purely private interests. In particular: "Public preferences are very different from private preferences. One characteristic of public preferences is that welfare states cannot easily be analyzed in terms of the Pareto principle. For example, it is not the case that one could improve one's welfare with respect to one's public preferences by changing one's own position for the better while leaving those of others alone. One can only improve one's position with respect to one's public preferences by changing the position of others. It also means that, for this sense of public interest, the preferences of others with respect to their positions may or may not be sovereign in determining one's view of their welfare, depending on the specific content of one's public preferences with respect to self-determination." Levine ME and Forrence JL, 'Regulatory Capture, Public Interest, and the Public Agenda: Toward a Synthesis' (1990) 6 *Journal of Law, Economics, & Organization* 167, 175.

²²³ See 1.5.

²²⁴ Busch L, *Standards: Recipes for Reality* (First MIT Press edn, MIT Press 2011).

²²⁵ *Ibid* 23.

may imply that something is the best, or that it may be used as an exemplary measure or weight; or they may emphasize the moral character of someone or the superb qualities of something. Standards may also refer to rules or norms that embody the ideal or merely the average. Finally, standards may refer to tolerances permitted for both people and things. These various meanings are inextricably linked together. All say something about moral, political, economic, and technical authority.²²⁶

By adopting a simplified view, Busch perceives standards as “recipes for reality” but that “[s]ome recipes must be followed extremely carefully if the expected results are to be achieved, while others can be easily modified.”²²⁷ Since standards are subject-matter related and numerous with widespread application across sectors, they need to be classified vis-à-vis their basic function.²²⁸ While a good conceptual starting point, the above definition is too generic to apply here in a context focused not on people but ‘things’ such as information and the compatibility and interoperability standards of the ICT domain. Therefore, a definition that encapsulates a more technical character is needed.

Against this backdrop, for De Vries, a technical standard is an: “approved specification of a limited set of solutions to actual or potential matching problems, prepared for the benefits of the party or parties involved, balancing their needs, and

Busch further asserts that: “Finally, the notion of a standard is (or can be) more precise than that of a norm. Standards can be and usually are measured, tested, examined, revised. Norms, in contrast, are usually amorphous; they are rarely easily definable since they remain, as Durkheim claims, in the realm of the collective conscience. That is to say, for Durkheim norms are ideational phenomena that have material consequences. Standards are at once ideational and material. They span the ideal-material divide, or perhaps obliterate it. Standards are the rules by which we are told we should live, and the range of possibilities presented to us when we make choices. Thus, standards are more than norms. Standards allow us to break away from the concept of norm, which has the unfortunate tendency to mean the average as well as to imply that breaking away from a given standard is necessarily deviant or pathological.” Ibid.

²²⁶ Ibid 25.

²²⁷ Ibid 73.

²²⁸ Tasse G, 'Standardization in Technology-Based Markets' (2000) 29 Research Policy 587.

intended and expected to be used repeatedly or continuously, during a certain period, by a substantial number of the parties for whom they are meant.”²²⁹ Lemley uses standard to refer to “[...] any set of technical specifications that either provides or is intended to provide a common design for a product or process.”²³⁰ This definition is close to that of Jakobs, who defines standard as “a publicly available definitive specification of procedures, rules and requirements, issued by a legitimated and recognized authority through voluntary consensus building observing due process, that establishes the baseline of a common understanding of what a given system or service should offer.”²³¹ This latter definition appears to be more congruous with the formal standardisation of ICT technologies. There is, however, variations that lead to no general agreement on a definition that captures the meaning for technology standards.

Despite the multiple definitions found in the literature, there is a seeming consensus on the meaning of standards provided by the SSOs. For example, based on the official definition of the International Organization for Standardization

²²⁹ De Vries HJ, 'Introduction to Standards and Standardization' in de Vries HJ (ed) *Standardization: A Business Approach to the Role of National Standardization Organizations* (Springer US 1999) 15.

²³⁰ Lemley M, 'Intellectual Property Rights and Standard-Setting Organizations' (2002) 90 *California Law Review* 1889, 1896.

²³¹ Jakobs K, *Advanced Topics in Information Technology Standards and Standardization Research* (Idea Group Pub 2006) 3.

Jakobs further evaluates his definition and provides justifications for its caveats: “This restricts the scope of what is colloquially referred to as a standard in three ways: firstly, it includes only base standards (the ‘baseline’); as opposed to functional standards or profiles, which rather more address implementation and interoperability issues. Secondly, it limits the sources from which a standard may emerge to ‘recognised authorities’. In particular, this excludes specifications issued by largely self-styled industry fora. Finally, as standards are said to be established ‘through voluntary consensus building’, this definition also excludes legislation from being seen as standards. Thus, the sources from which standards may emerge are limited to recognised national, regional or international standards setting bodies.” See Jakobs K, 'Standardisation in Information Technology' (Proceedings of the 34th Annual Hawaii International Conference on System Sciences, 06 January 2001) <https://ieeexplore.ieee.org/document/926523/media> accessed 1 September 2019.

(ISO), the international SSO in which most national SSOs participate, defines a standard as a:

document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context. NOTE: Standards should be based on the consolidated results of science, technology and experience, and *aimed at the promotion of optimum community benefits*.²³² (emphasis added)

This definition is the predominant one among formal SSOs and has been adopted with a similar wording by all the ESOs, including ETSI,²³³ and the International Telecommunication Union (ITU).²³⁴ The Commission also relies on a similar definition:

Standards are voluntary documents that define technical or quality requirements with which current or future products, production processes, services or methods may comply. Standards result from voluntary cooperation between industry, public authorities and other interested parties collaborating within a system founded on openness, transparency and consensus.²³⁵

Standards, in the context of such standardisation, have the following defining features. They are developed by formal SSOs, industry consortia, and fora on a voluntary basis based on consensus among the involved parties. They encompass a set of principles and technical requirements to ensure compatibility, interoperability, and

²³² ISO/IEC Guide 2:2004, para 3.2.

²³³ ETSI Directives , ETSI Drafting Rules, 1, 215.

²³⁴ ITU-T, 'Terms and definitions for conformance and interoperability' Q.3920 (08/2016) available at <https://www.itu.int/rec/T-REC-Q.3920-201608-I/en> accessed on 1 September 2019.

²³⁵ European Commission, Communication on 'A strategic vision for European standards: Moving forward to enhance and accelerate the sustainable growth of the European economy by 2020' COM(2011) 311, 1st June 2011.

compliance of products, processes, services or methods with either industry or legislative requirements.

In this regard, one question that arises is whether technical standards should be treated as a form of public goods. In general, public goods considered to be goods and services that public authorities produce for which users pay taxes (e.g. roads, education, and defence).²³⁶ In recent years, however, the model of public goods has been expanded to include regulatory outputs.²³⁷ Against this backdrop, economists have regarded committee-based (*de jure*) standards, namely standards that are part of the legislative process and are developed by formal SSOs, as public goods.²³⁸ The analogy that can be drawn between the traditional notion of public goods and technical standards is that users enjoy the benefits of standard-compliant goods and services (i.e. health and safety, interoperability and compatibility) emanating from regulatory processes.²³⁹

Technical standards share some common qualities with public goods as they are available to all and increase or provide interoperability to those who wish to enter

²³⁶ Veljanovski CG, *Economic Principles of Law* (Cambridge University Press 2007) 40.

²³⁷ Drahos P, 'The Regulation of Public Goods' (2004) 7 *Journal of International Economic Law* 321; Geradin D and McCahery JA, 'Regulatory Co-Opetition: Transcending The Regulatory Competition Debate' in Jordana J and Levi-Faur D, *The Politics of Regulation : Examining Regulatory Institutions and Instruments in the Age of Governance* (Edward Elgar 2004) 94-95; Myles G, 'Public Goods' in Myles GD (ed) *Public Economics* (Cambridge University Press 1995) 257.

²³⁸ Kindleberger CP, 'Standards as Public, Collective and Private Goods' (1983) 36 *Kyklos* 377; David PA and Shurmer M, 'Formal Standards-Setting for Global Telecommunications and Information Services: Towards an Institutional Regime Transformation?' (1996) 20 *Telecommunications Policy* 789; Bekkers R and Liotard I, 'European Standards for Mobile Communications: The Tense Relationship Between Standards and Intellectual Property Rights' (1999) 3 *European Intellectual Property Review* 110.

²³⁹ Geradin D and McCahery JA, 'Regulatory Co-Opetition: Transcending The Regulatory Competition Debate' in Jordana J and Levi-Faur D, *The Politics of Regulation : Examining Regulatory Institutions and Instruments in the Age of Governance* (Edward Elgar 2004) 95; Berg SV, 'Technical Standards as Public Goods: Demand Incentives for Cooperative Behavior' (1989) 17 *Public Finance Quarterly* 29.

the market.²⁴⁰ According to the economic literature, public goods are non-exclusive and non-rivalrous, their use by any individual does not preclude its use by its users, while the cost to acquire them is low.²⁴¹ Although technical standards share attributes of public goods,²⁴² such as accessibility for everyone, it would appear more appropriate to conceptualise them as quasi-public, or with the character of both public and private goods, for the following reasons.²⁴³ Standards developed and produced by formal SSOs, such as ETSI, may be non-rival and non-excludable in theory but this is not reflected always in practice.

In terms of the non-rivalrous element, active participants in ETSI's standardisation process often strive for the selection of their technologies during the development of a technical standard. Although this selection process determines which technologies are meritorious solutions to a problem, few become part of a standard. This creates the phenomenon known in the literature as "winner-take-all",²⁴⁴ where

²⁴⁰ Leiponen AE, 'Competing Through Cooperation: The Organization of Standard Setting in Wireless Telecommunications' (2008) 54 *Management Science* 1904, 1906.

²⁴¹ Samuelson PA, 'The Pure Theory of Public Expenditure' (1954) 36 *The Review of Economics and Statistics* 387; Samuelson PA, 'Diagrammatic Exposition of a Theory of Public Expenditure' (1955) 37 *The Review of Economics and Statistics* 350; Sandler T and Tschirhart JT, 'The Economic Theory of Clubs: An Evaluative Survey' (1980) 18 *Journal of Economic Literature* 1481; Romer PM, 'Endogenous Technological Change' (1990) 98 *Journal of Political Economy* S71.

²⁴² Foray states that these attributes are: "(1) the indivisibility of whatever benefits the goods provide among the separate members of the group enjoying them, and (2) the condition that every member of the group has equal access to the total quantity of the good which is made available by the group." Foray D, 'Users, Standards and the Economics of Coalitions and Committees' (1994) 6 *Information Economics and Policy* 269, 275.

²⁴³ Jordan J, 'Product Standards, Innovation and Regulation' (1994) 6 *Technology Analysis & Strategic Management* 341, 342; Oigus coined the term impure public goods suggesting that: "There are many commodities which, though not pure public goods, nevertheless contain some public good dimension—they are sometimes referred to as 'impure' public goods." *Supra* note 5 in Oigus AI at 34.

²⁴⁴ Lee E, Lee J and Lee J, 'Reconsideration of the Winner-Take-All Hypothesis: Complex Networks and Local Bias' (2006) 52 *Management Science* 1838.

the standard setting outcome defines and “crowns” the “winner” and the technologies that are considered to be the best for the industry. Yet, there are numerous factors that drive the development of a technical standard, including network effects, the existing installed base and infrastructure of a networked system, compatibility with other systems, switching costs, and IPRs. On the one hand, while industry participants vie for the inclusion of their technologies in the pre-standardisation stage, once the technologies are selected and incorporated into a standard, as a matter of policy, they become available to all potential users for adoption.²⁴⁵ On the other, the collective character of standardisation aims at shared strategic purposes/interests, e.g. interoperability and compatibility of products and services.²⁴⁶

In the case of ETSI, however, as the standardisation process primarily involves patented technologies, the availability of a standard is inextricably bound up with the licensing of SEPs. Therefore, after the realisation of a standard, a SEP holder and technology/standard user need to enter negotiations for FRAND licences for the SEP users to be able to implement a standard without infringing it. A stressing issue in the licensing process of SEPs is the consequences of fruitless negotiations. Where the licensing negotiations fail, the SEP users face an ex post risk of enforcement actions and preclusion from using patented technologies. Thus, SEPs do not comply

²⁴⁵ Organization for Economic Co-operation and Development (OECD), ‘Standard Setting’ (2010), DAF/COMP(2010)33, 1, 244.

²⁴⁶ Based on Olson’s theory of collective action, the collaboration among a group of players with a common interest does not automatically result in a collective action or, alternatively, may be considered as a suboptimal collective action. See Olson M, *The Logic of Collective Action : Public Goods and the Theory of Groups* (Harvard University Press 1977); Binenbaum E, ‘Incentive Issues In R&D Consortia: Insights From Applied Game Theory’ (2008) 26 *Contemporary Economic Policy* 636; Lupia A and Sin G, ‘Which Public Goods are Endangered?: How Evolving Communication Technologies Affect The Logic of Collective Action’ (2003) 117 *Public Choice* 315.

with the non-excludable element of public goods by virtue of the exclusionary features of IPRs that reside within SEPs, rendering them *stricto sensu* a private good. Accordingly, ICT proprietary standards may be non-rival and while not intended as such, not always non-excludable. This also justifies the inherent tension between patents and standards.²⁴⁷ They, thus, have a duality of private and public goods.²⁴⁸

As previously discussed, it was the very introduction of the European standardisation policy, i.e. the New Approach, that was instrumental to enabling trade between Member States by addressing the essential policy objectives of protecting and promoting safety, health, environmental and consumer protection in lieu of the prior system that permitted individual States and their national bodies to impose standards as unjustifiable trade barriers.²⁴⁹ Standardisation, therefore, supports public policy goals, ensures representation of the public interest, and contributes to the protection of the public and consumer welfare.

The Commission has consistently emphasised the role and indispensability of harmonised ICT standards as a key factor in support of European policies and

²⁴⁷ In the same spirit, Iversen illustrated this tension describing that patents are private rights whereas standards a public good. Iversen EJ, 'Patenting and Voluntary Standards: Tensions Between the Domains of Proprietary Assets and "Public Goods" in the Innovation of Network Technologies' (2001) 14 Science & Technology Studies 66.

²⁴⁸ Pentheroudakis C, Baron J and Thumm N, *Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases* (Publications Office of the European Union, 2017) 1, 164.

²⁴⁹ European Council, Resolution of 7 May 1985 on a new approach to technical harmonization and standards (1985) C 136/1; Treaty On European Union And Of The Treaty Establishing The European Community [2002] C 325/1, Chapter 3, Articles 94-95; Treaty on European Union and the Treaty on the Functioning of the European Union [2012] OJ C 326/94, Chapter 3, Article 114 (ex Article 95 TEC); European Parliament and the Council, Decision No 768/2008/EC on a common framework for the marketing of products, and repealing Council Decision 93/465/EEC, L 218/82, 9 July 2008; Regulation (EC) No 765/2008 on setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93 [2008] OJ L 218/30.

legislation concerning the EU economy, the competitiveness of the European industry, technological innovation, diffusion and convergence as well as safety, interoperability, accessibility and environmental impact under the ESO formal standard setting attributes of transparency, inclusivity and openness.²⁵⁰ Thus, the Commission highlighted the important role of standardisation in the development of the Single Market in its ‘General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association’.²⁵¹ European standardisation is therefore indivisible from the EU public interest and EU public policy. Further, the European Council specifically recognised this in its Resolution ‘on the role of European standardization in the European economy’, stating: “European standardization [...] also serves the public interest [...]”.²⁵² It subsequently emphasised this alignment of EU public interest and policy, noting: “[...] the role of European standardisation as a means to meet specific needs of the European market, *to serve the public interest, in particular in support of European policies* [...]”²⁵³ (Emphasis added)

²⁵⁰ European Commission, White Paper Modernising ICT Standardisation in the EU - The Way Forward, COM (2009) 324 final, 3.7.2009, 2For illustrative examples of communications where the Commission has highlighted the importance of ICT standardisation, see, e.g., the European Commission on ‘Standardization and the Global Information Society the European Approach’ COM(96) 359 final, 24.07.1996; The European Commission on ‘the role of European standardisation in the framework of European policies and legislation’ COM(2004) 674 final, 18.10.2004; The European Commission ‘Towards an increased contribution from standardisation to innovation in Europe’ COM(2008) 133 final, 11.3.2008; The European Commission, White Paper Modernising ICT Standardisation in the EU - The Way Forward, COM(2009) 324 final, 3.7.2009.

²⁵¹ General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association, OJ C 91/8, 28 March 2003.

²⁵² European Council, Resolution on the Role of European standardisation in the European Economy, OJ 1992 C 173/9, 18 June 1992, para 9.

²⁵³ European Council, Resolution on the role of standardisation in Europe, OJ C 141/01, 28 October 1999.

The public benefit and interest reflected in standards have also been recognised by individual Member States. The UK, for example, specified this very view in a document between the Department of Industry and Trade (DIT) and the UK national standards body, the British Standards Institute (BSI), where it was agreed that public policy goals should be pursued through standardisation.²⁵⁴ The agreement paved the way to the signing of a Memorandum of Understanding on standards with the UK Government. The upshot of the Memorandum was that formal standardisation whether national, regional or international serves UK public policy and that “[...] the capability to develop and promulgate formal standards *is in the public interest* [emphasis added], because other standardisation products do not necessarily provide the full benefits of formal standards to all stakeholders including, for example, consumers.”²⁵⁵ This is indicative of the fundamental role that standardisation plays in the European as well as in the domestic public policy.

From a legislative standpoint, the Regulation 1025/2012 on European Standardisation constitutes the backbone of EU standardisation.²⁵⁶ The Regulation pinpoints the founding principles, namely coherence, transparency, openness, consensus, voluntary application, independence from special interests,²⁵⁷ whereas Annex II dedicated to ICT technical specifications provides detailed definitions for the trinity

²⁵⁴ Department of Industry and Trade (DIT), ‘The Public Policy Interest in the UK in Standardisation’ (2000) available at <https://webarchive.nationalarchives.gov.uk/20070628230000/http://www.dti.gov.uk/files/file11318.pdf> accessed on 1 September 2019.

²⁵⁵ British Standards Institute (BSI), ‘Memorandum of Understanding (MoU) between the United Kingdom Government and the British Standards Institution’ (2002) paras 1.4 and 2.4 available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/461415/Memorandum_of_Understanding.pdf accessed on 1 September 2019.

²⁵⁶ *Supra* note 208 Regulation 1025/2012.

²⁵⁷ *Ibid* para 2.

of principles of openness, consensus, and transparency.²⁵⁸ These are defined as follows:

(a) openness: the technical specifications were developed on the basis of open decision-making accessible to all interested parties in the market or markets affected by those technical specifications;

(b) consensus: the decision-making process was collaborative and consensus based and did not favour any particular stakeholder. Consensus means a general agreement, characterised by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments. Consensus does not imply unanimity;

(c) transparency:

(i) all information concerning technical discussions and decision making was archived and identified;

(ii) information on new standardisation activities was publicly and widely announced through suitable and accessible means;

(iii) participation of all relevant categories of interested parties was sought with a view to achieving balance;

(iv) consideration and response were given to comments by interested parties.²⁵⁹

These principles are characteristics analogous to effective regulation generally as viewed from the public interest perspective as well as ancillary to public policy objectives.

A juxtaposition of special interests and public interest appears within the Regulation, but rather in a neglected fashion and mentioned twice without any further explanation: “[l]ike other standards, standards for services [...] should take into

²⁵⁸ Ibid para 3.

²⁵⁹ Ibid Annex II.

account the public interest and be based on the founding principles[...]”²⁶⁰ and “European standards and European standardisation deliverables shall be market-driven, take into account the public interest as well as the policy objectives [...]”²⁶¹

The above discussion illustrates that the European approach to standardisation resides within the public interest as promulgated within standards and pursuant to EU Directives. Standardisation comprises a policy tool in the EU regulatory toolbox that the EU organs have at their discretion. It has been enshrined in the better regulation framework and regarded as fit for application in other sectors “[...] as a means of improving and simplifying legislation wherever possible.”²⁶² This section discussed that standards as a governance mechanism secure a variety of public interest and societal welfare objectives. However, such public policy objectives could be undermined if private interests permeate the standardisation process. The next section will demonstrate how ICT standardisation has become a vehicle for self-interest seeking by SEP holders via their participation in the standardisation process.

²⁶⁰ Ibid para 11.

²⁶¹ Ibid Article 10(1).

²⁶² European Council, Resolution on the role of standardisation in Europe, OJ C 141/01, 28 October 1999.

3.4.3 Standardisation Strategies, Opportunism, and Self-interests

This section lays the conceptual groundwork for the concept of agency capture in standard setting by analysing the correlation between strategic and opportunistic behaviour of SEP holders as well as how agency capture arises in the pursuit of private interests. Employing this framework, the implications of standardisation strategies in ICT are outlined before perspectives for opportunism in standard setting as a form of agency capture are drawn.

Standardisation has both a positive and negative impact on technological evolution. Although it facilitates the development of interoperable technologies and market harmonisation, it leads to the reduction of choices.²⁶³ Standards play a dual role in that they concurrently enable and constrain.²⁶⁴ Although they limit potential variety of standards, they encourage “credibility, focus and critical mass in markets for new technologies.”²⁶⁵ Thus, with the adoption of a formal standard, market stakeholders must strategically revise their business model to ensure compatibility with the current standards.²⁶⁶ However, as will be analysed below, illegitimate standardisation strategies could become the vehicle for opportunism. Importantly, a conflict of interests accrues from such strategies between the pro-competitive character of standard setting and the narrow self-interests of SEP holders. Also, SSO operations

²⁶³ Kang B and Motohashi K, 'Essential Intellectual Property Rights and Inventors' Involvement in Standardization' (2015) 44 *Research Policy* 483.

²⁶⁴ Garud R, Jain S and Kumaraswamy A, 'Institutional Entrepreneurship in the Sponsorship of Common Technological Standards: The Case of Sun Microsystems and Java' (2002) 45 *The Academy of Management Journal* 196, 198.

²⁶⁵ Swann GP, *The Economics of Standardization: An Update*, (Report for the UK Department of Business, Innovation and Skills (BIS), 2010) 1, 9 available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/461419/The_Economics_of_Standardization_-_an_update_.pdf accessed 1 September 2019.

²⁶⁶ Tassej G, 'Standardization in Technology-Based Markets' (2000) 29 *Research Policy* 587.

are based on the presumption of co-operation to build ICT standards for wide adoption, yet strategic behaviours could impede the adoption of standards, raising costs and stifling innovation.

The major technological advancements, experienced over the last decade, steered the development of wireless telecommunications networks. However, the development of wireless standards is incremental and there is a strong interdependence between the generations of mobile networking technologies, i.e. 3G, 4G, and 5G. Traditionally, the development and ownership of the early generations of those standardised technologies was concentrated largely under the same vendors.²⁶⁷ However, with the ever evolving landscape of the ICT market and by virtue of the rise of smartphones and their operating systems, new players have entered the market signalling a change in the standard setting and licensing of SEPs. Specifically, when companies such as Apple, Google, and RIM, entered the smartphones arena, they required access to essential patents to design standard-compliant devices as well as to keep production costs low.²⁶⁸ The arrival of new players in the smartphone market, however, has triggered new modes of SEP licensing strategies.

First, many competitors have actively acquired SEPs, thereby a number of large SEP portfolio transactions have occurred. In 2010, the Rockstar consortium, a partnership between Microsoft, Blackberry, Ericsson, Sony, and Apple, acquired the bankrupted Nortel's portfolio of 6,000 patents for US\$4.5 billion containing a large

²⁶⁷ European Competitiveness and Sustainable Industrial Policy Consortium, 'Patents and Standards: A modern Framework for IPR-based Standardization' (2014) 1, 67.

²⁶⁸ World Intellectual Property Organization (WIPO), *Report 2017: Intangible Capital in Global Value Chains* (Geneva: World Intellectual Property Organization 2017) 1, 110 onwards available at https://www.wipo.int/edocs/pubdocs/en/wipo_pub_944_2017.pdf accessed on 1 September 2019.

number of LTE SEPs from which 4,000 were sold subsequently to RPX Corp., a patent risk management provider.²⁶⁹ Later, Google acquired for US\$12.5 billion a similar portfolio of 17,000 LTE SEPs from Motorola Mobility.²⁷⁰ These examples are illustrative of the economic value and indispensability of SEPs for the smartphones industry and the strong competition between the smartphone rivals.

Second, the patent filing of technologies that build on a standard and the acquisition of SEP portfolios has become not only increasingly commonplace in recent years but also essential to the strategy of successful high-tech companies. ETSI has been at the epicentre of the ICT standardisation as evidenced in a recent report that has been conducted on the behalf of the Commission. The report, *Landscaping Study on Standard Essential Patents*, makes key observations about the competitive landscape of SEPs in ICT industries from both a global perspective and a regional one, including ETSI standardisation.²⁷¹ It first shows that 70% of worldwide SEPs related to wireless telecommunications standards were declared at ETSI.²⁷² Second, the report indicates that the largest SEP families related to generations of widely adopted telecommunication technologies, i.e. GSM, UMTS and LTE standards, were concentrated under ETSI.²⁷³ It is also evident from the report that companies such as Qualcomm, Samsung, Huawei, Google, and ZTE own SEP portfolios of great size.²⁷⁴ Qualcomm, Nokia, Interdigital and Samsung patent portfolios received the

²⁶⁹ Ibid; Bekkers R, 'Where Patents and Standards Come Together' in Hawkins R, Blind K and Page Ra (eds), *Handbook of Innovation and Standards* (Edward Elgar Publishing 2017) 230.

²⁷⁰ Ibid.

²⁷¹ Pohlmann T and Blind K, *Landscaping study on Standard Essential Patents (SEPs)* (Iplytics GmbH, Technical University of Berlin, 2016) 1.

²⁷² Ibid 11.

²⁷³ Ibid 13-16

²⁷⁴ Ibid 26-28

highest declared SEP citation shares. This is clearly justified since all four contributed to the standardisation activities of early generations of wireless telecommunication networks for GSM and UMTS, in contrast to other SEP holders who joined the standardisation process at a later stage.²⁷⁵

Third, the report suggests that SEPs have become a progressively important asset for their holders' competition in the smartphone arena, and for this reason there is an increase in trading SEPs between different market participants. It reveals a further trend of internet companies such as Google, Twitter, and Facebook acquiring SEPs to enter new markets.²⁷⁶ For example, Google acquired Motorola Mobility portfolio to enter the smartphone sector.²⁷⁷ Despite the acquisition of patent portfolios, companies like Qualcomm, Apple, Blackberry and Intel are actively buying SEPs.²⁷⁸ These trends suggest that the competition in the smartphone era is not only dependent on the merits of technological advancement but also on the acquisition, cross-licensing, and aggregation of standardised patent as well as portfolio strategies. This links to another trend that has emerged in the ICT market that of market concentration where the tech giants expand their market power and market shares via licensing and cross-licensing of IPR assets, notably patents.²⁷⁹

Fourth, the development of unlawful licensing strategies is real. In such a strategy, including but not limited to the example of patent holdup, SEP holders can

²⁷⁵ Ibid 30

²⁷⁶ Ibid 31

²⁷⁷ Google, 'Facts about Google's acquisition of Motorola' available at <https://www.google.com/press/motorola/> accessed on 1 September 2019.

²⁷⁸ Supra note 271 Landscaping study on Standard Essential Patents 31.

²⁷⁹ See 5.3.1.2 for a discussion on market concentration of big-tech firms.

use their SEP/non-SEP portfolios to either exclude SEP users from practising the standardised technology in order to derive greater profits from their own products in the market or to force adverse licensing conditions or to extract higher royalties. Those strategies, potentially exclusionary or exploitative, however, could breach competition law rules; hence, abuse of dominance is not an unfamiliar phenomenon observed with the licensing of SEPs.

A straightforward example is Qualcomm's activities based on unlawful licensing strategies violating competition law rules. Qualcomm while the monopoly supplier of baseband chipsets (also known as modem or baseband chips) compliant to the 3G (UMTS and CDMA) and 4G (LTE) standards for many manufacturers, is also the proprietor of SEPs relying on the same standards. Such baseband chips, however, are not subject to FRAND terms. Qualcomm's licensing practices involved a "no license, no chips" policy (tying) forcing its users to buy its baseband chipsets in order to grant them SEP licences for the same standards (CDMA and LTE).²⁸⁰ In the antitrust case between the FTC and Qualcomm, the Judge Koh ruled that this constituted an anticompetitive exclusive dealing harming rivals, OEMs, and end consumers, and stifling innovation in the chip markets.²⁸¹ Qualcomm's unlawful

²⁸⁰ *FTC v Qualcomm* (2019) US District Court Northern District of California San Jose Division, Case No.17-CV-00220-LHK.

²⁸¹ *Ibid* 215.

conduct took place globally but it has not escaped competition law scrutiny, resulting either in the initiation of antitrust investigations or the issuance of fines in Korea, Taiwan, and Japan.²⁸²

Recently, in Europe, the Commission launched two formal investigations against Qualcomm regarding exclusivity payments and predatory pricing for 3G (UMTS) and 4G (LTE) baseband chipsets.²⁸³ In terms of the first investigation, the Commission found that Qualcomm infringed Article 102 TFEU and Article 54 of the Agreement on the European Economic Area, between 2011 and 2016, by granting payments (also termed as exclusivity payments) to Apple with the condition that Apple obtain from Qualcomm all of its requirements of LTE, UMTS and GSM chipsets.²⁸⁴ The Commission, after determining that Qualcomm was in a dominant position in the relevant market for LTE chipsets, it ruled that Qualcomm's exclusivity payments to Apple were detrimental to competition and to consumers imposing a fine of €997 million for abusing its market dominance in LTE baseband chipsets.²⁸⁵ Regarding the second investigation, the Commission found that Qualcomm abused its dominance between mid-2009 and mid-2011 by engaging in predatory pricing. Qualcomm sold UMTS chipsets below cost to Huawei and ZTE in order to foreclose

²⁸² The Korea Fair Trade Commission (KFTC) fined Qualcomm \$927 million for refusal to license SEPs to competing modem chipset makers and coercing agreement terms. See *Korea Fair Trade Commission v Qualcomm* [2017] Decision No. 2017-0-25; The Taiwan Fair Trade Commission (TFTC) imposed a \$778 million fine to Qualcomm for refusal to license and for grant backs to Apple. *Taiwan Fair Trade Commission v Qualcomm* [2017] Disposition Kung Ch'u Tzu No. 106094; The Japan Fair Trade Commission (JFTC) ordered Qualcomm to cease and desist from imposing illegitimate licensing terms to its licensees. Japan Fair Trade Commission, 'Cease and Desist Order against Qualcomm Incorporated', available at <https://www.jftc.go.jp/en/pressreleases/yearly-2009/sep/individual-000038.html> accessed on 30 Apr. 19.

²⁸³ European Commission, Press Release Antitrust: Commission sends two Statements of Objections on exclusivity payments and predatory pricing to Qualcomm, IP/15/6271, 8 December 2015.

²⁸⁴ Case AT.40220 — *Qualcomm* (Exclusivity Payments) [2018] 2018/C 269/16.

²⁸⁵ *Ibid.*

Icera, Qualcomm's key rival at that time.²⁸⁶ The Commission emphasised that "Qualcomm's conduct had a significant detrimental impact on competition" driving Icera eventually out of the baseband chips market. Therefore, it imposed another fine of € 242 million for violating Article 102 TFEU.

Hovenkamp examining Qualcomm's conduct underscored that "tying may provide a backdoor means of violating a FRAND agreement", explaining that what Qualcomm sought was to tie a FRAND-regulated service (SEPs) with an unregulated complement (chips) to extract higher royalty fees and expand or maintain its dominance.²⁸⁷ Indeed, Qualcomm's anticompetitive practices clearly illustrate the power that SEPs confer to their holders and how easily the SEP users can be manipulated by SEP holders. This is exacerbated when there is significant concentration of market power as in the example of Qualcomm.²⁸⁸ Therefore, illegitimate SEP licensing practices can contribute to the furtherance of dominance of SEP holders damaging competition by driving competitors out of the market.

As discussed above, SSOs play a pro-competitive role as they can drive technological advancement and innovation by enabling technology dissemination in the market at the same time. Yet, SEP holders' strategic and opportunistic behaviour could jeopardise this role by exploiting standard setting. In light of the global increase in the SEP litigation, the question arises whether market players use standard

²⁸⁶ European Commission, 'Press Release Antitrust: Commission fines US chipmaker Qualcomm €242 million for engaging in predatory pricing', (2019) IP/19/4350, 18 July 2019.

²⁸⁷ Hovenkamp E, 'FTC v. Qualcomm: New Frontiers in the Antitrust-IP Interface' (2019) 1, 3-4 available at <https://ssrn.com/abstract=3397312> accessed on 1 September 2019. See also Hovenkamp E, 'Tying, Exclusivity, and Standard-Essential Patents' (2017) 12 *The Columbia Science & Technology Law Review* 79.

²⁸⁸ Market concentration and Qualcomm's conduct will be further discussed in 5.3.1.2.

setting to serve their private interests, i.e. market supremacy and profit maximisation.

Current licensing strategies are characterised primarily by the acquisition and the expansion of SEP portfolios. These tactics, however, have a direct impact on the SEP users. The more aggressive these strategies are, the more intimidating they become for users. As another report, '*Licensing Terms of Standard Essential Patents*', of the Joint Research Centre (JRC) stresses that: "[...] the evolving practices of privateers and non-practicing entities, put pressure on innovators and implementers to reassess the potential gains and risks of their standardization strategies and current business models"²⁸⁹ which "[...] have a significant impact on the incentives to innovate, implement and participate in standard setting."²⁹⁰

Beyond that, these strategies foster a hostile setting where dominant market players can behave anticompetitively. This could be another explanation why opportunism is encountered at increasing rates over the last decade. Among other consequences of aggressive strategies, the report highlights that patent holdup; the threat and predictability of injunctive relief; and assumptions of essentiality, validity and infringement have had "[...] a major, cumulative impact on a wide range of interlocking strategic, financial and tactical decisions for innovators and implementers along the value chain [...]."²⁹¹ The report outlines that the existing SEP licensing practice pose significant risks for innovation and SEP users. Further to the impact on the standardisation and innovation process, is that consumers' interests could

²⁸⁹ Supra note 248 in Pentheroudakis C and Baron JA at 161.

²⁹⁰ Ibid.

²⁹¹ Ibid 162.

also be adversely affected with the restriction of supply and increased prices of components and ultimately products.

Having pieced together the licensing strategies and opportunism in standard setting, it must be concluded that self-interests are strongly embedded therein. But when those strategies obstruct reasonable access to SEPs, by holding up, the primary pro-competitive purpose of standard setting is defeated as a result. This has been the case with a number of ETSI members, who have arguably abused their monopolistic power with relation to SEPs developed under the auspices of ETSI. Opportunism, and particularly patent holdup, is disturbing the integrity and the balance of standard setting regime by creating a tension and conflict between SEP holders' private interests and users' interests as identified in the public interest goals of access to standards to promote innovation and technological progress and dissemination.

From the regulatory capture theory point of view, the opportunistic behaviour of SEP holders clearly encompasses the pursuance of narrow private interests against these broader public interests, that also encompass consumer welfare. To put it differently, opportunism is the perversion of participating in the standardisation process *ex post* with the result of capture. Thus, the convergence of patent holdup and capture is definite. As will be shown in Chapter 4, by strongly influencing the outcomes of the standardisation process with the submission and inclusion of their technologies into standards, SEP holders can manipulate and capture the standard setting regime to exercise tactics for narrow self-interest. Simply, although SEP holders offer their technologies for inclusion into standards, this may only be baited to ensure access to the standardisation process. With capture, SEP holders have the option to behave opportunistically exploiting regulatory imperfections in standard

setting²⁹² and unfairly increase their benefits at the expense of the others. In addition, once capture is established, third parties are at risk of becoming a victim of opportunism.²⁹³

3.5 Conclusion

The technical harmonisation in Europe has been transformed over decades. With the introduction of the New Approach and ETSI's establishment, co-regulation emerged in the setting of technical standards. The regime for this co-regulation and governance in standard setting shaped a principal-agent relationship between the Commission and ETSI. In light of the agency theory and theories of regulation with respect to agency problem and agency capture, this chapter developed a contextual framework under which patent holdup and opportunistic behaviour were linked with the theoretical construct of capture.

The chapter's critical examination of SEP strategies paves the way for the following chapter to establish that the root cause of patent holdup is the capture of the agent (ETSI). Opportunism as shown here is construed from a regulatory standpoint to mean the narrow self-interests against the public interest that standards and standardisation encompass. The next chapter will demonstrate that the pursuit of narrow self-interests by SEP holders at the expense of SEP users suggests that the ETSI policies are not only ineffective to balance the interests of the technology contributors and the standards implementers but also insufficient to safeguard the pro-

²⁹² Specifically, SEP holders could exploit the lax IPR policies of an SSO as to the problem of patent holdup and aggressively enforce their SEPs thereby.

²⁹³ This is also known as opportunism interdependencies in corporate governance. See V. Werder A, 'Corporate Governance and Stakeholder Opportunism' (2011) 22 *Organization Science* 1345, 1348.

competitive role of standardisation. Therefore, ETSI, as the regulatory agent, may have become entrapped in a distorted relationship that favours its members who behave opportunistically without having any preventive mechanisms in place to protect the standardisation process and SEP users from patent holdup/opportunism.

Chapter 4 offers an analysis of ETSI's structure and rules in conjunction with regulatory capture to demonstrate ETSI's failure to obstruct patent holdup and fairly balance the interests of the technology contributors and the standard implementers. The need for better symmetry between the interests of standard developers and users is imperative as SEPs should not act as a blockade to the adoption and diffusion of technology standards. This calls into question both the lax policies of ETSI in monitoring its members as well as the Commission's failure to oversee ETSI, take anti-capture measures and correct the regulatory failure in standard setting.

4 REGULATORY CAPTURE AND STANDARD SETTING

4.1 Introduction

The previous chapter's theoretical analysis has linked the agency theory within standard setting and has shown that strategic practices such as patent holdup coincide with a form of capture. The sections of this chapter will delineate and substantiate the main bases for diagnosing capture. The chapter will show how capture can take effect within ETSI based on its institutional design, governance, structure, and IPR policies. Key here is the recognition that ETSI's institutional structure is fundamentally based on the decision-making of its members. The regulatory power, in this respect, resides in its members who can determine the future of standardisation. Thus, it is critical to understand the occurrence of the primary and internal capture in ETSI, coined here as "intra-capture".

Further, this chapter will examine the occurrence of a secondary capture, termed here as "inter-capture", of the Commission by ETSI. The concept of inter-capture will be explored against the rationales of the agency problem paradigm, namely information asymmetries, goal conflict, moral hazard. It theorises that these three conditions apply either directly or indirectly to the agency relationship of standard setting hampering the operations between the principal and the agent. The chapter expounds, therefore, on the agency problem that would justify the principal's regulatory intervention to correct the intra- and inter-capture.

4.2 Diagnosing Capture in ETSI

This section constructs the theoretical argument of “intra-capture” in ETSI. In order to build the conceptual model of intra-capture, certain tools must be employed. As discussed in Chapter 3,¹ this study adopts Carpenter’s ‘tripartite capture model’ to diagnose capture. As will be recalled, under this model, three parameters must be shown for capture to be established, namely:

- (a) the positing of a defensible model of public interest,
- (b) action and intent by the regulated industry, and
- (c) that ultimately policy is shifted away from the public interest and toward industry interest.²

All three conditions must be satisfied. What follows is the application of Carpenter’s model of capture to the case of ETSI. This model is employed as a diagnostic tool that allows the theoretical attestation of capture in standard setting. The analysis focuses on how ETSI members could opportunistically exploit the weighted voting system, enabling them to favour their self-preferences. Key determinants of pre-standardisation participation will be examined based on existing empirical evidence to provide a greater understanding of strategic behaviour of technical contributors (ex ante opportunism). As a result of this earlier pre-standardisation strategic conduct, the patent holdup (ex post opportunism) occurring post-standardisation could be considered as merely a continuation of or just one part of the full strategic participation in standard setting. Lastly, the controversial development of ETSI’s IPR

¹ See section 3.3.3.

² Posner RA, ‘The Concept of Regulatory Capture: A Short, Inglorious History,’ in Carpenter D and Moss DA, *Preventing Regulatory Capture: Special Interest Influence and How to Limit It* (Cambridge University Press 2013) 63.

Policy will be scrutinised to illustrate the pressure ETSI received to adopt favourable policies for industry participants.

Each of the following sections tests, primarily on theoretical grounds, the three parameters of Carpenter's model against the standard regime of ETSI, examining ETSI's structure, governance, and regulatory development of IPR policies.

4.2.1 The Hollow Concept of Public Interest

Consider the first parameter of the tripartite capture model, the defeasible model of public interest. The previous chapter illustrated that while theoretically ICT standardisation should embody the public interest,³ the reality of ICT standardisation shows differently, having been transformed into a battleground for big-tech firms.

The New Approach formed a partnership between the Commission and ETSI devising a co-regulatory regime for standard setting to serve the public interest from the outset. However, with the unprecedented and exponential growth of the ICT and digital marketplace with its ensuing value, SEPs have become the vehicle for market supremacy and a weapon for the so-called 'smartphone wars'. As shown, the cumulative tension and strategic behaviour among industry players has undermined the public interest with opportunism and self-interests having gradually distorted the concept of public interest. This has turned standard setting into a field of competing

³ See 3.4.2. and 3.4.3.

private interests. The following parts illustrate this premise by identifying and evaluating the special interests that can appear in ETSI's procedures, institutional design, and outcomes.

4.2.2 ETSI Structure and Policy Development: Grounds for Capture

Turning to the second prong of the tripartite model of capture, namely regulated industry intent to steer regulation away from the public interest and toward private interests, the following sections draw on ETSI's governance, decision-making, administrative design and structure to explain and demonstrate this.

ETSI's fundamental principles are the timely development of standards; consensus-based decision making; and openness based on a diverse membership of stakeholders.⁴ The operations and the principles of ETSI are governed by different bodies. Article 10 of the ETSI Directives lays down the structure of the institute whereby: "[t]he Institute shall comprise a General Assembly, a Board, a Technical Organization, Special Committees, Industry Specification Groups, Coordination Groups and a Secretariat headed by a Director-General."⁵

This study will focus on ETSI's General Assembly, Board, and IPR Special Committee as most relevant here. The General Assembly is the top decision-making authority and the main governing body of ETSI that reviews rules and regulations,

⁴ ETSI, 'Standards Making' available at <https://www.etsi.org/standards/standards-making> accessed on 1 September 2019.

⁵ ETSI, 'ETSI Directives: Article 10 of ETSI Statutes', 1, 9.

membership, financial matters, annual reports, approval of standards, standardisation performance, communication and procedural matters of the organisation.⁶ It is comprised of full and associate members, explained in the section that follows, that have the right to vote. As will be analysed later in the section, decision-making is based on a weighted voting system, which is directly connected to membership tiers and so-called ‘units of contribution’, acquired through membership subscription.⁷

Appointed by the General Assembly, the Board is a body that acts on its behalf. The members of ETSI nominate candidates for the Board who are elected to the Board via the weighted individual voting basis.⁸ In terms of the responsibilities of the Board members, the ETSI Directives dictate that the Board members “act in an individual capacity rather than as a direct representative of an ETSI member. Board members act in the interests of the Institute and the membership. They shall use their best professional judgment in the execution of the tasks of the Board[.]” and “Board members shall inform the Director-General if they are no longer supported by their supporting ETSI member.”⁹

Similar to the other bodies within ETSI, the Special Committees are established by the General Assembly for defined tasks.¹⁰ One of those Special Committees is the ETSI IPR Special Committee, which is responsible for matters related to IPRs.

⁶ ETSI, ‘ETSI Directives : ETSI Statutes’ Article 11; Werle R and Fuchs G, ‘Liberalization and Integration’ (1993) 3 Utilities Policy 187, 190.

⁷ ETSI, ‘What Does Membership Cost?’ available at <https://www.etsi.org/membership/dues> accessed on 1 September 2019.

⁸ ETSI, ‘ETSI Directives : ETSI Rules of Procedures’ Annex 7 para 2, 1, 48.

⁹ Ibid.

¹⁰ ETSI, ‘ETSI Directives : ETSI Rules of Procedures’ Article 7: Special Committees, 1, 19.

Specifically, it organises meetings between ETSI members and other institutions acting as a forum where topics such as transfer of patent ownership, reciprocity, FRAND licensing, and injunctive relief are discussed.¹¹ Importantly, the ETSI IPR Special Committee contributed to the development and discussions for the creation of ETSI IPR Guide.¹²

Each of the above bodies governs the standardisation process in ETSI. ETSI's structure and organisation is based on a hierarchy with the General Assembly at the top of the pyramid and with the Board and other bodies below. Members' involvement is intrinsic to the functioning and operations of ETSI. The next section examines the participation of ETSI members in the governance of ETSI procedures, and the weighted voting system within ETSI as the main platform of decision-making for setting standards.

¹¹ ETSI, 'ETSI IPR committee progresses on Injunctive Relief' (2013) <https://www.etsi.org/news-events/news/732-2013-12-news-release-ipr-committee> accessed on 1 September 2019; ETSI, 'ETSI IPR committee continues discussions on injunctive relief' (2014) <https://www.etsi.org/news-events/news/812-2014-07-news-etsi-ipr-committee-continues-discussions-on-injunctive-relief> accessed on 1 September 2019; ETSI, 'Update from ETSI IPR committee' (2014) <https://www.etsi.org/news-events/events/9-news-events/news/757-2014-03-update-from-etsi-ipr-committee> accessed on 1 September 2019; ETSI, 'Presiding judge of the X. senate of the German federal supreme court, Dr. Peter Meier-Beck, addresses the ETSI IPR Special Committee' (2013) available at <https://bit.ly/2ZxP8Ao> accessed on 1 September 2019; ETSI, 'IPR dialogue continues at ETSI' (2013) <https://bit.ly/2NFOJ8G> accessed on 1 September 2019.

¹² Huber B, 'Why the ETSI IPR Policy Does not and has never Required Compulsory 'License to All': A Rebuttal to Karl Heinz Rosenbrock' (2017) available at <https://ssrn.com/abstract=3038447> accessed on 1 September 2019.

4.2.2.1 Decision-Making in ETSI

ETSI's decision-making procedures are founded on the principle of consensus¹³ (or the lack of sustained opposition) and based on a mixed membership structure system. Full and associate members have the right to partake in decision-making with their votes. The full members are those who are established in the geographical area of Europe (716 members) while the associate ones (foreign members) are established outside of the European region (144 members).¹⁴ The decisions are taken based on a weighted voting system, but there are two distinct procedures of decision taking as per Article 11 of the ETSI Directives: “[f]ull members shall have the right to vote on all matters except where Weighted National Voting applies. Associate members shall have the right to vote on all matters except where Weighted National Voting applies or where Weighed Individual Voting by Full members applies.”¹⁵ For these procedures, the principle of consensus is assured through a certain percentage of votes casted, and particularly, with the accumulation of at least seventy one percent (71%) of votes in favour.¹⁶

Turning to the ETSI voting system, voting weights are assigned in units of contribution that are associated with the member's Electronic Communications Related Turnover (ECRT), i.e. the higher the turnover is, the more units of contribution a company acquires.¹⁷ Table 1 below illustrates the cost of the units for full and

¹³ ETSI, 'ETSI Directives: ETSI Rules of Procedures' Article 11: Voting by the General Assembly, page 23.

¹⁴ ETSI, 'ETSI Annual Report 2019' (2019) 1, 55 available at <https://www.etsi.org/images/files/AnnualReports/etsi-annual-report-april-2019.pdf> accessed on 1 September 2019.

¹⁵ Ibid ETSI Directives.

¹⁶ Ibid.

¹⁷ ETSI, 'ETSI Directives: ETSI Rules of Procedures' Annex 2, page 31.

associate members which range between the scale of 1 and 45, and a cost starting from €2,000 and reaching over €150,000.¹⁸ Effectively, the weighted voting system is interlinked with the membership fee. The highest class receives the maximum number of units, 45, which allows their members to influence the decision-making process with their votes. ETSI members participate in the voting of a Technical Body; approval of ETSI standards and ETSI Guides; the election of officials to General Assembly; the election of Board members and Board Chairman; selection of Director-General; and, for full members only, matters relating to European Union.

CLASS	ECRT (million of euros)	NUMBER OF UNITS	CONTRIBUTIONS * (euros)
1	SMEs, user & trade associations, additional membership	1	6 000
	Universities, public research bodies and not-for-profit user associations		2 000
	Micro-Enterprises		3 000
2	Up to 135	2	9 380
3	136 to 200	3	12 760
4	201 to 450	6	22 900
5	451 to 700	9	33 040
6	701 to 1350	13	46 560
7	1351 to 2000	18	63 460
8	2001 to 3500	24	83 740
9	3501 to 5000	30	104 020
1	5001 to 8000	37	127 680
1	Above 8000	45	154 720

Table 1, ETSI Membership Classification

The national weighted voting is distinct from the individual (private members) one. It is only available to national standard bodies or administrative or other governmental bodies of the EU region that contribute to ETSI standardisation.¹⁹ The heads of national delegations cast their votes to decide on matters such as “dissolution of ETSI; disputes arising from the application of the Rules of Procedure; adoption and withdrawal of an ETSI standard or Harmonised Standard; amendments to the ETSI Statutes and Rules of Procedure including their Annexes; and weightings

¹⁸ ETSI, ‘2019 Contributions to ETSI’ available at <https://www.etsi.org/images/files/membership/ContriForm.pdf> accessed on 1 September 2019.

¹⁹ ETSI, ‘ETSI Directives: ETSI Rules of Procedures’ Article 11.2.1: Weighted National Voting, page 24.

allocation (for Weighted National Voting purposes) of new national delegations”.²⁰

The national weightings of the votes of national delegations are shown at the below table:

GERMANY	29
UNITED KINGDOM	29
FRANCE	29
ITALY	29
SPAIN	27
POLAND	27
ROMANIA	14
NETHERLANDS	13
RUSSIA	12
TURKEY	12
GREECE	12
PORTUGAL	12
BELGIUM	12
CZECH REPUBLIC	12
HUNGARY	12
UKRAINE	10
SWEDEN	10
AUSTRIA	10
BULGARIA	10
SWITZERLAND	10
SLOVAK REPUBLIC	7
DENMARK	7
FINLAND	7
NORWAY	7
IRELAND	7
SERBIA	7
CROATIA	7
LITHUANIA	7
ALBANIA	4
LATVIA	4
SLOVENIA	4
GEORGIA	4
ESTONIA	4
CYPRUS	4
LUXEMBOURG	4
MALTA	3
ICELAND	3
BOSNIA & HERZEGOVINA	3
THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA	3
MOLDOVA	3
MONTENEGRO	3

Table 2, Weighted Votes of National Standards Bodies

Lastly, the national weighted voting system differentiates from the individual one on the basis that it applies to the process of the adoption, maintenance or withdrawal of European standards (harmonised), as opposed to the individual weighted voting system where the full or associate members decide on ETSI standards or Guides.

ETSI’s institutional structure, including the voting system is its Achille’s heel in terms of regulatory capture. ETSI was originally created to accelerate the development and introduction of technical harmonisation via harmonised standards in Europe. However, with the expansion and the growth of the institution, private

²⁰ Ibid.

stakeholders (over 900 members to date) have played a pivotal role in ETSI's operations and governance. As a self-regulatory agency, ETSI members have the power and are entitled to frame the politics of the organisation. The class of subscription demarcates the degree of power that is given to members when converted to weighted votes. Specifically, the higher the subscription class a member possesses, the greater power they hold to influence the decision-making process.

4.2.2.2 ETSI's Self-Regulatory Regime

To understand how capture can take place in ETSI, its regulatory mode is scrutinised here. Political scholars have argued that there is the risk that, over time, a regulatory agency may become more eager to please private interests and be captured.²¹ This rationale applies aptly to ETSI's context. Traditionally, scholars have subscribed to the belief that reliance on private expertise coupled with self-regulation regimes does pose substantial risks of capture.²² It has been argued that although SRAs may advance public interest *prima facie*, however, they can be inherently dangerous as private parties are prone to capture.²³ Bartle and Vass point out that "[...]

²¹ Martimort D, 'The Life Cycle of Regulatory Agencies: Dynamic Capture and Transaction Costs' (1999) 66 *The Review of Economic Studies* 929; Bernstein MH, *Regulating Business by Independent Commission* (Princeton University Press Princeton 1955); Huntington SP, 'The Marasmus of the ICC: The Commission, the Railroads, and the Public Interest.' (1952) 61(4) *Yale L J* 467; Downs A, *Inside Bureaucracy* (Second edn, Little, Brown & Co 1967).

²² Thaw D, 'Enlightened Regulatory Capture' (2014) 89 *Washington Law Review* 329, 336; Shapiro SA and Steinzor R, 'Capture, accountability, and regulatory metrics' (2007) 86 *Tex L Rev* 1741; Sousa DJ and Klyza CM, 'New directions in environmental policy making: An emerging collaborative regime or reinventing interest group liberalism' (2007) 47 *Nat Resources J* 377, 427; Zinn MD, 'Policing Environmental Regulatory Enforcement: Cooperation, Capture, and Citizen Suits' (2002) 21 *Stan Envtl LJ* 81.

²³ Hatzopoulos V, *Regulating Services in the European Union* (Oxford University Press 2012) 289; Hood C, *Explaining Economic Policy Reversals* (Buckingham, 1994) Ch 2; Peltzman S, 'The Economic Theory of Regulation after a Decade of Regulation' (1989) *Brookings Papers in Macroeconomics*.

self-regulation seems to be the natural end point of regulatory capture and incompatible with the public interest.”²⁴ Kay posits another major criticism of SRAs that “with self-regulation, regulatory capture is there from the outset.”²⁵ There is also scholarly consensus that regulatory capture is likely to occur when the regulatees control or dominate the regulatory process or when they exert influence on the regulator to assure beneficial outcomes for their ends.²⁶ Although this regulatory discretion is the key feature of SRAs, it can also simultaneously be a prerequisite of capture.²⁷ In SRAs, discretion resides in the industry participants to make regulatory decisions. Although it has been posited that the high level of independence and regulatory discretion of an SRA may reduce considerations of governmental influence, the risk of undermining the principal’s policy preferences may increase.²⁸

²⁴ Bartle IAN and Vass P, 'Self-Regulation Within the Regulatory State: Towards A New Regulatory Paradigm?' (2007) 85 *Public Administration* 885.

This account has been previously observed by Ogus: “[...] private interests that are threatened by regulation may gain considerable benefits if they are allowed themselves to formulate and enforce the relevant controls.” See Ogus A, 'Rethinking Self-Regulation' (1995) 15 *Oxford Journal of Legal Studies* 97, 98.

²⁵ Kay J, 'The Forms of Regulation' in Seldon A (ed), *Financial Regulation - or over-Regulation?* (Institute of Economic Affairs 1988).

²⁶ Peltzman S, 'Toward a More General Theory of Regulation' (1976) 19 *The Journal of Law and Economics* 211.

Knill and Lenschow explain how capture could occur in private self-regulation due to coercive methods: “At first sight, private self-regulation seems to rely positively on pull factors as the incentive to escape top-down regulations induces private regulators to formulate and comply with own rules. This incentive depends on the presence of a coercive threat, however. If the shadow of the hierarchy is perceived as weak, industry may respond to the opposite incentive to cheat. Private actors might implement regulatory rules in a rather light-handed way as the threat of enforcement or later top-down intervention in case of self-regulatory failure is low.” See Knill C and Lenschow A, 'Modes of Regulation in the Governance of the European Union: Towards a Comprehensive Evaluation' in Jordana J and Levi-Faur D (eds), *The Politics of Regulation: Institutions and Regulatory Reforms for the Age of Governance* (Edward Elgar 2004) 229.

²⁷ *Supra* note 21 in Bernstein MH at 145.

²⁸ Majone G, 'The Politics of Regulation and European Regulatory Institutions' in Hayward J and Menon A (eds), *Governing Europe* (Oxford University Press 2003) 300.

In accordance with the capture theories, the present study raises the possibility that ETSI's institutional structure is susceptible to capture by its private members. Everson et al voiced such concerns in their report presented to the Commission, underscoring that:

Capture is also a problem for agencies, but with self-regulation, regulatory capture is there from the outset. Precisely to reduce this risk, the European standardisation organisations are required to allow all interested parties to participate in standard setting. However, this requirement may not be sufficient to give adequate representation to diffuse, *ill-organised*, interests. Public regulatory agencies may provide better protection of such interests than an SRO.²⁹

Consequently, the autonomy of the organisation and the complete reliance for decision-making on the members amplifies the room for capture. First, ETSI weighted voting system provides the leeway for ETSI members to materialise their self-interests. Ellis expresses such concerns about the weighted voting system arguing that: “[t]he demonstrated result is control through the weighted voting by a select group of telecommunications operators.”³⁰ Second, consensus could be used by some members to delay the standardisation process until one “side concedes or withdraws to the benefit of the other.”³¹ Further, despite the principle of consensus, the participation of dominant companies in standard setting could create a legitimacy gap. Also, the weighted voting raises concerns of discrimination and bias in decision-

²⁹ Everson M and others, ‘The Role of Specialised Agencies in Decentralising EU Governance: Report Presented to the Commission’ (1999) 1, 33.

³⁰ Ellis W, ‘Intellectual Property Rights and High Technology Standards in Standards Policy for Information Infrastructure’ in Kahin B and Abbate J eds, *Standards Policy for Information Infrastructure* (MIT Press 1995) 452.

³¹ Delimatsis P, ‘Relevant international standards’ and ‘recognised standardisation bodies’ under the TBT Agreement’ in Delimatsis P (ed) *The Law, Economics and Politics of International Standardisation* (Cambridge University Press 2015) 111; Farrell J and Saloner G, ‘Coordination Through Committees and Markets’ (1988) 19 *The RAND Journal of Economics* 235.

making. Discrimination against members with and under-representation of a lower-scale membership (small and medium firms (SMEs)) can occur when committees must resort to the voting system.³² For example, Egan points out that due to their economic and expertise deficiency, SMEs are less likely to “influence the pace and direction of standardisation at the European level.”³³

Arguably, with the weighted voting there is an increased likelihood of individual members or a collective of members, by acquiring or combining a great number of units of votes, to either influence or shift the result of decision-making. In this way, ETSI members could capture standard setting by influencing the selection and development of certain standards in order to increase the probability of a standard sponsoring their technologies.³⁴

Previous research has indicated the association between the participation of SEP owners in formal standard setting and the strategic behaviour as well as the ability to influence formal standardisation.³⁵ The following section draws together and reviews a number of empirical studies that identify key determinants for participation in formal standard setting of ETSI.

³² For a discussion on the repercussions of under-representation of SMEs in standard setting see 4.2.2.3.1.

³³ Egan M, 'Regulating European Markets: Mismatch, Reform and Agency' (ProQuest Dissertations Publishing 1996) 285.

³⁴ Axelrod R and others, 'Coalition Formation in Standard-Setting Alliances' (1995) 41 *Management Science* 1493.

³⁵ Weiss MBH and Sirbu M, 'Technological Choice in Voluntary Standards Committees: An Empirical Analysis' (1990) 1 *Economics of Innovation and New Technology* 111; Simcoe, T. 'Delays and de jure Standards: What Caused the Slowdown in Internet Standards Development?' (2004) University of Toronto.

4.2.2.3 Key Determinants of Participation in Pre-Standardisation

A growing empirical literature has examined the determinants of the firms' participation in the selection and pre-standardisation process of wireless telecommunication standards including that of ETSI and 3GPP based on declared SEPs.³⁶ The empirical findings further suggest some of the drivers of industry participants and the factors of technological evolution. The results show that the technology contributors seek to influence the development of standards based on their business strategies, their IPR assets, and the strategic positioning of their patent portfolios in the market to sustain or enhance their market power. Before proceeding to examination of these studies, it is necessary to discuss the under-representation of the SMEs in the pre-standardisation process in contrast to the participation of large firms. This will contribute to understanding how large companies due to their insurmountable market power can influence or even control the standard setting process.

³⁶ Rysman M and Simcoe T, 'Patents and the Performance of Voluntary Standard-Setting Organizations' (2008) 54 *Management Science* 1920; Layne-Farrar A, 'Innovative or Indefensible?: An Empirical Assessment of Patenting within Standard Setting' (2011) 9 *International Journal of IT Standards and Standardization Research (IJITSR)* 1; Pohlmann T, Neuhäusler P and Blind K, 'Standard Essential Patents to Boost Financial Returns' (2015) 46 *R&D Management* 612; Berger F, Blind K and Thumm N, 'Filing Behaviour Regarding Essential Patents in Industry Standards' (2012) 41 *Research Policy* 216.

4.2.2.3.1 Under-Representation of SMEs

The operations of the firms heavily depend on a network influence and information exchange.³⁷ This tactic also applies in ICT standardisation. Strategic networking, influencing, and lobbying is an inherent part of the standardisation activities for large firms, though, there are numerous barriers to SMEs preventing them from participating in standard setting and using standards. For example, lack of awareness, expertise, and financial resources are among the barriers that SMEs encounter over the course of the standardisation process.³⁸

The Commission identified the under-representation of SMEs in standardisation activities as a fundamental issue.³⁹ The revision of the Regulation on European Standards 1025/2012, which comprises the current backbone of the legal framework for standardisation, was adopted in order to expand the participation of actors in standard setting.⁴⁰ This included the overhauling of the standardisation process with the integration of societal stakeholders and SMEs under the formal European standardisation system. Regulation 1025/2012 in recital 21 reiterated the problem of SME under-representation and attempted to tackle it with measures to strengthen SMEs'

³⁷ This has been argued in a study conducted by Rosenkopf and Tushman. See Rosenkopf L and Tushman ML, 'The Coevolution of Community Networks and Technology: Lessons from the Flight Simulation Industry' (1998) 7 *Industrial and Corporate Change* 311.

³⁸ For a detailed study on the barriers that SMEs face see European Commission, 'Using Standards to Support Growth, Competitiveness and Innovation' (2014) 1, 29 available at <https://publications.europa.eu/s/lo08> accessed on 1 September 2019.

³⁹ European Commission, Staff Working Paper 'Executive Summary of the Impact Assessment Accompanying the document Proposal for a Regulation Of The European Parliament And Of The Council on European Standardisation and amending Council Directives 89/686/EEC and 93/15/EEC and Directives 94/9/EC, 94/25/EC, 95/16/EC, 97/23/EC, 98/34/EC, 2004/22/EC, 2007/23/EC, 2009/105/EC and 2009/23/EC', SEC (2011) 672 final, 1.6.2011.

⁴⁰ European Commission, Communication on 'A strategic vision for European standards: Moving forward to enhance and accelerate the sustainable growth of the European economy by 2020' COM (2011) 311 final, 1.6.2011.

role in standard setting.⁴¹ Article 6 of the Regulation reinforces the accessibility of SMEs to standard setting by providing economic and procedural mechanisms to facilitate and encourage their participation in national standardisation bodies.⁴² For example, Article 6 dictates that SMEs be granted free access to standardisation activities and draft standards as well as that special or reduced fees for standards be provided.

Despite this legislative effort to invigorate the SMEs' involvement in standard setting, the results of a recent report, undertaken for the European Commission, show that the participation of SMEs in standard setting is yet underwhelming.⁴³ The most important result is that 42% of the SME respondents believed that the objective of inclusiveness in the standardisation process was not fulfilled.⁴⁴ The study clearly indicates that the aforementioned barriers prevent the effective participation of SMEs. It also highlights that “[o]verall, it appears that—although big players consider the system to involve the right stakeholders— “huge minorities” [including SMEs] are still not correctly represented (in terms of participation and influence) within the system.”⁴⁵ What is more, the Secretary-General of the European Association of Digital SMEs, Sebastiano Toffaletti, expressed such concerns stating that standard setting is more in line with the needs of the multinational companies and

⁴¹ Regulation 1025/2012 of the European Parliament and of the Council on European Standardisation, [2012] OJ L 316/12.

⁴² Ibid, Article 6.

⁴³ Ernst & Young, *Independent Review of the European Standardisation System: Final Report* (2015).

⁴⁴ Ibid 77. The study also provides key recommendations for the effective participation of SMEs in standard setting, namely raising awareness through simplified guidelines for participation; building and improving technical knowledge; and targeted financial support to facilitate international participation. See *ibid* 126.

⁴⁵ Ibid 113.

not SMEs' needs.⁴⁶ He further highlighted that the costs of testing and manufacturing standard-compliant products are prohibitive for SMEs whereas larger companies are able to subsidise such costs. Lastly, Sebastiano Toffaletti underscored that the selection of standards should favour SMEs, since harmonised standards can be mandatory for manufacturers to comply with EU legislation. This statement implies that mostly, if not only, top industry players mould the future of standards, those who have the resources, expertise, and power to actively represent their interests in the standardisation process.

In addition to the barriers that SMEs encounter, patent strategies create another impediment to SMEs' active participation in the standardisation process. Bekkers identified five types of strategic patenting in the pre-standardisation phase:⁴⁷ 'general architecture patenting strategy'⁴⁸; 'minefield patenting strategy'⁴⁹; 'non-disclosure patenting' and the 'misleading patent applications'⁵⁰; and 'trade secret strategy'.⁵¹ These strategies do not remarkably differ from the patent strategies for non-

⁴⁶ Toffaletti S, 'European SMEs and Standards | ASTM Standardization News' (2019) available at <https://www.astm.org/standardization-news/?q=first-person/european-smes-and-standards-ma16.html> accessed on 1 September 2019.

⁴⁷ Bekkers R, *Mobile Telecommunications Standards: GSM, UMTS, TETRA, and ERMES* (Artech House 2001) 228-229.

⁴⁸ The 'general architecture patenting strategy' refers to the patenting of the architectural design of system rather its specifications.

⁴⁹ The 'minefield patenting strategy' is where minor components of the technological design are patented to make it harder for the competitors to bypass.

⁵⁰ Patent applicants may opt for a combined strategy to escape the risk of exposing their technological inventions to the competitors. The 'non-disclosure patenting' and the 'misleading patent applications' strategies can take place in the patent application phase where patent applicants file technologies to lead the competitors away from their core technologies or research while concealing their key technological advancements with a non-disclosure strategy.

⁵¹ The last strategy that Bekkers refers to is the 'trade secret strategy' where despite the increased research concerning a standard, no patenting occurs concealing technological know-how from competitors.

SEPs. In any case, all these strategies require resources that SMEs normally do not have.

This subsection has discussed the under-representation of SMEs in EU standard setting. It has delineated the barriers that SMEs encounter in participating in EU standard setting, both importantly indicating that SMEs have lesser power compared to large, multinational, companies to influence the standardisation process. In this respect the standardisation process is a process that is driven primarily by big tech companies who select standards that do not favour SMEs. As will be shown in the next chapter, this creates further impediments to their participation in standard setting that the Commission has attempted to correct. The next subsection examines the factors of participation in the pre-standardisation process based on empirical studies. The purpose of this examination is to identify key parameters and drivers of technology contributors that can be subsumed under strategic patenting and behaviour.

4.2.2.3.2 Empirical Studies on Strategic Patenting & Participation

The strategic behaviour, including strategic patenting, of SEP holders has evolved over time with market power and concentration not only playing a pivotal role but also determining successful inclusion and monetisation of SEPs. This is certainly true in the case of GSM. In their case study of strategic alliances in GSM industries, Bekkers et al identified that the ownership of SEPs and alliance networks

affect market structure and market shares.⁵² According to their findings, five companies, i.e. Ericsson, Nokia, Siemens, Motorola, and Alcatel, dominated and controlled the GSM standard market with more than 85% of the market (worth more than 100 billion US dollars).⁵³

Motorola's particularly powerful position was found to be due to the strong development of a SEP portfolio in the GSM standard (owning nearly half of the essential patents) as well as its aggressive and non-cooperative approach.⁵⁴ At that time Motorola refused to become a signatory of the GSM Memorandum of Understanding terms,⁵⁵ which required the enforcement of royalty free conditions.⁵⁶ Instead it opposed to such IPR licensing restrictions and followed a non-cooperative approach pursuing the strategic licensing of its SEPs based on bilateral agreements.⁵⁷ In par-

⁵² Bekkers R, Duysters G and Verspagen B, 'Intellectual Property Rights, Strategic Technology Agreements and Market Structure: The case of GSM' (2002) 31 *Research Policy* 1141, 1159.

⁵³ Ibid.

⁵⁴ For further insights about Motorola's proprietary approach in the involvement and licensing of GSM standards see Pelkmans J, 'The GSM Standard: Explaining a Success Story' (2001) 8 *Journal of European Public Policy* 432.

⁵⁵ GSM Association, 'Memorandum of Understanding on the Implementation of a Pan European 900 MHz Digital Cellular Mobile Telecommunications Service by 1991' (1987) available at http://www.gsm-history.org/fileadmin/user_upload/GSM_MoU/GSM_MOU_1987.pdf accessed on 1 September 2019.

⁵⁶ Haug T, Dupuis P, and Temple S, 'The Agreement on the Concepts and the Basic Parameters of the GSM Standard (mid-1982 to mid-1987)' in Hillebrand F (ed) *GSM and UMTS: The Creation of Global Mobile Communication* (John Wiley & Sons 2001) 44-45; Failli R, Schmitt G, Foxman A, Blikrud P, Toepfer A, Gießler M and Lilly N, 'The Contribution of the GSM Association to the Building of GSM and UMTS' in Hillebrand F (ed) *GSM and UMTS: The Creation of Global Mobile Communication* (John Wiley & Sons 2001) 485.

⁵⁷ Iversen EJ, 'Standardization and Intellectual Property Rights: Conflicts between Innovation and Diffusion in New Telecommunications Systems' in Kai J (ed) *Information Technology Standards And Standardization: A Global Perspective* (Idea Group Publishing 2000) 95.

ticular, Motorola achieved that through the strategic setup of selective cross-licensing agreements with leading companies, and alliances with other suppliers of base stations, such as Siemens.⁵⁸ Therefore, the study drew the conclusion that:

By using the negotiation power that came with its patent portfolio, Motorola could dictate its licensing conditions to all firms. The company thus imposed a market structure by conducting exclusive cross-license agreements with a selected number of other parties on the market. These parties were selected because their IPRs were valuable to Motorola (not only essential patents, but also others), or because their product line complemented that of Motorola. Also Motorola took the position of firms in the alliance network into account when selecting its cross-licensing partners (Ericsson). [...] The play with the essential GSM IPRs, and the strategy of Motorola in particular, appears to have dramatically changed the standardization processes in the telecommunications industry.⁵⁹ (emphasis added)

Motorola, thus, through the strategic development and licensing of SEPs penetrated the European market and became one of the leading firms in the development of the GSM standard. Bekkers et al pointed out that the tension created by the sharp negotiations of SEP licensing likely negatively affected the public interest of standard setting.⁶⁰ This study contributes to the literature that highlights the strategic importance of SEPs and the power that they confer to their owners not only to guide standard setting but also to the licensing of SEPs by virtue market position and power.

⁵⁸ Supra note 57 in Bekkers et al 1158.

⁵⁹ Ibid 1159-1160.

⁶⁰ Ibid.

Another substantial analysis of the significance of such firms' strategic behaviour to influence the formal standardisation is found in Leiponen's study: 'Competing Through Cooperation: The Organization of Standard Setting in Wireless Telecommunications'.⁶¹ This makes an interesting contribution concerning the correlation between the formulation of 3GPP standards with the participation of firms in other technical industry consortia, private alliances, and standard setting committees. The study identified that large firms, as opposed to small ones, had a greater impact on the formulation of 3GPP standards by virtue of their consortium activities external to the formal standard setting process.⁶² The evidence from this study suggests that the leading equipment firms used consortia to promote their self-interests. It was found that such firms' external networking activities (e.g. participation, negotiation, and aligning positions on technical features with peers) had the ability to significantly influence formal standard setting.⁶³

In a related study, Bar and Leiponen provided a further explanation of the strategic involvement of 44 member firms of the Radio Access Networks in the cooperative standardisation of 3GPP.⁶⁴ The development of 3GPP technical specifications took place through working group proceedings where participants exchanged information of upcoming technologies and proposed specific technical features, known as work-items. Building on previous studies, which showed that market

⁶¹ Leiponen AE, 'Competing Through Cooperation: The Organization of Standard Setting in Wireless Telecommunications' (2008) 54 *Management Science* 1904.

⁶² *Ibid* 1917.

⁶³ *Ibid* 1917.

⁶⁴ The top five firms were Ericsson, Siemens, Nokia, Motorola, and Nortel Networks. Bar T and Leiponen A, 'Collaboration and Networking in Cooperative Standard Setting' (2009) available at <http://www.cerna.mines-paristech.fr/Donnees/data04/485-BarLeiponen09Nov25.pdf> accessed on 1 September 2019.

power and IPRs are two factors that enable firms to influence the standardisation process, the study was premised on the hypothesis that the participation of the firms in work-item projects relies heavily on the desire to maximise private payoff.

After analysing 62 work items and testing the committee size, the IPR assets (including essential patents) held by the committee members, and the ‘technological distance’ between the committee members, the study argued that information exchange and access to competitor’s complementary technological (R&D) assets were the key determinants of the firms to participate in the work item committees.⁶⁵ The results of the study suggested that the “firms seek to improve their positions in an inter-firm (social) network” within the cooperative environment of standard setting committees “where participants complement, rather than compete with, one another.”⁶⁶ It pointed out that large firms have a better opportunity to reinforce their dominance through central network positions.⁶⁷ Further, the most striking result to emerge from the dataset of this study is that the effects of network connections were considered to be more significant compared to the IPRs coupled with market power.⁶⁸ These results add to the premise that networking activities play a role important to the standard setting outcome with large firms deriving more considerable benefits from such activities over smaller ones.

⁶⁵ Ibid 15.

⁶⁶ Ibid 26 – 27.

⁶⁷ Ibid.

⁶⁸ Ibid 27.

Another study, conducted by Bekkers et al., investigated the determinants of claims of a patent essential for the 3G standard W-CDMA.⁶⁹ The study used a database which consisted of 18,738 patents declared to ETSI, from which 7,090 patents were found irrelevant to the 3G standard and, therefore, were excluded.⁷⁰ Premised on the idea that the forward patent citations “are systematically correlated with the economic value or the industrial importance of patents”,⁷¹ it reveals that patents of high and low technical value were declared essential based on the frequency of forward patent citation.⁷² It highlights that strategic involvement in the standard setting is a significant determinant with regard to claims of essentiality of low technical value patents due to the voting weight system in ETSI and the active participation in the standards drafting process.⁷³ The study emphasises that:

[...] participants still systematically influence the content of the standard *in the direction of their own patented technologies, valuable or not*. [...] Current decisions concerning the inclusion of specific patents in a standard are made in relatively small technical groups, where it is likely (and perhaps unavoidable) *that reciprocal favours are granted—e.g. if you allow me to include a trivial patent, I will allow you to do likewise*.⁷⁴ (emphasis added)

This study provides a crucial insight in respect of the strategic participation of firms in standard setting to sponsor their technologies and claim essentiality even when

⁶⁹ Bekkers R, Bongard R and Nuvolari A, 'An Empirical Study on the Determinants of Essential Patent Claims in Compatibility Standards' (2011) 40 Research Policy 1001.

⁷⁰ Ibid 1005.

⁷¹ Ibid 1003.

⁷² Ibid 1012.

⁷³ Ibid.

⁷⁴ Ibid 1013.

their patents are not technically significant. The study evidences that the participation plays a more vital role in the standard drafting process than the technical importance of a patented technology to become essential.

In a more recent but complementary study, Kang and Bekkers investigated the standardisation strategies of the firms that participate in the pre-standardisation period to obtain the status of essentiality for their patents.⁷⁵ In order to test the hypotheses,⁷⁶ the authors collected data from 77 meetings that led to the shaping of W-CDMA and LTE standards, covering a period of over 12 years, where 939 individual participants attended and submitted over 14,000 patents, of which 988 were claimed essential.⁷⁷

The study modelled three pre-standardisation phases to test whether there is a cyclic pattern in filings: pre-meeting period, meeting, and idle (i.e. the periods in-between the meetings).⁷⁸ Results showed that not only there was a peak in preliminary patent filings during the pre-meeting period but also that there was an increased likelihood for those patents to be included into the standard, and thus become essential, as opposed to those that were filed during the standardisation meetings.⁷⁹ In contrast, the findings indicated that there was a negative relationship between the citation performance of the claimed essential patents and the pre-meeting

⁷⁵ Kang B and Bekkers R, 'Just-in-Time Patents and the Development of Standards' (2015) 44 *Research Policy* 1948.

⁷⁶ *ibid* 1952.

⁷⁷ *ibid* 1953.

⁷⁸ *ibid*.

⁷⁹ *ibid* 1954.

period.⁸⁰ Therefore, essential patents filed before the standardisation meetings received a lower citation score, suggesting that these patents are of inferior technical merit.

The authors, further, coined the strategic inclusion of patents filed during the pre-meeting period as “just-in-time patenting”.⁸¹ Just-in-time patenting can take two forms. First, it can be an anticipatory patent filing strategy where the firms file patent applications before the standardisation meetings.⁸² With their contribution in those meetings, the firms attempt to influence and eventually include their patents into a standard so that they become essential. Alternatively, it can be a ‘on-the-spot’ patenting strategy whereby the firms adopt a wait-and-see stance (either attending or not the meetings).⁸³ Once the technical ideas are submitted to the meetings and electronically by the attendees/other firms, the firms file preliminary patents that cover or reuse the ideas demonstrated in these meetings.⁸⁴ Patents filed under of each ‘just-in-time patenting’ strategy receive fewer citations reflecting the lower technical importance of such patents. These results are consistent with that of Blind et al who claimed in their study that “the strategic interests of participants in standardisation processes can result in attempts to include more trivial patents, which do not necessarily improve the standard.”⁸⁵ The results of the study support the view

⁸⁰ *ibid* 1957.

⁸¹ *ibid*.

⁸² *Ibid* 1958.

⁸³ *ibid*.

⁸⁴ *ibid*.

⁸⁵ Blind K and others, *EU Study on the Interplay between Standards and Intellectual Property Rights (IPRs)* (Commissioned by the Directorate General for Enterprise and Industry of the European Commission, Fraunhofer Institute for Communication System, Dialogic, 2011) 1, 22. A more recent study

that ‘just-in-time patenting’ has a number of negative implications in the market and the standard setting. Importantly, it may be conducive to the patent holdup, higher prices, higher barriers to implementers and competition in the market.⁸⁶

Together these studies provide important insights into the strategic participation of the SEP holders in the pre-standardisation phase. The findings provide solid evidence of the heavy lobbying by and of the industry participants both inside and outside the formal standardisation proceedings. They also show that strategic involvement of SEP holders in standard setting seeks the inclusion of patents as essential despite being bereft of technical quality.⁸⁷ The increasing importance of wireless telecommunication standards in the market has driven the industry participants to use strategically their patents to enter or reinforce their dominance in the standard market.⁸⁸ These findings also contribute to the understanding of the under-representation of SMEs in the (pre-)standardisation process. The strategic involvement

(2016) provides evidence that declared essential patents receive “a number of forward citations between 204% and 289% of non-declared ones.” Yet, the study clarifies that their findings are based on certain parameters, i.e. “whether the owner is an entrant or an incumbent firm and whether the invention is protected through an old or recent patent filing, that is previously developed and filed before the standardization process or previously developed, shaped during the standard definition and filed right before the declaration.” Caviggioli F and others, 'Patenting Strategies and Characteristics of Declared Inventions in the Long-term Evolution Standard' (2016) 46 R&D Management 664, 672.

⁸⁶ Supra note 75 in Kang B and Bekkers R 17-18.

⁸⁷ Based on the study of Rysman and Simcoe, with the declaration of a patent, its value increases receiving “twice as many citation rates” compared to non-essential patents of a given standard. See Rysman M and Simcoe T, 'Patents and the Performance of Voluntary Standard-Setting Organizations' (2008) 54 Management Science 1920, 1932; see also Verbruggen P, 'Tort Liability for Standards Development in the United States and European Union' in Contreras JL (ed), *The Cambridge Handbook of Technical Standardization Law: Further Intersections of Public and Private Law*, vol 2 (Cambridge University Press 2019) 60.

⁸⁸ Bekkers and West in their comparative study between GSM and UMTS provided that there was a threefold increase of SEP holders and eightfold increase in patents. Despite the increase in SEPs, the ownership was highly concentrated between incumbents. See Bekkers R and West J, 'The Limits to IPR Standardization Policies as Evidenced by Strategic Patenting in UMTS' (2009) 33 Telecommunications Policy 80, 92-93.

and patenting (e.g. just-in-time patenting) of the large firms in the standardisation process act as another barrier against the active involvement of SMEs. Without being equipped with the tools to compete on an equal footing, SMEs have lesser opportunities to actively participate and influence the process. As a result, standardisation becomes a process where the few determine its fate with restrictive participation.

Further, these findings provide empirical confirmation that standard setting participants drive the process away from the public interest. The above studies support the conclusion that the strategic patenting implies that industry participants are highly driven by self-interests to market their SEPs and strive to influence the pre-standardisation process. Their strategies of controlling the pre-standardisation process to shape the outcome could be construed as an act of manipulation comprising ex ante opportunism. In light of the theories of capture, these tactics may amount to capture and conflict with the public interest in standard setting. This evidence corroborates the second parameter of the tripartite capture model. The next section tests the last prong of the capture model by scrutinising the development and adoption of ETSI IPR Policy.

4.2.3 The Controversial Development of ETSI IPR Policy

Turning to the last parameter of Carpenter's tripartite capture model, this section endeavours to show how industry participants could manipulate the regulatory process of standard setting according to their interests. As Chapter 2 indicated, the ETSI Directives require for standards to be accessible. Returning to the tension between standards and patents here, ETSI, in order to ensure the pro-competitive character of standard setting, balances the interests of both technology contributors

and standards implementers via its IPR policy. In this regard, the ETSI IPR Policy requires the licensing of essential patents on FRAND terms. This requirement has a dual goal: it permits the SEP holders to receive adequate returns for their contribution in R&D and investment in standard setting while safeguarding reasonable access to standards for the implementers. Although the FRAND licensing regime is one of the fundamental obligations with which ETSI members should comply, the ETSI IPR Policy eschews any definition of those terms.

A review of the history of ETSI's IPR Policy formulation, however, reveals the tension and conflict that emerged at a time when ETSI was trying to shape its policies. ETSI has been charged with more responsibility for standards as deliverables over time at the initiative of its members to cope with the swift development of technologies in the ICT sector.⁸⁹ In light of this initiative, the participation of numerous technology contributors in the standardisation process within ETSI's remit, resulted in the inclusion of a great number of essential patents. This in turn raised

⁸⁹ European Commission, General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association, 2003/C 91/04, 28 March 2003, 8.

the issue of availability of these essential patents in the implementation of standards.⁹⁰ The manifested tension between IPRs and standardisation can be traced back to the technical development of the heavily patented GSM standard.⁹¹

In early 1990s, ETSI was striving to elaborate its 'IPR Policy and Undertaking' to enable the production and availability of its standards as well as to resolve any potential tension that could emerge between essential patents and standard setting.⁹² In 1993, the proposed IPR Policy and Undertaking was adopted with 88% positive votes by the General Assembly.⁹³ ETSI then sought a negative clearance under the then competition law Article 85, EC Treaty (now Article 101, TFEU) for this

⁹⁰ Bekkers R, Verspagen B and Smits J, 'Intellectual property Rights And Standardization: The Case Of GSM' (2002) 26 *Telecommunications Policy* 171; supra note 57 in Iversen EJ; Iversen EJ, 'Standardization and Intellectual Property Rights: ETSI's Controversial Search for New IPR-Procedures' (IEEE Conference on Standardisation and Innovation in Information Technology, Aachen, September 1999); Good D, 'How far should IP rights have to give way to standardisation: the policy positions of ETSI and the EC' (1992) *European Intellectual Property Review* 295; Good D, '1992 and Product Standards: A Conflict With Intellectual Property Rights?' (1991) *European Intellectual Property Review* 398.

⁹¹ Bekkers R and West J, 'The Limits to IPR Standardization Policies as Evidenced by Strategic Patenting In UMTS' (2009) 33 *Telecommunications Policy* 80; Supra note 69 in Bekkers R, Bongard R and Nuvolari A; Shurmer M, 'Telecommunications Standardization And Intellectual Property Rights: A Fundamental Dilemma?' (1995) 3 *StandardView* (New York, NY) 50; Wilkinson S, 'They're Stealing Our Diamonds: The Standards Assault on Patents' (1991) 8 *Revue Canadienne de Propriete Intellectuelle* 193; Sangoon Y and Taehyun J, *Co-evolution of Markets for Technology and Markets for Products in Mobile Telecommunication Standards: Examination of Essential Patents for GSM, WCDMA, and LTE Standards* (Proceedings of PICMET '14 Conference: Portland International Center for Management of Engineering and Technology; Infrastructure and Service Integration, 27-31 July 2014) 62; Blind K and Thumm N, 'Interrelation Between Patenting and Standardisation Strategies: Empirical Evidence and Policy Implications' (2004) 33 *Research Policy* 1583, 1584-85.

⁹² The European Commission, 'Notice Pursuant to Article 19(3) of Council Regulation No. 17 concerning case No. IV/35.006, ETSI Interim IPR Policy' OJ C76/5, 28.03.1995; See also Stasik EL, 'The Role of the European Commission in the Development of the ETSI IPR Policy and the Nature of FRAND in Standardization' in Bharadwaj A and others (eds), *Multi-dimensional Approaches Towards New Technology: Insights on Innovation, Patents and Competition* (Springer Singapore 2018) 77.

⁹³ Supra note 90 in Iversen EJ, 'Standardization and Intellectual Property Rights: ETSI's Controversial Search for New IPR-Procedures', 6.

‘agreement’ from the Commission.⁹⁴ In the midst of strong objections, a complaint was made before the Commission by the US ‘Computer and Business Equipment Manufacturers Association’ (CBEMA) and supported by the ‘Business Software Alliance’ (BSA), for alleged infringements of both Article 101 and 102 TFEU,⁹⁵ while numerous members threatened to pull out of the organisation.⁹⁶

The major dissension occurred with regard to two specific provisions proposed in the IPR Policy and Undertaking: first, that ETSI members “would agree in advance to allow their IPRs deemed ‘essential’ [...] for an ETSI standard, to be included in that standard, unless the IPR-owner had identified any IPR it wished to withhold within a certain period (six months) as of the date on which the Technical Committee had decided to include the draft standard in the ETSI work programme [...]”⁹⁷ – this obligation was also known as the reciprocal ‘licensing by default’ obligation; and second, the restriction of SEP holders to seek injunctive relief for alleged infringing uses.⁹⁸ Under the former, members/rightsholders were obliged to give an

⁹⁴ Supra note 92 OJ C 76/5; see also Bekkers R, *The Development of European Mobile Telecommunications Standards: An Assessment of the Success of GSM, TETRA, ERMES and UMTS* (Technische Universiteit Eindhoven 2001) 235.

⁹⁵ Complaint, *CBEMA v. ETSI*, No. IV-34.760 (Eur. Commission filed June 22, 1993); Supra note 91 OJ C 76/5 para 9.

⁹⁶ Supra note 90 in Iversen EJ; Dixon AN, ‘ETSI Complaint and the European Commission’s Communication on Standardization, The’ (1996) 1 *International Intellectual Property Law & Policy* 369.

⁹⁷ Supra note 92 OJ C 76/5 para 8; Bekkers R, *Mobile Telecommunications Standards: GSM, UMTS, TETRA, and ERMES* (Artech House 2001) 236; Ellis W, ‘Intellectual Property Rights and High Technology Standards in Standards Policy for Information Infrastructure’ in Kahin B and Abbate J eds, *Standards Policy for Information Infrastructure* (MIT Press 1995) 453; Park JH, *Patents and Industry Standards* (Edward Elgar Publishing 2010) 81; Bekkers R and Liotard I, ‘European Standards for Mobile Communications: The Tense Relationship between Standards and Intellectual Property Rights’ (1999) 3 *European Intellectual Property Review* 110, 121.

⁹⁸ ETSI/GA15 TD 25, § 13 (“The Signatory hereby undertakes not to seek an injunction against a Party in respect of any Essential IPR in respect of [enumerated situations].”); Sidak GJ, ‘The Meaning of FRAND, Part II: Injunctions’ (2015) 11 *Journal of Competition Law and Economics* 201, 220; Brooks RG and Geradin D, ‘Taking Contracts Seriously: The Meaning of the Voluntary Commitment to Licence Essential Patents on “Fair and Reasonable” Terms’, in Anderman SD and Ezrachi A (eds), *Intellectual Property and Competition Law: New Frontiers* 389 (Oxford Univ. Press 2011).

ex ante commitment to license their essential IPRs without exception to everyone who participated and signed up to the ETSI IPR Policy.⁹⁹ Against this background, CBEMA claimed that this provision of the proposed IPR Policy amounted to a compulsory licensing scheme infringing competition law.¹⁰⁰

The direct participation of private parties in ETSI had moved beyond European borders and interests of US market actors were also likely affected by those IPR provisions; they furiously objected to their implementation.¹⁰¹ In their article 'Interpreting and Enforcing the Voluntary FRAND Commitment', Brooks and Geradin underscored that: "[...] so serious was the dissent among the membership that the ETSI Technical Assembly Chairman warned that "other entities with simpler rules may have ambitions to take over ETSI work and ETSI could be out of business in five or ten years."¹⁰² Bekkers also highlighted that the matter took on political overtones: "[t]he U.S. government started a very intensive lobby to have the ETSI

⁹⁹ Dixon AN, 'ETSI Complaint and the European Commission's Communication on Standardization, The' (1996) 1 *International Intellectual Property Law & Policy* 369, 372; Smith GJ, *Internet law and Regulation* (Sweet & Maxwell 2007) 1197.

¹⁰⁰ *Supra* note 95 Complaint, *CBEMA v ETSI*.

¹⁰¹ As Egan points out: "American companies were concerned about the lack of influence in the European Telecommunications Standards Institute (ETSI), which opted for a standard known UMTS or CMTA. The dispute over influence has historical roots, since American companies did not originally adopt European-designated GSM standards in the 1980s, unlike most of the world, and have few GSM networks. Because American standards are different, European approval the singular standard within ETSI irked many US companies that did not want the European standard to become the singular one at the international level in preferred more flexibility and the international level with the International Telecommunications Union (ITU)." Egan M, 'Mutual Recognition and Standard Setting: Public and Private Strategies for Governing Markets', in Pollack MA and Shaffer GC (eds), *Transatlantic Governance in the Global Economy* (Rowman & Littlefield 2001) 186; Messmer Ellen, 'ETSI's Intellectual Property Rights Policy under Fire' (1993) 10 *Network World* 1, 29.

¹⁰² (ETSI/GA20(94)22 Rev.1 4); Brooks RG and Geradin D, 'Interpreting and Enforcing the Voluntary FRAND Commitment' 9 *Int J IT Stand Res* 1, 9.

IPR Policy annulled, and the policy became the subject of trade negotiations.”¹⁰³ Additionally, Iversen reported that:

“[t]his policy became the subject of trade negotiations between Kantor and Bangemann over which the idea of trade war loomed; the US Dept of Justice started to put together a case; while Clinton is reputed to have pressured the British Government into subtracting support for the policy through threats of moving certain industrial plants from the UK. At the same time, American embassies are said to have exerted pressure on certain voting parties to get them to withdraw support.”¹⁰⁴

The controversy about the ETSI IPR Policy raged unabated and loaded with political and governmental interests. Krechmer noted that there was a disparate stance in the standardisation approach between Europe and North America which justified the political interference of the latter in the European standardisation policy:

Standardization for cellular telephony, the new technology for wireless communications, was approached quite differently in North America and Europe. North America pursued a laissez-faire policy, letting the commercial organizations to do as they wished. This policy resulted in three competing cellular standards. The European Union pursued a single unified standard, GSM, for all EU countries. In Europe two equipment developers, Nokia and Ericsson, pulled far ahead of their largest competitor, Motorola, headquartered in North America. This occurred even though Motorola was initially a much larger wireless communications equipment manufacturer.¹⁰⁵

Additionally, the German Association for the Protection of Intellectual Property, also known as ‘GRUR’, outlined the political opposition to the adoption of ETSI IPR Policy and Undertaking in its report for the Commission’s Public Consultation on

¹⁰³ Supra note 47 Bekkers 238.

¹⁰⁴ Supra note 90 Iversen EJ.

¹⁰⁵ See Krechmer K, ‘Standardization and Innovation Policies in the Information Age!’ (2004) 2 International Journal of IT Standards & Standardization Research 49, 50.

“Patents and Standards” mentioning that: “the adoption of the ETSI IPR Policy and Undertaking led to a series of formal protests from a number of ETSI members. Moreover, controversial discussions at high political levels ensued, including a series of diplomatic incidents.”¹⁰⁶

The Commission expressed its concerns about the adoption of the ETSI interim IPR Policy and Undertaking.¹⁰⁷ Most importantly, in its open letter to CBEMA and ETSI, the Commission stressed that:

The “license by default system” [...] an undertaking pursuant to which IPR holders are deprived of their freedom to decide whether or not to grant licenses on their existing and future technology is restrictive of competition: it amounts to a mutual renunciation of gaining competitive advantages thanks to technical efforts and thereby deprives the participants of the incentive to develop new technologies [...]. Exemption under Article (81) (3) could not be contemplated if the lack of information [on the precise technological content of the standard before the public enquiry stage] makes it technically unfeasible to identify and withhold IPR. If it is technically possible, but financially burdensome to carry out meaningful searches, an exemption under Article (81) (3) could, however, be contemplated.¹⁰⁸

¹⁰⁶ See The German Association for the Protection of Intellectual Property (“Deutsche Vereinigung für gewerblichen Rechtsschutz und Urheberrecht e.V.”) ‘Comments submitted by the German Association for the Protection of Intellectual Property (GRUR) concerning the Commission’s Public Consultation on “Patents and Standards – A modern framework for standardisation involving IPR” (2015) text in note 54.

The political pressure by the United States can be clearly seen in the United States International Trade Commission 1993 report. See in the United States International Trade Commission, ‘The Effects of Greater Economic Integration within the European Community on the United States: Fifth Followup Report Investigation No. 332-267’ (1993) USITC Publication 2628 1, 43 and 44.

¹⁰⁷ It acknowledged the tension between IPRs and standardisation: “[t]he development and ultimate application of a given standard can be held up or even made impossible if the standard incorporates proprietary technology and the owner of that technology is not willing to make it available for third parties wishing to manufacture products complying with the standard.” *Supra* note 92 OJ C 76/5 para 6.

¹⁰⁸ Open Letter from the EC Commission to ETSI and CBEMA (Feb 1994) (text in Dolmans M, ‘Standards for Standards’ (2002) 26 *Fordham Int’l LJ* 163, 181).

It has been suggested that CBEMA abused the Commission's process and exploited competition law and that the Commission's position was due more to political pressure than the merits of competition law.¹⁰⁹ This study is in agreement with this view and it further posits that it is an indication of Commission's capture.

Subsequently, in light of the formal complaint to the Commission¹¹⁰ and political pressure, ETSI was forced to abandon its IPR Policy and Undertaking, and to adopt instead a more favourable IPR Policy for its members.¹¹¹ Interestingly, the General Assembly, thus, decided to abandon the proposed IPR Policy and Undertaking with the same percentage of 88% weighted majority vote of ETSI members that voted in favour before.¹¹² Essentially, the amended IPR Policy was based on the licensing conditions proposed by the Commission¹¹³ as well as the borrowed FRAND framework from the International Telecommunication Union (ITU), IPR policies that still comprise the backbone of ETSI's IPR policy today.

¹⁰⁹ Iversen asserted that: "Meanwhile, it was argued that the IPR controversy was damaging ETSI's legitimacy in the market. In general it should be noted that such a situation is serious for a relatively new SDO that is trying to establish itself in a quickly changing global market." See supra note 90 Iversen EJ at 7. See also Tuckett R, 'ETSI's IPR Policy: The Implications for Companies using European Telecoms Standards' (1993) 10 Patent World, 23-7.

¹¹⁰ The Commission never acted on the matter: "The issues raised by this complaint were never decided on formally by the Commission, in view of the fact that the undertaking and any references thereto in the policy were abandoned by ETSI's General Assembly of 22 and 23 November 1994 in order to achieve greater consensus amongst ETSI members, and the complaint subsequently withdrawn." See Supra note 92 OJ C 76/5 para 9.

¹¹¹ Specifically, ETSI was asked to adopt the ITU policy framework for IPRs, which incorporated the FRAND obligation. See Blind K and others, *Study on the Interaction between Standardisation and Intellectual Property Rights* (Fraunhofer Institute Systems and Innovation Research, Karlsruhe, 2002) 1, 197-198; Brooks R and Geradin D, 'Taking Contracts Seriously: The Meaning of the Voluntary Commitment to Licence Essential Patents on "Fair and Reasonable" Terms' in Anderman SD and Ezrachi A (eds), *Intellectual Property and Competition Law: New Frontiers* 389 (Oxford Univ. Press 2011).

¹¹² Supra 94 in Bekkers R at 239.

¹¹³ European Commission, 'Intellectual Property Rights and Standardization' COM (92) 445 final.

This section has demonstrated the strong industry lobbying and political opposition to the adoption of ETSI IPR Policy that could have required the scheme of reciprocal 'licensing by default'. Interpreting these facts with hindsight, primarily American companies were antithetical to the adoption of such rules, which subsequently influenced the political landscape and with a series of actions managed to stop the enactment of IPR policies that would not favour them. Indeed, standard setting is not only loaded with political decisions made by the Commission as to the regulation of technical specifications but also it entails political judgments made by the ESOs.¹¹⁴ This explains why the American companies so vigorously fought the adoption of policies that would have been against their interests, namely licensing terms of SEPs. Therefore, the analysis of the above satisfies the last prong of the tripartite capture model, showing the shift that ETSI IPR policy underwent to gratify industry's interests.

The next section will apply the three rationales of agency problem paradigm, namely information asymmetries, goal conflict, moral hazard, to establish the inter-capture of the principal of standard setting, namely the Commission. In the case where inter-capture is affirmed, the Commission should intervene to mitigate special interests and opportunistic behaviour of ETSI members that damage the co-regulatory process of standard setting, and, thereby, to prevent the intra-capture.

¹¹⁴ Schepel H, *The Constitution of Private Governance – Product Standards in the Regulation of Integrating Markets* (Hart publishing 2005) 256.

4.3 Diagnosing Capture of the Principal

Based on the analyses of theories of regulation discussed in the previous chapter, this section hones the agency theory and establishes justifications for the principal's regulatory intervention to curb capture. As has been noted, the purpose of the agency theory is to establish a more efficient principal-agent relationship by reducing the potential for agency problems.¹¹⁵ The agency theory model is based on three rationales that constitute the agency problem.¹¹⁶ First is that there must be information asymmetry. Second, there must be an inherent goal conflict in the principal-agent relationship. Both actors are considered to be self-interested, but it is assumed that the agent is behaving opportunistically towards the principal.¹¹⁷ Premised on these two assumptions, *ex ante* and *ex post* opportunism may arise in three different forms, namely adverse selection, moral hazard, and the holdup problem, constituting the third rationale.¹¹⁸

¹¹⁵ Eisenhardt KM, 'Agency Theory: An Assessment and Review' (1989) 14 *The Academy of Management Review* 57, 58.

¹¹⁶ Hesterly WS, Liebeskind J and Zenger TR, 'Organizational Economics: An Impending Revolution in Organization Theory?' (1990) 15 *Academy of Management Review* 402; Waterman RW and Meier KJ, 'Principal-Agent Models: An Expansion?' (1998) 8 *Journal of Public Administration Research and Theory* 173; Moe TM, 'The New Economics of Organization' (1984) 28 *American Journal of Political Science* 739; Pratt JW, 'Risk Aversion in the Small and in the Large' (1964) 32 *Econometrica* 122; Arrow KJ, *Essays in the Theory of Risk-Bearing* (North Holland Publishing 1971); Hendry J, 'Beyond Self-Interest: Agency Theory and the Board in a Satisficing World' (2005) 16 *British Journal of Management* S55, 57.

¹¹⁷ Also, theorists postulate that the principal is neutral to risk while the agent is more risk-averse than the principal. See *supra* note 115 in Eisenhardt KM, 60-61; Bergen M, Dutta S and Walker OC, 'Agency Relationships in Marketing: A Review of the Implications and Applications of Agency and Related Theories' (1992) 56 *Journal of Marketing* 1, 4; Radner R, 'Hierarchy: The Economics of Man-aging' (1992) 30 *Journal of Economic Literature* 1382, 1406.

¹¹⁸ Milgrom P and Roberts J, *Economics, Organization And Management* (International edn, Prentice-Hall 1992) 150; Williamson OE, *The Economic Institutions Of Capitalism: Firms, Markets, Relational Contracting* (Free Press 1985) 47; Barney JB and Ouchi WG, *Organizational economics* (1st edn, Jossey-Bass 1986) 439-440; Arrow KJ, *Essays in the Theory of Risk-Bearing* (North Holland Publishing 1971) 38; Petersen T, 'The Economics of Organization: The Principal-Agent Relationship' (1993) 36

As previously outlined, adverse selection is the result of *ex ante* opportunistic behaviour based on the information asymmetries rationale.¹¹⁹ The problem of moral hazard and holdup are *ex post* opportunistic behaviours. The former emerges when the principal is unable to monitor the actions of the agent who is pursuing its private goals at the expense of the principal's goals. As analysed at length in Chapter 3, the latter problem occurs when one party makes relationship-specific investments and gets locked into that relationship, whereas the other behaves opportunistically with hindsight.

Turning to the application of the agency problem in the context of standard setting, information asymmetries, the goal conflict in the agency relationship and moral hazard must be examined. The below section examines the three factors of the agency problem in the context of the Commission and ETSI (agency) relationship.

4.3.1 Information Asymmetries

Part of the agency problem is the information asymmetries integral to the agency relationship. The levels of information differ vastly between the technology contributors and regulators.¹²⁰ Because of their specialised knowledge, technology contributors have superior information and knowledge regarding production pro-

Acta Sociologica 277, 280-281; supra note 115 in Eisenhardt KM 61; Klein B, Crawford RG and Alchian AA, 'Vertical Integration, Appropriable Rents, and the Competitive Contracting Process' (1978) 21 *The Journal of Law & Economics* 297.

¹¹⁹ See Chapter 3, section 3.3.3.

¹²⁰ Blind K, Petersen SS and Riillo CAF, 'The Impact of Standards and Regulation on Innovation in Uncertain Markets' (2017) 46 *Research Policy* 249, 253.

cesses, technological opportunities and market trends, and the standardisation process itself.¹²¹ As shown in the previous section, technology contributors are primarily driven to include their patented technologies into standards to improve their position in the market. As a consequence of information asymmetries, adverse selection may arise including prior to the establishment of the agency relationship.¹²²

Information asymmetries arise in three forms and between different actors. In their first form, information asymmetries are noted between the technology contributors and the standard setter during the pre-standardisation phase. These stem from uncertainty about the true value and essentiality of patented technologies submitted to the ETSI working groups and committees for the selection of technologies that would form a standardised technology. In this scenario, the technology contributors have private information before the standard setting reaches the development and adoption stage. Particularly, technology contributors, who behave strategically, withhold information about the value, importance, and essentiality to a standard of their patented technologies while observing competing alternatives and bargaining with others.¹²³ Technology contributors, who behave strategically, thus, can evaluate the likelihood of their patented technologies acquiring the essentiality status, and can influence or collude with other contributors to mutually support each other's

¹²¹ Abbott KW and Snidal D, 'International 'Standards' and International Governance' (2001) 8 *Journal of European Public Policy* 345, 356.

¹²² Ruachhaus RW, 'Principal-Agent Problems in Humanitarian Intervention: Moral Hazards, Adverse Selection, and the Commitment Dilemma' (2009) 53 *International Studies Quarterly* 871, 872.

¹²³ Garcia DL, Leickly BL and Willey S, 'Public and Private Interests in Standard Setting: Conflict or Convergence' in (2005) 1, 16 available at <https://blogs.commonsgorgetown.edu/cctp-644-fall2015/files/2015/09/Wk2-Public-and-Private-Interests-in-Standard-Setting-Conflict-or-Convergence.pdf> accessed on 1 September 2019.

low-value patents during the selection stage.¹²⁴ In such an instance, the standard setter, ETSI, consequently, suffers from a primary level of adverse selection, by including in a standard trivial patents that are not meritorious enough to gain the status of essentiality. In contrast, technology contributors enjoy information asymmetries and benefit from the strategic patent inputs.¹²⁵

Building on the above, a SEP holder, whose low-value patent was selected and became part of a standard, can charge extraordinary royalty fees.¹²⁶ This constitutes the second form of information asymmetries. In such an instance, the SEP holder can implement its opportunistic strategy against a SEP user as the latter lacks information regarding the actual value and essentiality of the SEP to the standard. A SEP user is unable to identify the true value of the SEP and whether the licensing rate requested by the SEP holder is within the ambit of FRAND, and suffering from such information asymmetries is in a disadvantageous negotiating position.

Information asymmetries, in their third form, arise between the principal and the agent. In this scenario, the regulator, here the Commission, encounters a higher level of information asymmetries about the technologies comprising a standard. More specifically, while the Commission requests the development of harmonised standards through mandates, the onus is on ETSI and its committees to select the technical specifications of a standard. However, the Commission has no, or little

¹²⁴ *Supra* note 69 in Bekkers R, Bongard R and Nuvolari A at 1013.

¹²⁵ Baron J and Delcamp H, 'Strategic Inputs into Patent Pools' (2010) 1 available at <https://ssrn.com/abstract=1641265> accessed on 1 September 2019.

¹²⁶ Ernst D, 'Standard-Essential Patents within Global Networks-An Emerging Economies Perspective' (2016) 1, 6 available at <https://ssrn.com/abstract=2873198> accessed on 1 September 2019.

knowledge compared to the market actors, who participate in formal standardisation activities and, thereby, possess greater knowledge about the supply and demand sides of technological frontier.¹²⁷

Accordingly, the adverse selection problem occurs when the Commission is unaware that trivial patents make their way into a standard because of strategic behaviour by technology contributors. This is adverse selection at a secondary level as opposed to the primary adverse selection which occurs within the realm of ETSI during the selection stage. With this secondary level adverse selection, the Commission may order the adoption of a standard that would result in higher innovation costs as well as the inclusion of inferior and suboptimal technologies functioning as devices of opportunism. This problem also links to the moral hazard described later in this Chapter.

4.3.2 Goal Conflict

The core of the agency relationship between the Commission and ETSI is built on the delegation of the development of harmonised standards that encapsulates the principles of EU public policy and public interest, which coincides with the standardisation policy of the Commission.¹²⁸ In particular, the Commission, via standardisation, aims at the smooth functioning of the Single Market by keeping it accessible to all market actors, free from detrimental effects in competition. On the

¹²⁷ *Supra* note 120 in Blind K, Petersen SS and Riillo CAF, 253.

¹²⁸ See 3.4.2.

other hand, ETSI seeks to enhance its role in standard setting and “[...] to be recognized as the leading standardization organization for high quality and innovative [...] ICT standards that fulfil global and European market needs.”¹²⁹ Although, theoretically, ETSI’s driving force is to produce such standards with high adoption rates, it overlooks the strategic practices of its members.

ETSI’s goals are seemingly in agreement with the EU regulatory framework and enable the realisation of the European technical harmonisation in the ICT sector. At the same time, however, it is a body that strives to strengthen and maintain its position among other SSOs.¹³⁰ ETSI fundamentally depends on its members creating a “hub” of technology contributors who are willing to submit their patented inventions with their participation to the ETSI standardisation process. This has a double result. While, on the one hand, it supports the European standardisation and public policy through the development of standards, it contributes to the growth and the expansion of ETSI as an SSO on the other.

The increasing number of consortia and SSOs in the competitive market for standards development enables forum shopping for technology contributors.¹³¹ Therefore, as Lerner and Tirole note, SSOs strive to attract as many contributors as possible through the adoption of lenient policies.¹³² In light of this, it can be posited

¹²⁹ ETSI, ‘The ETSI Long-Term Strategy’ available at https://www.etsi.org/images/files/Brochures/ETSI_LTS%20Brochure_WEB.pdf accessed on 1 September 2019.

¹³⁰ *ibid* 10.

¹³¹ Glader M, ‘Open Standards: Public Policy Aspects and Competition Law Requirements’ (2010) 6 *European Competition Journal* 611, 634; Cargill C and Bolin S, ‘Standardization: a Failing Paradigm’ in Greenstein S and Stango V (eds), *Standards and Public Policy* (Cambridge University Press 2006) 309.

¹³² Lerner J and Tirole J, ‘A Model of Forum Shopping’ (2006) 96 *The American Economic Review* 1091, 1102; Tsai J and Wright JD, ‘Standard Setting, Intellectual Property Rights, and the Role of Antitrust in Regulating Incomplete Contracts’ (2015) 80 *Antitrust Law Journal* 157, 161.

that ETSI is inhibited from adopting meaningful policies against opportunistic members in order not to discourage the participation of the industry participants and thereby become less appealing. Based on anecdotal evidence, even new consortia are reluctant to give a meaning to FRAND terms to not hamper the participation of members opposed to such definitions.¹³³ This could explain ETSI's non-involvement in the newly adopted core principles and approaches for best practice in licensing SEPs by CEN/CENELEC, as previously discussed in Chapter 2.¹³⁴

One of the most pressing problems here is that ETSI members' opportunism drives ETSI away from the standardisation goals of the Commission/principal. This, as discussed earlier, is to "[...] spur innovation, economic growth and improvements in daily life for both citizens and businesses."¹³⁵ The public interest is, therefore, embedded into the Commission's standardisation policy. However, to the degree that ETSI members seek to satisfy their self-interest via standardisation they commensurately move ETSI away from and encroach on the public interest principle. Under a scenario where the public interest is absent from the standardisation process, ETSI would be a forum of private actors dominated by brute market power with individual economic interests. Therefore, standards should remain accessible to everyone to facilitate the public policy objectives that aim for market growth and the consumer welfare generating optimal results generally. Therefore, even subtle

¹³³ See text in fn 134 in Bekkers R and Updegrove AS, *IPR Policies and Practices of a Representative Group of Standards-Setting Organizations Worldwide* (Committee on Intellectual Property Management in Standard-Setting Processes National Research Council, Washington, DC, 2013) 1, 103 available at http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_072197.pdf accessed on 1 September 2019.

¹³⁴ See 2.3.2 for the discussion on CEN/CENELEC Workshop Agreement.

¹³⁵ The European Commission, 'A Digital Agenda for Europe', COM(2010)245 final, 19.5.2010, 1, 3.

deviation of ETSI from the public policy and public interest principle triggers goal conflict as the agency problem illustrates.

4.3.3 Moral Hazard

According to the agency theory, moral hazard is another potential problem deriving from information asymmetries between principal and agent. Here the agent can act without regard to risk as the principal is likely unable to monitor the actions of agents' in misappropriating their information advantage throughout the three phases of the standardisation process, i.e. during pre-standardisation, standards development, and post-standardisation/adoption. Particularly likely is the lack of oversight during the pre- and post-standardisation process, as explored below.

The pre-standardisation process kick-starts with the development of technical solutions for identified and compelling technical problems.¹³⁶ Traditionally, that process requires the formation of technical specification groups and working groups that deal with the different layers of the technical solution. Submitted technical contributions lead to the creation of technical specifications; the layered collection of technical specifications is shaped into standards. Over this very technical pre-standardisation process, however, the principal's oversight is absent. This is problematic when coupled with behaviour by technical contributors seeking to implement their strategic patenting in standard setting by using the information asymmetries, thus affirming the moral hazard premise.

¹³⁶ For a more detailed analysis of the standardisation process see Gupta K, 'How SSOs Work: Unpacking the Mobile Industry's 3GPP Standards' in Contreras JL (ed) *The Cambridge Handbook of Technical Standardization Law: Competition, Antitrust, and Patents* (Cambridge University Press 2017) 33-42.

Another notable potential for moral hazard is during the post-standardisation/adoption phase of standard setting. Even though SEP holders commit irrevocably to FRAND terms prior to the adoption of a standard, in agreement with the letter of the standard setting principles, there is the risk that they will subsequently abandon these commitments and act solely in their interests. There is no oversight mechanism for the licensing negotiations between SEP holders and users. Although the licensing negotiations take place on a bilateral basis, there is great room for information asymmetries to grow as to specific aspects of the negotiations such as the calculation of FRAND royalties, the essentiality of SEPs, and the cross-licensing of patent portfolios. Additionally, the meaning of FRAND is vague and there are no universal tools to calculate royalty fees in agreement with the FRAND framework. Thus, SEP holders can exercise opportunistic practices by demanding supra-FRAND fees. However, the uncertainty that a licence constitutes supra-FRAND could not be detected unless a case is brought before a court which could rule on the accurate calculation of FRAND rates. Despite that litigation is a means to resolve SEP disputes, reliance on litigation for conformity to standard setting principles by contributors to the process is inimical to the accessibility, diffusion, and adoption of standards. Thus, due to the information asymmetries and the lack of oversight, a SEP holder can exploit the uncertainties of the FRAND framework and impose ex-

traordinary fees, in their best interest but in conflict with the public interest as identified here by the principal. Thus, the manifestation of opportunistic holdup,¹³⁷ resulting from the goal conflict and information asymmetries, can be readily detected in standard setting.

The problem of patent holdup, as previously analysed, is fundamentally based on the advantageous position that a SEP holder acquires post-standardisation. Although opportunistic holdup results from ETSI members and not the institution itself, members' self-interested behaviour indirectly affects the agency relationship. This refers to the 'inter-capture' of the principal, in terms of principal-agent analysis, here, the Commission. The inter-capture is the indirect capture that occurs between the Commission and ETSI that stems from the cross-contamination of standard setting by the intra-capture of ETSI.

4.4 Conclusion

This chapter has analysed and demonstrated the indicia of intra-capture of ETSI by its members that evidence the tripartite capture model's applicability here. To recap the evidence permitting a diagnosis of capture: first, the study has shown that the public interest in standard setting is a concept vulnerable to the strategic involvement of industry participants in the pre-standardisation phase (ex ante opportunism), and the strategic use of SEPs (ex post opportunism). While considerable benefit from such powerful market actors' participation in standard setting can arise

¹³⁷ Love JH, 'Opportunism, Hold-Up and the (Contractual) Theory of the Firm' (2010) 166 *Journal of Institutional and Theoretical Economics (JITE) / Zeitschrift die gesamte Staatswissenschaft* 479.

from their invention sharing, market knowledge, and R&D investment, the consequences resulting from their potential strategic use of SEPs should not be ignored. A significant increase has been identified in SEP licensing, cross-licensing, and selling in the last decade. The ‘Patents and Standards’ report, carried out for the Commission, indicates the varied range of uses:

Some [vendors] try to gain back market share by demanding access to non-SEPs (or market essential patents) in return for licensing out SEPs. Others seek to develop entirely new income streams by cashing in on SEPs. It often translates in licensing out SEPs on a cash basis or in selling off SEPs, in most cases to so-called non-producing entities (NPEs) which subsequently license it out on a cash-only basis. Some of these NPEs pursue a rather aggressive strategy: you pay immediately or we go to court.¹³⁸

For instance, competing chipsets suppliers and manufacturers Qualcomm, Nokia, Ericsson, Samsung, and Motorola (all ETSI members) own the highest number of declared SEPs in all generations (1G-5G) of wireless telecommunication standards.¹³⁹ All four companies, have been involved in significant SEP litigations across the world, asserting their IPRs.

SEP strategies have become a tool for competing companies to maximise their market share, however, they can not only plague the standardisation process with anticompetitive effects but can also be detrimental to the public interest. SEP holders through the aggregation of SEPs and the strategic use of SEP portfolios,

¹³⁸ The European Competitiveness and Sustainable Industrial Policy Consortium, ‘Patents and Standards: A Modern Framework for IPR-based Standardization’ (2014) 1, 67.

¹³⁹ Goodman DJ and Myers RA, ‘3G Cellular Standards and Patents’ (2005 International Conference on Wireless Networks, Communications and Mobile Computing); Baron J and Pohlmann T, ‘Mapping Standards to Patents Using Declarations of Standard-Essential Patents’ (2018) 27 *Journal of Economics & Management Strategy* 504.

thereby, can act as gatekeepers of standardised technologies. This behaviour undermines the public interest as well as the principle of openness and accessibility that the EU sought to have embedded into EU standardisation processes.

Linked to the public interest being vitiated by this increasing strategic use of SEPs is that the primary driver for industry participants to join standard setting is to sponsor their patented technologies with the eventual aim that they become essential to a standard. As the above discussion shows, several empirical studies have proved that a substantial number of patents declared essential are of low quality. This indicates that SEP holders intentionally act to serve their own interests by exploiting the standard setting to enhance or concentrate market power and profits. Against this backdrop, pre- and post-standardisation phases should be considered the most active phases of strategic behaviour. Notably, the motive of technology contributors is to influence primarily the pre-standardisation phase of the standardisation process in order to materialise their strategies post-standardisation.

Further, the self-regulatory regime of ETSI may facilitate capture since its governance through the General Assembly raises questions as to the transparency and legitimacy of policy- and decision-making inside ETSI. As long as ETSI members administer the regulatory process of the organisation, the capture potential is amplified. Additionally, an information deficit as to ETSI members' incentives, e.g. strategic use of SEPs, generates asymmetries. Such information asymmetries may obscure the overarching principle of public interest that standard setting serves and trigger discrepancies in the standardisation process. As Bernstein states: “[agencies] tend to relate their goals and objects to the demands of dominant interest groups in

the economy.”¹⁴⁰ ETSI’s self-regulatory regime permits its members to drive the standard setting. Under this view, its institutional structure leaves the room for its members to manipulate the standardisation process by influencing ETSI’s organisational goals in order to achieve their own self-interests.

This study posits that the ETSI weighted voting system likely provides further leeway for ETSI members to materialise their self-interests.¹⁴¹ Units of contribution based on a member’s Electronic Communications Related Turnover control members’ financial contribution to ETSI. The higher turnover of a member, the more units of contribution and membership fee attributed to that member firm. These units also, however, accord greater voting weight. The more controlling participation of the highest earning companies in standard setting creates a possible legitimacy gap.¹⁴² Despite the consensus principle that is in place in ETSI, a fraction of top unit holding members possesses a great number of SEPs for ETSI standards. That could be problematic for two reasons: on one hand, members with greater voting weight could opt for their patented technologies which could be discriminatory against members with a lower-scale membership (SMEs), especially when the committees resort to the voting system. On the other, the weighted voting system itself overthrows in a paradoxical manner the consensus principle by enabling the top-tier members to take decisions among themselves about the development of a given

¹⁴⁰ Supra note 21 in Bernstein MH 92.

¹⁴¹ Ellis W, ‘Intellectual Property Rights and High Technology Standards in Standards Policy for Information Infrastructure’ in Kahin B and Abbate J eds, *Standards Policy for Information Infrastructure* (MIT Press 1995) 452.

¹⁴² Bekkers R and Seo D, *Quick scan for best practices in ICT standardization: What ETSI could learn from other standards bodies* (Commissioned by the Directorate of Energy and Telecommunications, Dutch Ministry of Economic Affairs Utrecht, Netherlands: Dialogic, 2008) 1, 30-31.

standard. In this respect, consensus is only meaningful for those who possess many units of contributions with the low-tier members (mainly SMEs) having no power to effectively influence the standardisation process.

Finally and most importantly, the development of the ETSI policy illustrates how industry participants, relying on coercive methods, can drastically affect and alter the route of the regulatory process. From the outset when ETSI's fate was seemingly at stake due to market actors' opposition to ETSI's interim IPR policy, ETSI modified the proposed licensing requirements. However, when regulators yield to growing pressure from private parties despite meaningful reservations as to the merits on a public policy basis, the phenomenon of regulatory capture takes place. In other words, when regulators, thus, depart from their designated objective, they are captured by regulatees' private interests.¹⁴³

Mapping the development of ETSI through years, it appears that Bernstein's theory of 'Life Cycle', discussed in Chapter 3, is apt.¹⁴⁴ Within the first few years of ETSI's operations, private groups opposed the proposed interim IPR Policy. ETSI was forced to adopt a more lenient IPR Policy, capitulating to private groups' demands. Following the adoption of a less restrictive IPR Policy, ETSI has enjoyed the broad participation of private actors and has obtained a status quo entrenched in the market. Since succumbing to these private interests, ETSI has abstained from enforcing a robust framework of policies in order not to trigger unfavourable conditions for its members/regulatees. As briefly illustrated above, elements that embed

¹⁴³ Supra note 21 in Bernstein MH; Bernstein MH, 'Independent Regulatory Agencies: A Perspective on their Reform' 400 *The Annals of the American Academy of Political and Social Science* 14.

¹⁴⁴ See 3.3.3.

negative effects and inefficiencies in standard setting, undermining its service of the public interest, may stem from ETSI's funding, governance, voting system, and policies.

Having diagnosed the intra-capture in ETSI, it raises questions about the ability of ETSI to deter its members from implementing private agendas with negative repercussions for standard setting. Although the ETSI Directives set the boundaries of the institution and the rules that ETSI members should comply with, they do little to alleviate the continued occurrence of opportunistic behaviour and strategic use of SEPs, including patent holdup. This, however, indirectly affects the agency relationship between ETSI and the Commission.

The third part of this chapter discussed the agency problem between the Commission and ETSI in relation to the goal conflict and the existence of information asymmetries leading to moral hazard and opportunistic holdup. Despite that ETSI's objective to diffuse broadly interoperability standards into the market complements the Commission's objective of creating a pro-competitive standards market, critical conflicts between the two institutions were detected and discussed above. ETSI intends self-expansion without effectively policing its members' strategic behaviour, hence, without preserving best practices. This allows its members to exploit information asymmetries found in the standardisation process and continue to pursue self-interest and turf-maximisation, which reaffirms the assumption of intra-capture.¹⁴⁵ Therefore, intra- and inter-capture are interconnected, as ETSI, the agent

¹⁴⁵ Lodge M, 'The Wrong Type of Regulation? Regulatory Failure and the Railways in Britain and Germany' (2002) 22 *Journal of Public Policy* 271, 274; Jordana J and Levi-Faur D, *The Politics Of Regulation : Examining Regulatory Institutions And Instruments In The Age Of Governance* (Edward Elgar 2004) 1, 126

of standard setting, desists from adopting regulatory measures to alleviate the risks of strategic behaviours which are antithetical to the Commission's objectives.

Clearly, the attendant problems of the agency relationship between the Commission and ETSI arise because of capture. The intra- and inter-capture of the agency relationship requires the principal's intervention, an imperative to attenuate the agency problems and restore the derailed public interest in standard setting. The deterioration of public interest and public policy objectives due to ETSI members' strategic and opportunistic behaviour stress the need for major changes to address the agency problem manifested and analysed in this study and termed as inter- and intra-capture of the standardisation process. On this basis, it could be posited that patent holdup recurs by virtue of capture since the agent (ETSI) appears to be at the mercy of some of its members that forces it to tolerate misconduct against other ETSI members with no immediate consequences for those who engage in questionable behaviour. It is postulated, therefore, that this manipulation of the standard setting occurs due to regulatory loopholes that provide the opportunity to the SEP holders to exploit standard setting with aggressive and illegitimate practices. Based on these findings, the next chapter draws on the importance of the introduction of new regulatory and policy measures to rectify these problems.

5 REGULATORY INTERVENTION AND POLICY RECOMMENDATIONS

5.1 Introduction

With regard to EU standard setting and the issue of patent holdup, this study has explored the soft-law mechanisms,¹ the antitrust cases² and the co-regulatory regime.³ This chapter now focuses on the Commission's existing policy initiatives and objectives to improve the standardisation system. Despite its recent forward planning initiative to improve transparency and efficiency in standard setting, a firmer regulatory intervention to strengthen the public interest should be deployed to ameliorate capture, deal with market failure, and restore the lost performance of the co-regulatory regime in standard setting.

In this concluding chapter, the introduction of regulatory measures is examined to determine whether the intra- and inter-capture found in the European standardisation system, as articulated in Chapter 4, could be diminished via competition law and regulatory tools. The aim of these recommendations is to present a better co-regulatory framework equipped with the necessary instruments to deal with the problems in standard setting.

The first part of the Chapter comprehensively sets out the Commission policy initiatives to modernise standard setting for achieving the Digital Single Market.

¹ See 2.3 and 2.4.

² See 2.5.

³ See 3.3.

It will also outline the Commission's proposals and prospective steps to safeguard EU standard setting against the strategic use of SEPs. Linked to that examination, the Chapter endeavours to explore the ex ante regulatory intervention in standard setting to correct the market failure created by monopolistic practices, market concentration, information asymmetries, and externalities. For this reason, it provides an overview of the ex ante regulatory intervention implemented previously by the Commission to liberalise and harmonise the telecommunications sector.

The Chapter then continues with the application of the criteria used for ex ante regulation to the ICT standardisation system with the overarching objective for the Commission to introduce a revised legislative framework that would incorporate the principle of accountability as well as oversight mechanisms into the Regulation 1025/2012 on the European standardisation system. The principle of accountability in connection with the oversight mechanisms can serve as tools to fine tune standard setting and increase the accountability and transparency of decision-making in ETSI.

The last section of the Chapter is divided into two main parts. First, it discusses proposed policy reforms of the ETSI IPR Policy and, then, a structural reform of the ETSI voting system. The study proposes that the Commission can initiate these reforms through an optional sector inquiry followed by an *ad hoc* investigation. The proposed set of policy recommendations for ETSI's adoption should safeguard the standard making process by increasing accessibility to standards while deterring opportunism at all stages of standard setting and preventing the probability of market failure as well.

5.2 The Commission's Standardisation Policy

The Commission inaugurated EU-wide standardisation in Europe as a prerequisite for economic integration and creation of the Single Market, including that in electronic communications. The Commission has since played the role of principal in the policy making and the regulatory development of standard setting. However, since the implementation of the co-regulatory regime for ETSI standard setting, the involvement of private parties has been essential to the standardisation policy making as European standards have been mainly privately driven.

The growing importance of ICT and its pervasiveness in interoperable networks and systems has further affected the Commission's policy making. Bolstering EU ICT markets via standardisation has a predominant position on the policy and regulatory agenda. In this regard, the Commission introduced a new 'Standardisation Package' which highlighted standardisation's important role in supporting the Europe 2020 Strategy for smart, sustainable and inclusive growth, and opening the way for new policies of modernisation of the standardisation process.⁴ Particularly, the Commission revised its standardisation policy and adopted the Regulation 1025/2012.⁵

One of the main aims of the Regulation, as analysed in Chapter 4, was to improve inclusiveness for SMEs and societal stakeholders in standardisation processes. In addition to this aim, Regulation 1025/2012 established rules in relation to

⁴ The European Commission, A strategic vision for European standards: Moving forward to enhance and accelerate the sustainable growth of the European economy by 2020, COM(2011) 311 final, 1.6.2011, 1, 3.

⁵ Regulation 1025/2012 of the European Parliament and of the Council on European Standardisation, [2012] OJ L 316/12.

the co-operation between the ESOs, national standardisation bodies, Member States, and the Commission. In general, it sets out requirements for: increased transparency⁶ and timeliness⁷ of the standardisation process; a revised framework of financial support of the European Standardisation system;⁸ and the identification of ICT technical specifications eligible for referencing.⁹ Building on the legislative framework of the Regulation, the Commission introduced a set of strategies, examined further below, to accelerate the growth of the innovation-based economy with the modernisation of the standardisation process being at the epicentre of these strategies.¹⁰

5.2.1 The Digital Single Market Strategy

In 2015, as part of the Europe 2020 plan, the Commission adopted a Digital Single Market Strategy to tackle online barriers preventing the emergence of a Digital Single Market (DSM) and to meet challenges of the digital economy.¹¹ Part of the DSM Strategy comprised an integrated standardisation priority plan focused on the development of new ICT technologies such as “5G wireless communications,

⁶ Ibid Articles 2 and 3.

⁷ Ibid Article 10.

⁸ Ibid Article 13.

⁹ Ibid Article 16 and 17.

¹⁰ The European Commission, White Paper - Modernising ICT Standardisation in the EU - The Way Forward, COM(2009) 324 final, 3.7.2009; The European Commission, A Digital Agenda for Europe, COM(2010)245 final, 19.5.2010; The European Commission, A strategic vision for European standards: Moving forward to enhance and accelerate the sustainable growth of the European economy by 2020, COM(2011) 311 final, 1.6.2011; The European Commission, State of the Innovation Union 2012 - Accelerating change: communication, COM(2013) 149 final, 21.3.2013; The European Commission, Public-private partnerships in Horizon 2020: a powerful tool to deliver on innovation and growth in Europe, COM(2013) 494 final, 10.7.2013.

¹¹ The European Commission, A Digital Single Market Strategy for Europe, COM(2015) 192 final, 6.5.2015.

digitisation of manufacturing (Industry 4.0) and construction processes, data driven services, cloud services, cybersecurity, e-health, e-transport and mobile payments.”¹²

In support of Regulation 1025/2012 on European Standardisation, the DSM strategy presented a three-pillar plan for the digital economy, in line with better regulation principles. These three-pillars consist of: i. better access for consumers and businesses to online goods and services across Europe; ii. creating the right conditions for digital networks and services to flourish; and iii. maximising the growth potential of the European Digital Economy.¹³ Beyond the pillars, the DSM strategy set a roadmap with sixteen interdependent actions to accomplish the DSM, including those targeted at removing or papering over residual national ‘silos’ including, wholesale mobile roaming, spectrum allocation (5G), portability of online content, copyright, personal data and e-privacy protection distinctions, cyber security frameworks, e-commerce updates, geo-blocking, and cross-border e-government recognition.¹⁴

¹² Ibid 15.

In subsequent communications, the Commission has emphasised the significance of ICT standards in the completion of the DSM strategy, stating: “[c]ommon standards ensure the interoperability of digital technologies and are the foundation of an effective Digital Single Market. They guarantee that technologies work smoothly and reliably together, provide economies of scale, foster research and innovation and keep markets open.” European Commission, ‘ICT Standardisation Priorities for the Digital Single Market’, COM(2016) 176 final, 1, 2; In another communication this was restated: “[a]cross all of the industrial and services sectors ICT standards, in particular open standards, play an important role in digitisation, by ensuring interoperability, lowering market barriers and promoting innovation. [...] Promoting these standards worldwide helps ensure European influence in the globalised economy beyond the single market.” European Commission, ‘Mid-Term Review on the implementation of the Digital Single Market Strategy’, COM(2017) 228 final, 1, 16.

¹³ Supra note 5 in COM(2015) 192 final at 3-4.

¹⁴ European Commission, Press Release on ‘Digital Single Market for Europe: Commission sets out 16 initiatives to make it happen’ (2015) IP/15/4919.

To date, 30 DSM legislative proposals were made, 28 of which were agreed by the European Parliament and the Council.¹⁵ Despite highlighting the challenges in the ICT standardisation, such as the need for faster development and delivery of standards and fair licensing conditions for SEPs,¹⁶ the Commission made no legislative proposal related to the EU standardisation approach. However, in 2017 the Commission published a Communication on ‘Setting out the EU approach to Standard Essential Patents’, analysed later in this chapter.¹⁷ The DSM strategy, although ambitious in its scope to improve the European digital economy, so far has only opened a path to discussing issues pertaining to standard setting. The next section

¹⁵ See: Decision on the use of the 470-790 MHz frequency band; Regulation on cross-border portability of online content services; Regulation as regards rules for wholesale roaming markets; Regulation and Directive on permitted uses in copyright for print-disabled persons and implementing the Marrakesh Treaty; Regulation to promote Internet Connectivity in local communities (Wi-Fi4EU); Regulation on Consumer Protection Cooperation; Regulation addressing unjustified geo-blocking; Council Regulation and Directive on Value Added Tax for e-Commerce; Regulation on cross-border parcel delivery services; Audio-Visual and Media Services Directive; Directive concerning contracts for the supply of digital content; Directive concerning contracts for the distance sales of goods; European Electronic Communications Code; Body of European Regulators for Electronic Communications; Directive on copyright in the Digital Single Market; Regulation on broadcasting organisations; Council Directive on Value Added Tax for e-publications; Regulation on ePrivacy; Regulation on protection of personal data by the Union institutions and bodies; Regulation establishing a Single Digital Gateway; Regulation on a framework for free flow of non-personal data; Regulation on the EU Cybersecurity Act; Directive on the combatting of fraud and counterfeiting of non-cash means of payment; Council Regulation establishing the European High-Performance Computing Joint Undertaking; Regulation on promoting fairness and transparency for business users of online intermediation services; Directive on the re-use of public sector information (recast); Regulation on the implementation and functioning of the .eu Top Level Domain name. See European Commission, ‘A Digital Single Market for the benefit of all Europeans: Towards a More United, Stronger and More Democratic Union’, (2019) available at https://ec.europa.eu/commission/sites/beta-political/files/euco-sibi-u-a_digital_single_market.pdf accessed on 1 September 2019. European Commission, ‘Roadmap for completing the Digital Single Market’ of 18 March 2019 available at https://ec.europa.eu/commission/sites/beta-political/files/dsm_roadmap_20190318_17.pdf accessed on 1 September 2019; European Commission, Communication on Completing a trusted Digital Single Market for all The European Commission's contribution to the Informal EU Leaders' meeting on data protection and the Digital Single Market in Sofia on 16 May 2018, COM(2018) 320 final, 15.5.2018.

¹⁶ *Supra* note 5 at 15.

¹⁷ European Commission, Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final, 29.11.2017. See 5.2.3 onwards.

examines the steps taken to date by the Commission to improve the European standardisation system.

5.2.2 The Joint Initiative on European Standardisation

As foreseen in the initial 2015 Single Market Strategy,¹⁸ the Commission did launch the ‘Joint Initiative on European Standardisation’ (the Initiative).¹⁹ Posited as “steps to better prioritise and to modernise the current European standardisation system, as well as to strive for the timely delivery of standardisation deliverables”²⁰ the Initiative is a soft-law mechanism. It was stated to be grounded in five objectives, set out in the Commission’s 2011 Communication²¹: “timeliness/speed, competitiveness, support to EU legislation and policies, inclusiveness and global market impact.”²²

In outline, the Initiative further states that it is based on the following values:

- deeper, fairer harmonisation of the European Single Market through technical standards;
- the New Approach concepts and standards in line with EU’s better regulation;

¹⁸ European Commission, ‘Upgrading the Single Market: more opportunities for people and business’ COM(2015) 550 final, 28.10.2015, 1, 12.

¹⁹ European Commission, ‘Joint Initiative on Standardisation under the Single Market Strategy’ (2016) 1.

²⁰ Ibid 3.

²¹ European Commission, ‘A strategic vision for European standards: Moving forward to enhance and accelerate the sustainable growth of the European economy by 2020’ COM(2011) 311 final.

²² Ibid 6.

- standard setting's contribution to the European Digital Single Market;
- the voluntary and market-driven character of standards;
- European and global competitiveness through standardisation;
- Standards' contribution to the improvement of economic, societal and environmental welfare, including the health and safety of consumers and workers;
- the use of standards for societal, economical, and public policy interests' goals.²³

These are all well-established values that have arguably underpinned the EU standardisation system to date. The reiteration of these suggests that they also seek to serve the DSM mission but without any new timely principles addressed to the difficulties emerging in the digital era, such as the necessity for unrestrictive and uninterrupted access to standards by all market actors.

Following the co-regulatory paradigm, the Initiative is a public-private-partnership (i.e. the EU and EFTA Member States, standardisation organisations and bodies, European industry and industry associations, SMEs, and societal stakeholders) with the Commission as the principal co-ordinator. A Steering Group was charged with carrying out various aspects of the Initiative to prioritise, modernise, and speed up the standardisation process. In particular, it drafted a set of actions on three priority cluster domains related to barriers that standardisation must overcome:

²³ Supra note 19 at 4.

1. Awareness, Education and Understanding about the European Standardisation System i.e. increasing the relevant use of standards and participation in the process at all levels;
2. Coordination, Cooperation, Transparency and Inclusiveness, i.e. ensuring adequate, high-quality, user-friendly and timely European standards;
3. Competitiveness and International dimension, i.e. standards supporting European competitiveness in the global markets.²⁴

These specified actions, accompanied by pilot projects, are intended to aid to the success of the Initiative.²⁵ The Annex of the Initiative identifies, in total, 15 actions, three of which are pilot projects.²⁶ Most aim to open a dialogue between the different stakeholders in standardisation to improve, for example, the exchange of information with industry (Action 6), awareness (Action 4), and inclusiveness (Action 9).²⁷

The Initiative via Action 15, a pilot project to improve representation of European SMEs' interests in international standardisation processes, pursues the extension of SMEs' representation and influence in the standardisation process at a technical and policy level not only regionally but also internationally.²⁸ Under this Action, in 2017, ETSI launched the '3SI Programme' to "increase the visibility of the

²⁴ Ibid 6.

²⁵ Ibid 10 onwards.

²⁶ Ibid.

²⁷ Ibid 14. Also, among these actions, policy objectives are sought for the digitisation of the EU industry at a regional level (Action 14). See European Commission, Press Release: Commission sets out path to digitise European industry, (2016) available at http://europa.eu/rapid/press-release_IP-16-1407_en.pdf accessed on 1 September 2019.

²⁸ Supra note 19, 14-15.

societal stakeholders' and SMEs' interests in [the] standardization work."²⁹ ETSI established an '3SI advocate' who will support the SMEs in matters such as inclusiveness and ETSI work items that would be in the interest of SMEs. Further, the 3SI advocate will promote SMEs interests by reviewing their opinions concerning adopted European Standards and relay them to the ETSI committees and the ETSI Board.³⁰ Although this initiative may highlight SMEs interests with ETSI administrative bodies, it does not, however, provide representation of these interests in any way analogous to the ETSI members of large enterprises. It appears possibly a mere sop to inclusiveness. Yet, since as the Commission notes that SMEs comprise 99% of EU businesses³¹ and recent findings are that fewer than 1 in 5 companies have adopted new digital technologies, the inclusion of this group may need to be more meaningful.³²

In conclusion, although the DSM strategy and the Joint Initiative emphasise the need for the modernisation of the EU standardisation system in light of the 'fourth industrial revolution' important to the EU's continued economic development, it appears that the effort may offer nothing new. Of particular concern is the

²⁹ ETSI, 'Standards and Society: the ETSI 3SI Programme' (2017) available at <https://www.etsi.org/images/files/Brochures/ETSI-3SI-Brochure-WEB.pdf> accessed on 1 September 2019.

³⁰ Ibid.

³¹ European Commission, 'Entrepreneurship and Small and medium-sized enterprises (SMEs)' available at https://ec.europa.eu/growth/smes_en accessed on 1 September 2019.

³² European Commission, 'Standardisation to Support Digitisation: Report from the Workshop on Standardisation to Support Digitising European Industry' (Brussels, 17 October 2017) 1, 6.

involvement of various stakeholders who represent different if not divergent interests.³³ The Commission adopted a bottoms-up approach, mirroring the notion of co-regulation, to promote inclusiveness and openness in the regulatory reformation of the European standardisation system, but this could have adverse effects. The Commission may encounter obstacles in balancing the interests of all these actors while pursuing modernisation of standardisation in such a short timeframe. This could also result in increased bureaucracy and could turn this initiative into a time and resource-intensive task. A recent initiative workshop report highlighted challenges to modernisation in the existing complexity of the standards development landscape with its myriad of standards at all levels, divergent cultural differences and ways of working of different groups as well as potential for overlap and gaps.³⁴ While the benefits of the bottoms-up approach, strongly urged by industry, could be numerous, for reasons that will be discussed in this chapter, the Commission should adopt a top-down approach especially for the issue of patent holdup. The following discusses the Commission's initiatives to deal with the issues of SEP licensing in Europe.

³³ Based on a recent leaflet released by the Commission, more than 100 participants have signed the partnership of the Joint Initiative including the EU and EFTA Member States, European and national standardisation bodies; associations representing consumers, environmental interests, workers, industry and SMEs; and individual businesses from several sectors. See The European Commission, 'Brochure: The Joint Initiative on Standardisation' (2019) available at <https://ec.europa.eu/docsroom/documents/35781?locale=en> accessed on 1 September 2019.

³⁴ European Commission, *Standardisation to Support Digitisation: Report from the Workshop on Standardisation to Support Digitising European Industry* (Brussels, 17 October 2017) 1, 23-24.

5.2.3 Commission's Leadership in SEP Licensing Policy

In April 2016, the Commission released a Communication on the 'ICT standardisation Priorities for the Digital Single Market',³⁵ which appeared contemporaneously with the Digital Single Market Strategy. The Commission adopted this Communication to bring together the previous annual work programmes on standardisation.³⁶ In it, the Commission acknowledged that there are key challenges to standard setting improvement such as rapid technological development, interconnection of digital systems, increased complexity from the proliferation of ICT standards by diverse bodies, accessibility to standards, and insufficient political support.³⁷ The Commission, therefore, laid out a two-pillar plan within the DSM for the next wave of technology standardisation (5G) premised on better regulation.³⁸

As the first pillar, the Commission identified five essential improved standardisation targets, calling them "building blocks" of the DSM: 5G communications, cloud computing, the internet of things (IoT), (big) data technologies and cybersecurity.³⁹ For the second pillar, the Commission envisaged establishing a high-level political process to achieve the prioritised actions of the first pillar. According to the Commission: "[t]his process will build on and complement the European Multi-stakeholders Platform, the ICT Rolling Plan on ICT Standardisation and the Annual Union Work Programme for European Standardisation as delivery mechanisms for

³⁵ The European Commission, ICT Standardisation Priorities for the Digital Single Market, COM(2016) 176 final, 19.4.2016.

³⁶ Under Article 24 of the Regulation 1025/2012 the Commission issues annual work programmes where it identifies key priorities for the European standardisation. *Supra* note 5 in Regulation 1025/2012.

³⁷ *Supra* note 35, 3-4.

³⁸ *Ibid* 4.

³⁹ *Ibid* 5 and 12.

standards and standardisation deliverables.” Thus, it added five “new” elements to the process to improve the efficiency of standard setting: “1) validation of priorities and improving the efficiency of the standard-setting process in Europe; 2) regularly reviewing and monitoring progress; 3) improving EU support to ICT priority standardisation; 4) ensuring fair and non-discriminatory access; and 5) strengthening the EU's presence in international dialogue and cooperation on ICT standards.”⁴⁰ Although these elements were promoted as new, these are just concepts that have been repeatedly rehashed.⁴¹

Important here, however, is that one of the key elements is the efficient and acceptable licensing approach of standards based on a balanced SSO IPR Policy. The Commission observed that ICT standardisation should be governed by “a balanced IPR Policy based on FRAND licensing terms” to ensure fair and non-discriminatory access to standards.⁴² While not a novel statement, somewhat new was the Commission's focus on four areas of uncertainty within IPR policies and FRAND: “(i) who is the relevant community of standard essential patent holders; (ii) the cost of the cumulated IPR needed to implement the standard; (iii) the methodology applied to calculate the value of the licensing terms; (iv) the regime regarding the settlement of disputes.”⁴³ Also noteworthy was the key element of a regular review and monitoring of the standardisation process by the Commission in terms of the five “building

⁴⁰ Ibid 13-14.

⁴¹ See for example: European Commission, ‘The competitiveness of the European Information and Communication Technologies (ICT) Industries’ COM(97) 152 final, 16.04.1997; European Commission, ‘White Paper: Modernising ICT Standardisation in the EU - The Way Forward’ COM(2009) 324 final, 3.7.2009.

⁴² Supra note 35, 13.

⁴³ COM(2016) 176 final ibid 13.

blocks” to achieve the DSM.⁴⁴ This review and monitoring process will further build on the ‘reporting obligations’ of Article 24 of Regulation 1025/2012 reporting any progress made in the ICT standardisation to European Parliament and Council.⁴⁵

Also importantly, the Commission has since focused on problems arising from the intermittent licensing of SEPs and the FRAND regime. In its 2017 Communication ‘Setting out the EU approach to Standard Essential Patents’,⁴⁶ the Commission posited a framework to address four key areas for improvement: increased transparency on SEP exposure; general principles for SEP FRAND licensing; a predictable enforcement environment for SEPs; and open source and standards.⁴⁷ These are addressed in turn below.

5.2.3.1 Transparency of the SEP Declaration System

According to the Commission, there is insufficient access to SEP information despite the plethora of declaration data stored on the SDO’s databases where this is collected.⁴⁸ To tackle this, the Commission first suggested that the databases should be overhauled to improve accessibility via: a more user friendly interface for all in-

⁴⁴ Ibid.

⁴⁵ Under Article 24, the ESOs are required to produce and send annual reports to the Commission regarding their standardisation activities on the implementation of the 1025/2012 Regulation. Similarly, the Commission is subject to reporting requirements. It must prepare a report every five years and present it to the EU Parliament and the Council.

⁴⁶ The European Commission, Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final, 29.11.2017.

⁴⁷ Ibid. The area of open source and standards is not related to the scope of the study and thus not further analysed here.

⁴⁸ Ibid 3-4. See also Pohlmann T and Blind K, *Landscaping study on Standard Essential Patents (SEPs)* (IPlytics GmbH, Technical University of Berlin, 2016); and ‘Patents and Standards - A modern framework for IPR-based standardization’ (2014) ECSIP.

terested parties, i.e. SEP holders, users, and third parties; upgrades to the searchability of historic declaration information; elimination of duplicative, incomplete declarations, and other obvious flawed data; and links to patent office databases' relevant information of the patented technologies.⁴⁹

Secondly, the Commission proposed transforming the SDO's declaration system into a robust informational tool to facilitate negotiations for SEP licences. Thus, declarations of essential patents should be updated at the final stage of the standardisation process with the grant of the patent reflecting the exact patent claims.⁵⁰ Further, SEPs should be linked to the relevant standard and the patent family to which they belong with any information related to the litigation details of a SEP.⁵¹ Another submitted measure would scrutinise essentiality claims to minimise the over-declaration of SEPs.⁵²

These are all positive proposals that could facilitate the process of searching essential patents and the licensing negotiations of SEPs. The revamp of the SDO databases would primarily allow the SEP users to navigate the databases more efficiently and make informed decisions for the implementation of future standardised technologies. This should also encourage innovation as it will allow competitors to invent around essential patents that are key to a standard, driving down the costs of standardised technologies. This chapter will subsequently explore the essentiality

⁴⁹ Ibid COM(2017) 712 final 3-4.

⁵⁰ Ibid.

⁵¹ Ibid.

⁵² Ibid 5. Based on the principle of proportionality to strike a balance between costs and the essentiality claims scrutiny, it suggested that an incremental approach should be applied upon request to one patent within a family or to samples.

checks and provide recommendations for the introduction of stricter requirements.⁵³

5.2.3.2 FRAND Licensing Term Principles

Concerning the second key area, FRAND licensing, the Commission underlined that the undefined meaning of 'FRAND' terms has hindered SEP licensing, negatively affecting not only new technologies but also standard setting.⁵⁴ Targeting stabilisation of the licensing environment, the Commission suggested some principles for the FRAND concept. While reaffirming its view that there is no one-size-fits-all solution to evaluate FRAND licences, it put forward IP valuation principles for consideration.

The first is that economic value of the patented technology should be based on the technology itself and not on its inclusion into the standard.⁵⁵ Alternatively, where the technology does not have a market value outside the standard, the evaluation should be based on a comparison to other contributions to identify the relative importance of the patented technology.⁵⁶ Moreover, the present value of a patented technology should be taken into account without regard to the success of the product in the market. The Commission also posited that technology contributors should submit their best technologies to the standards.⁵⁷

⁵³ See section 5.4.2.1.

⁵⁴ *Supra* note 46 at 6.

⁵⁵ *Ibid* 6.

⁵⁶ *Ibid* 6-7.

⁵⁷ *Ibid*

Last but not least, to mitigate the problem of royalty stacking, the Commission proposed that either the parties should take into consideration the overall added value of the technology and set reasonable aggregate rates for standards, or that industry licensing platforms or pools, within the scope of EU competition law, could set the maximum cumulative rate.⁵⁸ In addition to the above principles, the Commission, in agreement with the UK High Court's ruling in *Unwired Planet*,⁵⁹ emphasised that FRAND rates should reflect its non-discriminatory element and SEP holders should not discriminate against 'similarly situated' SEP licensees.⁶⁰

While some of these proposals are not fully new, having been postulated or adopted or endorsed by other SSOs⁶¹ and different court decisions, it is the first time that the Commission has attempted to set some economic boundaries around SEP licensing. Although the Commission was previously reluctant to address the issue of FRAND calculations, these proposals prove that it is necessary to establish certain evaluation tools to facilitate the calculation of FRAND royalties in the licensing process of SEPs. These evaluation tools should be perceived as complementary to the *Huawei Test*.

⁵⁸ Ibid

⁵⁹ *Unwired Planet International v Huawei Technologies* [2017] EWHC 711 (Pat), 485.

⁶⁰ Supra note 46 at 8.

⁶¹ For example, IEEE in its recently updated IPR policies adopted the 'smallest saleable patent practicing unit' approach.

5.2.3.3 SEP Enforcement Environment

In mapping the SEP enforcement landscape, the Commission, addressing the third key area, noted that SEPs are highly litigated compared to other patents and there is the risk of patent holdup with the aggressive enforcement of SEPs.⁶² It endorsed the CJEU's test from the *Huawei* decision, as a means to evaluate the willingness of a licensee to enter into negotiations and provided guidance stemming from subsequent national case-law application of the test.

This guidance elaborates the *Huawei* test's negotiation steps to offer clarification about behavioural compliance with FRAND terms. Regarding the SEP holder's offer, the guidance suggests it should be sufficiently detailed and include information such as "essentiality for a standard, the allegedly infringing products of the SEP user, the proposed royalty calculation and the non-discrimination element of FRAND."⁶³ The counter-offer of the willing licensee should be similarly concrete and specify the exact use of the standard in the specific product.⁶⁴ According to the Commission, the submission of the parties to binding third-party FRAND determination indicates a FRAND behaviour.⁶⁵ Another guidance from the Commission relates to the timeliness of the counter-offer of the potential licensee. With the improvement of the SDO's declaration databases and the clearing of redundant data, the Commission further envisages timely responses to a counter-offer by SEP users as a result of the decreased number of the declared SEPs.⁶⁶ Moreover, as a measure

⁶² Supra note 46 at 9.

⁶³ Ibid 10.

⁶⁴ Ibid.

⁶⁵ Ibid.

⁶⁶ Ibid.

against patent hold-out, the Commission proposed that the amount of the security that a SEP user should submit as protection against injunctions be fixed at a level to discourage patent hold-out strategies.⁶⁷

Relatedly, the Commission stressed that the availability of injunctions should meet the proportionality requirement per Article 3(2) of the IPR Enforcement Directive and its assessment conducted carefully on a case-by-case basis.⁶⁸ Concerning the portfolio licensing of SEPs, the Commission, essentially in keeping with its soft-law guidelines for patent pools, posited that global licences are acceptable as long as the portfolio is limited to SEPs of a technology that a licensee needs to practise the standard including only necessary and complementary technologies but not competing ones.⁶⁹ Importantly, a counter-offer of portfolio licensing cannot refer to individual SEPs but all SEPs of the given portfolio.

The Commission considered that alternative dispute resolution (ADR) mechanisms are a less costly and more efficient forum for SEP disputes that been underexploited.⁷⁰ The Commission linked the success of such mechanisms with the introduction of the Unified Patent Court (UPC) which will provide an experts' arbitration and mediation centre and include the dispute outcomes in the SDO's databases.⁷¹

⁶⁷ Ibid.

⁶⁸ As per Article 3(2) of the Directive 2004/48/EC: “[t]hose measures, procedures and remedies shall also be effective, proportionate and dissuasive and shall be applied in such a manner as to avoid the creation of barriers to legitimate trade and to provide for safeguards against their abuse.” Directive 2004/48/EC of 29.4.2004 on the Enforcement of Intellectual Property Rights, OJ L 195/20 of 2.6.2004.

⁶⁹ Supra note 46, 11.

⁷⁰ Ibid.

⁷¹ Ibid.

Regarding patent assertion entities, the Commission posited that safeguards in place are sufficient to tackle any harmful practices⁷² particularly the robustness of the existing litigation system that would only be reinforced further by the UPC's establishment and that the Commission would continue to monitor such entities' impact on the market.⁷³

As with other soft-law approaches, these recommendations are unobjectionable in their substance but merely aspirational in their enforcement. Citing what is effectively the current system as the remedy to tackle existing harms would seem a gloss. These somewhat minor soft-law details to colour in the *Huawei* lines are effectively tinkering at the edges. Moreover, the appointment of new consortiums of public and private entities to address the problems derived from old consortiums of public and private entities without more seems likely a plan for mere wheel spinning, as the below considers more fully.

5.2.4 Analysis

Overall, the standardisation policy that the Commission has set out is arguably a step forward. It is, moreover, evident that the Commission recognises and, at least, aspires to correct the problems with SEP licensing negotiations and enforcement and to hone the standardisation process policy framework. These stated aspirations are optimistically ambitious, given their optional, soft-law approach.

⁷² According to a study, conducted on behalf of the Commission, PAEs: “[...] consistently engage in the assertion of patents as their key modus operandi [...] PAEs prioritize patent litigation value rather than its technological application.” European Economics, Thumm N and Gabison G (eds), *Patent Assertion Entities in Europe: Their Impact on Innovation and Knowledge Transfer in ICT Markets* (Joint Research Centre, 2016) 1, 17-18.

⁷³ Ibid COM(2017) 712 final 11-12.

Modernising the standardisation system in a more systematic and integrated manner will, practically speaking if only for the technical expertise, require the strong involvement of various stakeholders and private parties to appropriately change the diverse standards-related activities. As outlined in the Horizon 2020 for the Innovation Union, a public-private partnership can be a workable tool to jointly develop actions and address common objectives.⁷⁴ It is, therefore not unexpected that the Commission set up a group of experts in licensing and valuation of SEPs to define its tasks and its structure in the view that this could prove helpful.⁷⁵ However, existing standardisation policy initiatives have failed to address the repercussions of strategic behaviour in standard setting, as previously discussed in this study. It is questionable how a similar approach will prove any different in outcome now.

Also, while the Commission has acknowledged the implications of the thorny FRAND licensing landscape, it has made no attempt to determine the underlying causes of it related to the potential misconduct of the SEP holders. Lastly, the Commission has effectively waived any SDO responsibility to cope with the SEP licensing issues in stating that “[c]onflicting interests of stakeholders in certain SDOs may make it difficult for these organisations to provide effective guidance on such complex legal and intellectual property (IP) policy issues.”⁷⁶ Here, the Commission, as the principal of the co-regulatory regime of standard setting, lifted the obligation

⁷⁴ The European Commission, ‘Public-Private Partnerships in Horizon 2020: A Powerful Tool to Deliver on Innovation and Growth in Europe’, COM(2013) 494 final, 10.7.2013, 10-11.

For example, the Commission identified that research and innovation (R&I) are high risk activities prone to fail, thus, it is less appealing for private parties to invest on a questionable activity. *ibid* 1, 3.

⁷⁵ The European Commission decision on setting up a group of experts on licensing and valuation of standard essential patents, COM(2018) 4161 final, 5.7.2018.

⁷⁶ *Supra* note 46, 2.

from the SDOs as regulatory agents to rectify the shortcomings of the SEP licensing environment.

Yet, as previously explored, the weakness of the agent to regulate and balance the interests of their members signals the existence of capture. This implies that the Commission recognises the systemic weakness, generally, and accepts it, despite that it is a specific indicator of regulatory capture. Thus, the Commission should take more definitive steps against the self-interests that prevail in the standardisation process to clearly demarcate the boundaries and restore the public interest. More particularly, the Commission should identify the key weaknesses of the ETSI policies regarding licensing of IPRs and the FRAND framework and be proactive eliminating the existing regulatory gaps that enable ETSI members to take advantage of them. The next section proceeds with a set of recommendations that aim to complement the Commission's initiatives and, ultimately, to correct the addressed issues of strategic behaviour, patent holdup, and capture in standard setting.

5.3 Better Co-Regulation Through Intervention

As previously noted in Chapter 3, co-regulation in standard setting was adopted as a better mode of EU governance and part of the EU's strategy on better regulation. However, the indicators of both market failure and capture in standard setting suggest that low-intervention techniques are inadequate to deal with SEP holders' strategic behaviour, raising the question of the effectiveness of the co-regulatory and better regulation regime in standard setting. As Saurwein highlights “[f]rom a public policy perspective the central questions in the context of regulatory

choice are whether the adoption of an alternative regulatory solution by private actors is feasible at all, and—if adopted whether the arrangement is durable and effective in meeting the public interest.”⁷⁷ Endorsing this view, this study posits that the existing co-regulatory model is ineffective to preserve public interest in standard setting. Therefore, regulatory intervention is necessary to correct these shortcomings and redevelop a framework for the European standardisation system.

To identify the suitable degree of the intervention, this study uses the approach of ‘degrees of capture’, introduced by Carpenter and Moss, apparently the first to use the terms strong and weak capture to delineate the level of influence of narrow interests driving regulation away from the public interest.⁷⁸ Strong capture refers to the violation of: “[...] the public interest to such an extent that the public would be better served by either (a) no regulation of the activity in question – because the benefits of regulation are outweighed by the costs of capture, or (b) comprehensive replacement of the policy and agency in question.”⁷⁹ Whereas, weak capture occurs “[...] when special interest influence compromises the capacity of regulation to enhance the public interest, but the public is still being served by regulation, relative to the baseline of no regulation.”⁸⁰ This approach is particularly useful to define not only the degree of capture but also the accurate degree of intervention.

⁷⁷ Saurwein F, ‘Regulatory Choice for Alternative Modes of Regulation: How Context Matters’ (2011) 33 *Law & Policy* 334, 339.

⁷⁸ Carpenter D and Moss DA, ‘Introduction’ in Carpenter D and Moss DA (eds), *Preventing Regulatory Capture: Special Interest Influence and How to Limit it* (Cambridge University Press 2013) 11-12.

⁷⁹ *Ibid.*

⁸⁰ *Ibid.*

The existing regulatory mechanisms of the standardisation regime appear to be inadequate to limit the development of capture. That includes the relevant soft-law mechanisms of the self-regulation of ETSI, the Horizontal Guidelines, the Commission's policy initiatives, e.g. the DSM, Standardisation Package, and Joint Initiative, as well as the hard-law mechanism of the *Huawei* test. Yet, it cannot be assumed that strong capture exists as the capture does not fully undermine the public interest in the regulatory regime of standard setting.⁸¹ Nevertheless, neither it can be labelled weak capture, since the established opportunism continuously and increasingly puts at risk the public interest of the standard regime generating enhanced costs, delays in the adoption of standards, and in some instances restrictions of consumer choices via opportunistic practices. Therefore, this study posits the existence of a 'medium degree' of capture, somewhere between the two poles and that does not require a full overhaul of the regulatory regime but with harms that cannot be merely ignored (such as the Commission's recent efforts to bolster the status quo show).

In this context, for the resolution of capture and the endemic issues in standard setting, this study contends that a significant and more targeted intervention is required with the adoption of a traditional regulatory approach (command-and-control). Although this is a more intrusive regulatory action in juxtaposition to better regulation techniques, regulatory intervention is stipulated as a more reactive and proactive response to market failure and opportunism that jeopardises the standard setting.

⁸¹ Ibid. This is noticeable as there is a range of ICT products implementing standardised technologies while contributing to the growth of the digital markets such as Internet of Things.

This study also adopts the welfare economics' theoretical rationales for regulatory intervention as a response to market failure.⁸² As discussed in Chapter 3, market failure traditionally arises in at least four situations: market power, externalities, information asymmetries, and public goods.⁸³ The earlier chapters have shown the existence of market power, information asymmetries, and public goods in standard setting. Market power can be conferred to a SEP holder post-standardisation via the inclusion of a core technology in a widely adopted standard, leading to the exclusion of competing alternative technologies. Information asymmetries stem from the uncertainty surrounding the true quality of the technologies declared essential to a standard coupled with the strategic use of such technologies by their holders. Standards are regarded as quasi-public goods because they can be non-rivalrous but not always non-excludable.

Considering externalities in standard setting, these may be positive and negative. Positive externalities occur with the adoption of compatibility standards that leads not only to the reduction of transaction costs in producing standards-compliant goods but also contributes to the consumer welfare generally via greater availability of technology and the benefits of technological advancement that diffusion can bring.⁸⁴ In contrast, negative externalities can arise in proprietary standards when

⁸² See Chapter 3, section 3.3.2. See also Veljanovski C, 'Strategic Use of Regulation' in Robert B and others (eds), *The Oxford Handbook of Regulation* (Oxford University Press 2010); Fenn P and Veljanovski CG, 'A Positive Economic Theory of Regulatory Enforcement' (1988) 98 *The Economic Journal* 1055; Joskow P and Noll R, 'Regulation in Theory and Practice: An Overview' *Studies in Public Regulation* (National Bureau of Economic Research, Inc 1981); Ogas AI, *Regulation: Legal Form and Economic Theory* (Bloomsbury Publishing 2004) 29.

⁸³ See Chapter 3, section 3.3.2.

⁸⁴ Belleflamme P, 'Coordination on Formal vs. de facto Standards: A Dynamic Approach' (2002) 18 *European Journal of Political Economy* 153, 155 and 172.

SEP holders restrict the diffusion of standardised technologies in the market producing suboptimal results.⁸⁵ This is the case when SEP holders behave opportunistically and strategically use their IRPs to either extract higher royalties or drive competitors out of the market or to increase their market share and power. Together the above factors pinpoint the existence of market failure.⁸⁶ Therefore, these factors provide the conditions for regulatory intervention to be justified in order to ensure social outcomes that are in line with public interest.

The rapid change in the dynamics of standard setting in conjunction with the fast-technological advancement, the market concentration,⁸⁷ and the rise of strategic behaviour in ICT support the premise that regulatory reforms need to be responsive to these changes to ensure effective competition while encouraging the diffusion of new technologies via standards in support of the public policy objectives. Opportunism, gestating within ETSI over time, was at the core of the analyses of the above elements building on the market failure and capture rationales. Therefore, not only agency theory rationales but also welfare economic rationales justify regulatory intervention.

The increased levels of information asymmetries and externalities as well as opportunism in standard setting signal the malfunction of both the co-regulatory

⁸⁵ Geradin D and McCahery JA, 'Regulatory Co-Opetition: Transcending The Regulatory Competition Debate' in Jordana J and Levi-Faur D, *The Politics Of Regulation : Examining Regulatory Institutions And Instruments In The Age Of Governance* (Edward Elgar 2004) 99; Grasso R, 'Selected Issues in SEP Licensing in Europe: The Antitrust Perspective' in Bharadwaj A and others (eds), *Complications and Quandaries in the ICT Sector: Standard Essential Patents and Competition Issues* (Springer Singapore 2018) 81.

⁸⁶ As Farrell argues: "The welfare theorem lets [us] classify inefficiencies as due to monopoly externalities, and so on. This helps us to understand and perhaps to solve such inefficiencies just as a doctor's diagnosis [...] is part of treatment." Farrell J, 'Information and the Coase Theorem' (1987) 1 *The Journal of Economic Perspectives* 113, 129.

⁸⁷ See 5.3.1.2 for a further discussion on market concentration of big tech companies.

regime and that of the better regulation mode. With the unwillingness of ETSI to reduce the risk of opportunism and capture in its realm, the Commission needs to come to the fore. Despite its introduction of various soft-law guidelines and policies to tackle the issues in the European standardisation system, the Commission has been reluctant to take more robust measures against opportunists who strategically exploit either their market power or information asymmetries tied with standard setting to maximise their profits.

Market failure and capture can be addressed with appropriate regulation. Yet, the targeted measures and goals ought to be prescriptive, otherwise there is the risk for agency problem and capture. Balleisen and Eisner argue that “[i]f regulatory goals are not defined with sufficient precision, we can hardly expect any regulatory agent, whether public or private, to attain them.”⁸⁸ The presence of the agency problem in the relationship of the Commission and ETSI requires an interventionist principal to deal specifically but rigorously with the conflict of goals, adverse selection, and moral hazard facilitating the appearance of the intra- and inter-capture.

⁸⁸ Balleisen EJ and Eisner M, 'The Promise and Pitfalls of Co-Regulation: How Governments Can Draw on Private Governance for Public Purpose' in Moss DA and Cisternino J (eds), *New Perspectives on Regulation* (The Tobin Project 2009).

Regulation, standardisation, and innovation inarguably influence each other.⁸⁹ While regulation guides the innovative and standardisation processes, innovation informs and shapes regulation.⁹⁰ However, regulatory reforms should not sacrifice the original regulatory objectives for technological advancement.⁹¹ As previously shown, the recent standardisation policy initiatives of the Commission and ex post enforcement to date have insufficiently responded to uphold the public policy objectives and public interest. Therefore, it is contended that ex ante intervention is required in order to achieve corrective measures against patent holdup.

5.3.1 Ex Ante Regulatory Intervention

The Commission, according to Article 17(2) of the Treaty on European Union (TEU),⁹² is the sole holder of the right of legislative initiative and can introduce an overhauled regulatory framework to build a better standardisation system which is essential to complete the DSM. In order to realise this, the Commission should not rely only on ex post harm-based approach, namely antitrust enforcement of Articles 101 and 102 of the TFEU, but it needs to adopt a proactive approach based on

⁸⁹ Blind K, 'The Influence of Regulations on Innovation: A Quantitative Assessment for OECD Countries' (2012) 41 *Research Policy* 391.

⁹⁰ Swann P, *The Economics of Standardization: An Update* (Report for the UK Department of Business, Innovation, Skills)' (2010) available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/461419/The_Economics_of_Standardization_-_an_update.pdf accessed 1 September 2019; Blind K, 'The Impact of Regulation on Innovation' in Edler J and others (eds), *Handbook of Innovation Policy Impact* (Handbook of Innovation Policy Impact, Edward Elgar 2016) 423; Blind K, Petersen SS and Riillo CAF, 'The Impact of Standards and Regulation on Innovation in Uncertain Markets' (2017) 46 *Research Policy* 249.

⁹¹ OECD, 'Regulatory Reform and Innovation' 1,11 at <https://www.oecd.org/sti/inno/2102514.pdf> accessed 1 September 2019.

⁹² Treaty on European Union (TEU) [2012] OJ C326/13.

ex ante regulation to prevent market failure, promote market making,⁹³ and achieve the DSM objectives for the standardisation process.

The ex ante regulatory approach is not an extraordinary one. Indeed, the Commission has previously implemented sector-specific ex ante regulation as needed to address EU-wide market failure, i.e. monopoly, in the face of a critical need to promote a technologically advanced Single Market in electronic communications – telecommunications networks.⁹⁴ Such regulation, particularly that based on a principle of open network provision (ONP),⁹⁵ was, among other things, intended to address the capture of national technical standards by the then former incumbent Member State monopolists, recognising that the electronic communications networks are heavily dependent on and interconnected with ICT standardisation. The ONP Directive was a framework Directive containing broad principles conceived to open the path for private sector telecommunications companies to access the supply and operation of the network infrastructure owned by state-owned incumbents operating as traditional public-sector bureaucracies.⁹⁶ In broad terms, as discussed below, the creation of ETSI facilitated the effort of the ex ante regulation in telecommunications with the harmonisation of ICT standards. Therefore, the ICT standardisation is intrinsically linked with the telecommunications/electronic communications market.

⁹³ Sauter W, *Coherence in EU Competition Law* (Oxford University Press 2016) 6.

⁹⁴ The terms electronic communications and telecommunications are used interchangeably.

⁹⁵ Council Directive 90/387/EEC on the establishment of the internal market for telecommunications services through the implementation of open network provision [1990] OJ L192/1.

⁹⁶ Doyle C, 'Effective Sectoral Regulation: Telecommunications in the EU' (1996) 3 *Journal of European Public Policy* 612; De Cockborne JE, 'Towards an Open European Telecommunications Market in 1998: Recent Developments of EU Telecommunications Policy' (1994) 8 *International Review of Law, Computers & Technology* 269.

This section examines how *ex ante* intervention was applied in the past in the telecommunications sector. A detailed examination of the regulatory reform of the telecommunications sector is outside the scope of this study, however, it is helpful to highlight a few main aspects as they contribute to a fuller understanding of the *ex ante* regulatory intervention by the Commission. Following the telecommunications paradigm, this section further develops a framework in which *ex ante* regulation would be justified and allow the Commission to introduce legislative proposals focusing on the accountability principle and oversight.

5.3.1.1 Overview of Ex Ante Regulation in Telecommunications Sector

The systematisation and Europeanisation of telecommunications was a cumbersome process. Domestic telecommunication infrastructures, standards, and networks run by Public Telecommunications Operators (PTOs) as part of or owned by states, constituted an impediment to the cross-border interoperability of modernised telecommunication networks and services necessary for EU economic development in the then emergent of Information Society.⁹⁷ Reform of domestic telecommunication regulations and infrastructures was, therefore, necessary to form a single telecommunications market.

Prior to the abovementioned ONP Directive, the Council issued a Recommendation calling for harmonisation in the field of telecommunications through

⁹⁷ Thatcher M, 'Winners and Losers in Europeanisation: Reforming the National Regulation of Telecommunications' (2004) 27 *West European Politics* 284.

technical standardisation⁹⁸ followed by the 1987 Green Paper.⁹⁹ The Green Paper orchestrated a dual strategy aimed at the liberalisation and harmonisation of all segments of the European telecommunications market. In general terms, the liberalisation of terminal equipment and services policies constituted one prong of this strategy, whereas harmonisation (following the re-regulation paradigm) of national regulations constituted the other.¹⁰⁰ It must be reiterated at this point that the creation of ETSI, proposed in the Green Paper, played an instrumental role in the harmonisation underpinning the EU-liberalisation strategy of telecoms. National technical standards served as a barrier to equipment and services market entry as they determined what equipment could connect to the networks controlled by state-owned network operators. The incumbent national operators, however, also dominated CEPT creating a great impediment to the introduction of harmonised standards.¹⁰¹ To that end, the Commission's initiatives for a harmonised standard setting were retrospectively fruitful and positively affected the harmonisation of telecoms.¹⁰²

Subsequent to the Green Paper, the Commission progressively reformed the electronic communications sector via re-regulation, ending the Member State's legal

⁹⁸ Council Recommendation (84/549/EEC) concerning the implementation of harmonization in the field of telecommunications (1984) OJ L 298/49.

⁹⁹ European Commission, Green Paper on the development of the common market for telecommunications services and equipment, COM(87) 290 final, 30 June 1987.

¹⁰⁰ For a thorough analysis of the policy reform on telecoms see Goodman JW, *Telecommunications policy-making in the European Union* (Edward Elgar 2006) Chapter 4.

¹⁰¹ Sandholtz W, 'Institutions and Collective Action: The New Telecommunications in Western Europe' (1993) 45 *World Politics* 242, 260.

¹⁰² As discussed throughout the study, conformity to essential requirements is presumed where a manufacturer conforms to the harmonised standards, developed by ESOs, as mandated by the Commission and published in the Official Journal of EU under the New Approach Directives. Thus, the essential EU regulation of ICT equipment for user and network safety and security, electromagnetic compatibility, efficient and safe use of spectrum, inter alia, despite liberalisation or deregulation, continues.

monopolies over equipment, services, and network supply.¹⁰³ Under Article 106(3) TFEU (ex 86(3) TEC) the Commission ordered Member States to withdraw any ‘special and exclusive rights’ from national telecommunications services providers concerning telecommunications terminal equipment.¹⁰⁴ This, however, did not happen without resistance from the Member States. A clash took place between the Member States and the Commission regarding the competence of the latter to issue such legislative measures. A small handful of Member States challenged these before the CJEU.¹⁰⁵ The CJEU upheld the Commission’s authority to issue such Directives relying on its competition law powers.

Europe, via three phases of ex ante, sector-specific frameworks forced Member States, via, inter alia, harmonised technical regulation, to roll back exclusive and special rights and privileges to provide telecommunications networks, equipment and services and open these markets to competition.¹⁰⁶ This applied first to equip-

¹⁰³ Commission Directive 88/301/EEC on Competition in the Markets in Telecommunications Terminal Equipment (1988) OJ L 131/73.

The establishment of independent National Regulatory Authorities (NRAs) contributed to the transformation process. These were co-ordinated under the European Regulators Group and now the Body of European Regulators of Electronic Communications (BEREC).

¹⁰⁴ See Walden I, ‘European Union Communications Law’ in Walden I (ed), *Telecommunications Law and Regulation* (Fifth edn, Oxford University Press 2018) 162-163; Schmidt SK, ‘Sterile Debates and Dubious Generalisations: European Integration Theory Tested by Telecommunications and Electricity’ (1996) 16 *Journal of Public Policy* 233; Schmidt SK, ‘Commission Activism: Subsuming Telecommunications and Electricity under European Competition Law’ (1998) 5 *Journal of European Public Policy* 169; Sandholtz W, ‘The Emergence of a Supranational Telecommunications Regime’, in Sandholtz W and Stone Sweet A (eds), *European Integration and Supranational Governance* (Oxford University Press 1998).

¹⁰⁵ Case C-202/88 *France v Commission* [1991] ECR I-1259; and Cases C271/90, C-281/90 and C-289/90 *Spain and Others v Commission* [1992] joined cases ECR I-5833. For an in-depth analysis see Larouche P, *Competition Law and Regulation in European Telecommunications* (Hart Pub 2000) Chapter 2.

¹⁰⁶ *Supra* note 104 in Walden I at 148-155.

ment, then value-added services and finally to voice services that intrinsically required the liberalisation of core networks, ultimately removing such ex ante controls where effective competition exists.¹⁰⁷ While the transformation of the telecommunications commenced in the 1980s,¹⁰⁸ a comprehensive regulatory framework for both liberalised and residual uncompetitive relevant markets was adopted in 2002 manifesting the near completion of liberalisation and incremental consolidation of a free-market system in electronic communications. The backbone of this new regulatory framework consisted of a package of Directives, aiming at promoting effective competition as well as the maximisation of consumer welfare through competition,¹⁰⁹

¹⁰⁷ Waverman L and Sirel E, 'European Telecommunications Markets on the Verge of Full Liberalization' (1997) 11 *The Journal of Economic Perspectives* 113; Ogus A, *Regulation — Legal Form and Economic Theory* (Oxford: Clarendon, 1994) 30-33.

¹⁰⁸ A range of factors contributed to the introduction of the new regulatory framework: technological, economic, social and political developments; regulatory reforms, namely privatisation, sought independently by Member States (England, France, and Germany); the shift of the view that telecommunications networks were natural monopolies; and the need for technical harmonisation. See Thatcher M, 'The Commission and National Governments as Partners: EC Regulatory Expansion in Telecommunications 1979–2000' (2001) 8 *Journal of European Public Policy* 558, 574; Thatcher M, *The Politics of Telecommunications: National Institutions, Convergence, and Change in Britain and France* (Oxford University Press on Demand 1999); Thatcher M, *The Europeanisation of Regulation: The Case of Telecommunications* (European University Institute 1999); Stehmann O, *Network Competition for European Telecommunications* (Oxford University Press 1995).

¹⁰⁹ These included the 'Framework Directive' (Council Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services, [2002] OJ L 108/33); 'Authorisation Directive' (Council Directive 2002/20/EC on the authorization of electronic communications networks and services [2002] OJ L 108/21); 'Access and Interconnection Directive' (Council Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities [2002] OJ L 108/7); 'Universal Services and User's Rights Directive' (Council Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services [2002] OJ L 108/7); 'Communications Privacy Directive' (Council Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector [2002] OJ L 201/37).

The regulatory framework was reformed, under the Commission's review proceedings, in 2009 with the amendment of the 2002 package and the adoption the 'Citizens' Rights' Directive (Council Directive 2009/136/EC amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services, Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector, and Regulation (EC) No 2006/2004 on cooperation between national authorities responsible for the enforcement of consumer protection laws [2009] OJ L 337/11); and the 'Better Regulation' Directive

coupled with sector-specific ex ante regulation limited to markets.¹¹⁰ Therefore, it is worth reviewing the three conditions that the Commission previously identified to necessitate an ex ante regulatory intervention in the electronic communications sector:

[t]he first criterion is the presence of high and non-transitory entry barriers whether of structural, legal or regulatory nature. [...] [T]he second criterion admits only those markets the structure of which does not tend towards effective competition within the relevant time horizon. [...] The third criterion is that application of competition law alone would not adequately address the market failure(s) concerned.¹¹¹

Regarding the first, static, criterion, structural barriers to entry exist when the market entry is prevented due to high sunk costs, substantial economies of scale, or a network element that cannot be reproduced.¹¹² These are barriers of economic

(Council Directive 2009/140/EC amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorisation of electronic communications networks and services [2009] OJ L 337/37).

In 2018, a revised framework for telecoms regulation was introduced, establishing the European Electronic Communications Code (EECC). This Code is part of the essential building blocks set out in the Digital Single Market strategy. See Directive (EU) 2018/1972 of the European Parliament and of The Council of 11 December 2018 establishing the European Electronic Communications Code (2018) OJ L 321/36.

¹¹⁰ The Commission initially identified 18 markets susceptible to ex ante regulation. However, it later reduced (phasing-out process) them to 7 and recently to 4. See Commission Recommendation (2003/311/EC) of 11 February 2003 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC, OJ L 114/45, 8 May 2003; Commission Recommendation (2007/879/EC) of 17 December 2007, OJ L 344/65, 28 February 2007; Commission Recommendation (2014/710/EU) of 9 October 2014, OJ L 295/79, 11 October 2014.

¹¹¹ European Commission Recommendation [2003/311/EC] of 11 February 2003 on Relevant Product and Service Markets within the Electronic Communications Sector Susceptible to Ex Ante Regulation in Accordance with Directive 2002/21/EC of the European Parliament and of the Council on a Common Regulatory Framework for Electronic Communication Networks and Services [2003] L 114 OJ/45 para 9.

¹¹² *Ibid* para 11; European Commission Recommendation (2014/710/EU), on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services Text with EEA relevance [2014] OJ L 295/79 para 12. See also *supra* note 104 Walden I at 173-178.

nature based on cost or demand conditions, whereas the legal or regulatory barriers result from legislative, administrative or other measures that prevent the entry to the market such as price controls.¹¹³ As to the second, dynamic, criterion, the barriers should be persistent and long-lasting. Lastly, the third criterion requires that ex ante regulation should be implemented when competition law remedies are insufficient to redress market failures. The three criteria should be applied cumulatively, otherwise, ex ante regulation is unnecessary.¹¹⁴

The introduction of ex ante regulation in electronic communications is based on competition law principles and is justified when effective competition is at risk due to the existence of significant market power (SMP) of an undertaking, effectively the equivalent of a dominant position.¹¹⁵ When assessing SMP of an undertaking, abuse of dominance is not required to be proven, but instead it suffices when an undertaking possesses “[...] sufficient market power to behave to an appreciable extent independently of its competitors, customers, and ultimately consumers.”¹¹⁶ The following implements the above criteria for ex ante intervention in the context of standard setting.

¹¹³ Ibid Recommendation 2003/311/EC para 12.

¹¹⁴ Ibid at para 16.

¹¹⁵ Article 14(2) of the Framework Directive provides that “an undertaking shall be deemed to have significant market power if, either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers.” Council Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services, [2002] OJ L 108/33; see also Commission Communication ‘Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services’ OJ 2018/C 159/12 para 52.

¹¹⁶ European Commission, Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services, (2018) OJ C 159/01, 07.05.2018, para 11.

5.3.1.2 Ex Ante Intervention in Standard Setting

Ex ante regulation could readily be rationalised in the case of standard setting. In this respect, the three-criteria test used for the ex ante regulation of telecoms industry could be adapted to the case of standard setting. Regarding the first criterion, although access to standards should be unrestricted, the problematic licensing framework of SEPs creates a chain of barriers in the SEP market.¹¹⁷ The explosion and over-declaration of SEPs, market concentration, royalty stacking, and unfair and unreasonable SEP licensing practices comprise structural barriers to new entrants.¹¹⁸ Indeed, in the case of patent holdup a SEP holder can unfairly control a standard by erecting unjustified barriers and controlling thereby the product market related to that standard.¹¹⁹ Sunk costs that manufacturers have made to produce standard-compliant products cannot be recovered locking them into the given standard. This can be seen in *Motorola* in which Motorola abused its dominance and via patent holdup blocked Apple's devices for a short-term from the smartphone market.

Further, there are indirect regulatory barriers in place in the ICT market. Adoption of harmonised standards satisfies the presumption of conformity with the essential requirements found in the New Approach Directives. Thus, manufacturers

¹¹⁷ The European Competitiveness and Sustainable Industrial Policy Consortium, 'Patents and Standards: A modern framework for IPR-based standardization' (2014) Section 4, 1, 109.

¹¹⁸ Jones A, 'Standard-Essential Patents: FRAND Commitments, Injunctions and the Smartphone Wars' (2014) 10 European Competition Journal 1, 3; Chappatte P, 'FRAND Commitments—The Case for Antitrust Intervention' (2009) 5 European Competition Journal 319, 325.

¹¹⁹ Schellingerhout R, 'Standard-setting from a competition law perspective' (2011) Competition Policy Newsletter 3, 7; European Commission, 'Guidelines on the Applicability of Article 101 of the Treaty On the Functioning of the European Union to Horizontal Co-Operation Agreements' (2011) OJ C11/01 para 269.

over the implementation of harmonised standards automatically ensure compliance with the EU law requirements to market their goods and services. It is particularly onerous, though, for manufacturers to build products that are not based on harmonised standards. Although the New Approach Directives set out essential requirements of conformity without restricting the entry to the market, they may become so when the adoption of non-harmonised standards could be time consuming and resource intensive (e.g., requiring prior authorisation and testing) inducing extensive sunk costs. Additionally, in the case of patent holdup this scenario is exacerbated. More specifically, SEP users who would wish to choose a non-harmonised standard to avoid a potential unfair agreement with a SEP holder may face a more cumbersome process to market their products. Thus, the New Approach Directives could indirectly prevent new entrants to enter the market.

In relation to the second criterion, there is a great uncertainty in the dynamics of SEP markets as there is a constant shift in the landscape of the competitors who strive to enhance their patent portfolios in order to license both SEPs and non-SEPs. Even market's tendency for effective competition would not suffice if the levels of effectiveness would not materialise within a defined timeframe.¹²⁰ Short-term and mid-term effective competition in the ICT standards market is doubtful. The arrival

¹²⁰ European Commission Staff Working Document, 'Explanatory Note, Accompanying the document Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services' SWD(2014) 298, 9.10.2014, 1, 10.

of the latest wireless telecommunications standard, 5G, would require increased cooperation between industry participants for its deployment which appears to be unlikely because of the patent wars that have begun between the tech-giants.

The case of Apple against Qualcomm illustrates the extent of these wars. Over the last two years, Apple launched legal actions against Qualcomm regarding the SEP licensing of (4G) LTE baseband chips and accused the latter for charging exorbitant licensing fees and for abusing its market power thereby.¹²¹ As discussed in Chapter 3, Qualcomm, in the meantime, has been sued by the FTC for anticompetitive practices¹²² and has been fined by the European Commission for abusing its dominance in 3G (UMTS) and more recently in 4G (LTE) baseband chipsets.¹²³ Nevertheless, Apple capitulated and agreed to settle the worldwide battle with Qualcomm, putting an end to the multibillion-dollar disputes.¹²⁴ This settlement was anything but unanticipated. This is because, during the time of these legal fights and since 2016, Apple dropped Qualcomm's baseband chips and incorporated instead

¹²¹ *Apple v Qualcomm*, [2017] US District Court of California, Case No. 17-cv-0108-GPC-MDD

¹²² FTC, 'FTC Charges Qualcomm With Monopolizing Key Semiconductor Device Used in Cell Phones' (2017) available at <https://www.ftc.gov/news-events/press-releases/2017/01/ftc-charges-qualcomm-monopolizing-key-semiconductor-device-used> accessed on 1 September 2019.

¹²³ European Commission, Press Release: Antitrust: Commission fines US chipmaker Qualcomm €242 million for engaging in predatory pricing, 18 July 2019, available at https://ec.europa.eu/commission/presscorner/detail/en/ip_19_4350 accessed on 1 September 2019; European Commission, Press Release: Antitrust: Commission fines Qualcomm €997 million for abuse of dominant market position, 24 January 2018, available at http://europa.eu/rapid/press-release-IP-18-421_en.htm accessed on 1 September 2019.

¹²⁴ The New York Times, 'Apple and Qualcomm Settle All Disputes Worldwide' (2019) available at <https://www.nytimes.com/2019/04/16/technology/apple-qualcomm-settle.html> accessed on 1 September 2019.

Intel's chips in its latest iPhone series.¹²⁵ Moreover, Apple sought to extend its collaboration with Intel to equip its forthcoming devices with Intel's 5G wireless baseband chips.¹²⁶ However, Intel failed to meet Apple's deadline for introducing 5G wireless baseband chips, which left Apple with no alternative but to settle with Qualcomm. Following the settlement, Intel abandoned development of 5G wireless baseband chips.¹²⁷ Yet, as Apple has recently acquired the majority of Intel's smartphone modem business, it suggests that Apple plans to produce its own wireless baseband chips in the future.¹²⁸

This dispute illustrates the distorted dynamics in competition of the ICT standards market with exclusionary practices, concentrated market power, and SEP disputes having strong ramifications on the market. Two key conclusions can be drawn from the above dispute between Apple and Qualcomm. First, that the market players are susceptible to manipulation by supra-dominant players due to the network and lock-in effects created by standardised technologies.¹²⁹ Indeed, Apple, one

¹²⁵ Cnet, 'Why Apple Wants Intel's Modem Business' (2019) available at <https://www.cnet.com/news/why-apple-wants-intels-modem-business/> accessed on 1 September 2019.

¹²⁶ Silicon, 'Apple Loses Confidence in Intel's 5G Chip Deadline – Report' (2019) available at <https://www.silicon.co.uk/mobility/4g/apple-intel-5g-deadline-243589> accessed on 1 September 2019.

¹²⁷ Intel, 'Intel to Exit 5G Smartphone Modem Business, Focus 5G Efforts on Network Infrastructure and Other Data-Centric Opportunities' (2019) available at <https://intel.ly/31dNzVv> accessed on 1 September 2019.

¹²⁸ Apple, 'Apple to acquire the majority of Intel's smartphone modem business' available at <https://www.apple.com/newsroom/2019/07/apple-to-acquire-the-majority-of-intels-smartphone-modem-business/> accessed on 1 September 2019.

¹²⁹ Baker JB, *The Antitrust Paradigm: Restoring A Competitive Economy* (Harvard University Press 2019) 171,172. Also, MacMahon highlighted that "[t]he possession of market power [...] provides greater opportunities for the firm to engage in conduct that is more damaging to the competitive process and more likely to result in reduced output and higher prices. Conduct such as predatory pricing is generally a rational strategy only for a firm with market power, because only a large firm is likely to be in a position to expand output and have the ability to recoup its investment." See McMahon K, 'A Reformed Approach to Article 82 and the Special Responsibility not to Distort Competition' in Ariel Ezrachi (ed) *Article 82 EC – Reflections on its Recent Evolution* (Hart 2009) 122.

of the top tech-companies, realised that there was a substantial risk for a delay to market 5G-compliant smartphones by 2020. Without Qualcomm's wireless baseband chips, Apple would have seen its market share shrink in contrast to its main competitors, Samsung and Huawei, who develop 5G wireless baseband chips with their own capacity and have recently released 5G-compliant smartphones. Therefore, it is apparent that Apple had to give up the legal fight with Qualcomm to ensure its market viability.¹³⁰

The second key point is that new market players have reduced opportunities to enter and survive in the market. It comes, therefore, with no surprise why Intel decided to shut down its business on manufacturing 5G wireless baseband chips following the outcome of the settlement between Apple and Qualcomm. The end of Intel's business might be viewed as the "collateral damage" of this fight. However, it is more appropriate to attribute this to the general problem of concentrated market power, as discussed below. Also, Apple's acquisition of Intel's business is another instance of concentration of market power enabling it to build its own chips in the future similar to its rivals, i.e. Samsung and Huawei. It appears, therefore, that in the future each of these tech-giants will develop their own chips to avoid unfair SEP charges. This will result in the creation of ICT companies operating at all levels of production, upstream and downstream, concentrating even greater market power and various business models with a wide coverage of products and services.

¹³⁰ Stratfor, 'Qualcomm Ends Its Fight With Apple, but an Antitrust Threat Still Looms' (2019) available at <https://worldview.stratfor.com/article/qualcomm-ends-legal-disputes-apple-china-threat-still-looms> accessed on 1 September 2019.

This is especially problematic from a competition law perspective as supra-dominant companies like Qualcomm, exploiting the power of SEPs, could place upstream or vertically integrated firms in peril through their exclusionary/exploitative practices. Such conduct harms not only competitors but also ultimately affects consumers. As Kokkoris has noted “a conduct which harms competitors in the long term may also harm consumers.”¹³¹ This view also has been affirmed by the DG, Competition, Johannes Laitenberger, commenting on the *Qualcomm* that: “[Qualcomm’s] conduct also denied consumers choice and harmed innovation in a sector with huge potential for innovative technologies.”¹³² Such opportunistic behaviour stifles competition, increases the costs, and, thereby, limits innovation posing a great threat not only to the manufacturing of 5G compliant-products but also to the consumers’ choice.

The last criterion of ex ante regulation considers the adequacy of ex post enforcement, i.e. competition law remedies, to resolve the market failure without ex ante regulation. In the case of standard setting, competition law remedies (i.e. investigations, prohibition decisions, fines, settlement/binding agreements) may address the abuse of dominance in the market ex post. Nevertheless, ex post enforcement should be complemented with ex ante regulation to effectively mitigate market failures, i.e. monopolistic practices and strategic behaviours of SEP holders, harming the consumers short- and long-term and hampering the competition process.

¹³¹ Kokkoris I, ‘Is there a Gap in the Enforcement of Article 102?’ in Etro F and Kokkoris I (eds), *Competition Law and the Enforcement of Article 102* (Oxford University Press 2010) 141.

¹³² Johannes Laitenberger, Director-General for Competition, European Commission, ‘Enforcing EU competition law in a time of change: “Is Disruptive Competition Disrupting Competition Enforcement?”’ (W@competition Conference, Brussels, 1 March 2018) http://ec.europa.eu/competition/speeches/text/sp2018_03_en.pdf accessed on 1 September 2019.

As outlined above, the largest tech-companies have amassed excessive market power and market share over time. Based on the Strategy Analytics report, this can be illustrated briefly by the current smartphone market shares: Samsung is on the top of the list with 22.3% of market share (shipping 76.3 million smartphones worldwide); Huawei scored at the second place in the list with a 17.2% (shipping 58.7 million smartphones worldwide); and Apple reached the third place with 11.1% (shipping 38 million smartphones worldwide).¹³³ In terms of the smartphone Operating System (OS) market share, in 2019, Android reached 86.7% whereas iOS (Apple's OS) accounts for only 13.3%.¹³⁴ It is clear that a duopoly exists in the mobile operating system market. These numbers are indicative of the concentration that is trending in the smartphones market. Patent activities can be a key element of market concentration in the ICT sector, especially when these activities are coupled with opportunistic practices.¹³⁵ In the context of SEPs, market concentration and market power could be readily enhanced where there is a handful of companies who own the biggest number of SEPs in the wireless telecommunications standards as this study has previously discussed.¹³⁶

¹³³ Note that the metrics regard the Q2 2019. See Strategy Analytics, 'Strategy Analytics: Huawei Takes 17 Percent Share of Global Smartphone Market in Q2 2019' (2019) available at <https://news.strategyanalytics.com/press-release/devices/strategy-analytics-huawei-takes-17-percent-share-global-smartphone-market-q2-2> accessed on 1 September 2019.

¹³⁴ International Data Corporation (IDC), 'Smartphone Market Share' (2019) available at <https://www.idc.com/promo/smartphone-market-share/os> accessed on 1 September 2019.

¹³⁵ Sampath PG and Park W, 'Do Patents Lead to Market Concentration and Excess Profits?' (2019) Global Development and Environment Institute Working Paper No. 19-02 1, 15.

¹³⁶ See 3.4.3; See also Pohlmann T and Blind K, *Landscaping study on Standard Essential Patents (SEPs)* (IPlytics GmbH, Technical University of Berlin, 2016).

Recently, scholars and policy-makers have expressed concerns regarding the alarming trend of market concentration which has been on the rise.¹³⁷ This trend reflects great considerations for the future of competition.¹³⁸ For example, the declining number of new firms (start-ups) and the decrease of economic dynamism that could ultimately lead to stagnation.¹³⁹ Some calling for a reform of the competition law enforcement and the adoption of regulatory measures,¹⁴⁰ and others for the breakup or the structural separation of the big dominant tech-giants following

¹³⁷ Organisation for Economic Co-operation and Development (OECD), 'Market Concentration: Issues paper by the Secretariat' (2018) DAF/COMP/WD(2018)46 3 available at [https://one.oecd.org/document/DAF/COMP/WD\(2018\)46/en/pdf](https://one.oecd.org/document/DAF/COMP/WD(2018)46/en/pdf) accessed 1 September 2019; Stiglitz JE, 'Towards a broader view of competition policy' (2017) Competition Policy for the New Era: Insights from the BRICS Countries 4, 16; Calligaris S, Criscuolo C and Marcolin L, 'Mark-ups in the digital era' (2018) 10 OECD Science, Technology and Industry Working Papers 1; Diez MF, Leigh MD and Tambunlertchai S, 'Global market power and its macroeconomic implications' (2018) 137 IMF Working Papers; Diez MFJ, Fan J and Villegas-Sánchez C, 'Global declining competition' (2019) 82 IMF Working Papers; Economist, 'A Giant Problem: The Rise of the Corporate Colossus Threatens Both Competition and the Legitimacy of Business' (2016) available at <https://www.economist.com/leaders/2016/09/17/a-giant-problem> accessed on 1 September 2019; Wu T, *The Curse of Bigness: Antitrust in the New Gilded Age* (Columbia Global Reports 2018); Hovenkamp HJ, 'Is Antitrust's Consumer Welfare Principle Imperilled?' (2019) Faculty Scholarship at Penn Law 1985.

¹³⁸ Digital Competition Expert Panel, 'Unlocking Digital Competition' (2019) 1, 24 available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf accessed on 1 September 2019.

¹³⁹ The European Centre for International Political Economy (ECIPE), 'Standing Up for Competition: Market Concentration, Regulation, and Europe's Quest for a New Industrial Policy' (2019) 1, 6.

¹⁴⁰ Digital Competition Expert Panel, 'Unlocking Digital Competition' (2019) 1, 24 available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf accessed on 1 September 2019; Crémer J, de Montjoye Y, Schweitzer H, 'Competition policy for the digital era' (2019) Report for the European Commission 1, 126; France and Germany joined forces and published 'A Franco-German Manifesto for a European industrial policy fit for the 21st Century' in which they contemplate a revised framework of competition law rules. See 'A Franco-German Manifesto for a European industrial policy fit for the 21st Century' available at https://www.bmwi.de/Redaktion/DE/Downloads/F/franco-german-manifesto-for-a-european-industrial-policy.pdf?__blob=publicationFile&v=2 accessed on 1 September 2019.

the telecommunications paradigm.¹⁴¹ This present study claims that there are alternatives to the breakup of companies of sheer size involved in standard setting. Instead, regulatory mechanisms could delineate a better and more robust licensing framework of SEPs even if big-tech companies hold a substantial number of SEPs. The key issue here is not the size of the companies as such, but the misconduct of big-tech companies (*de lege lata* competition authorities should protect effective competition and not competitors).¹⁴²

Although competition law enforcement is fundamental for the functioning of ICT standards market, it is not suitable to identify the emergence of exclusionary or exploitative strategies *ex ante*. Even when opportunism is detected *ex post*, competition law enforcement is a time-consuming and fact-based process that takes years and fails to keep pace with anticompetitive practices, and to timely correct and restore equilibrium in the market. This happens mainly for the reason that the enforcement mechanisms are problematically slow and asynchronous compared to the adoption of standards that dominate the market. The lockup of a standard results in the lockup of the market. Thus, SEP holders become gatekeepers of a standard. Transaction costs stemming from switching and complexity are unbearable for SEP

¹⁴¹ Taschdjian M and Alleman J, 'Antitrust Failures: The Internet Giants' (International Telecommunications Society (ITS) 2018) 1, 9 available at <http://hdl.handle.net/10419/184969> accessed 1 September 2019; Rodrigues CA, "Digital Gangsters" Are Big Tech Giants Challenging Democracy?' (2019) 11 Amsterdam Law Forum 12, 34-35; Crandall RW, 'The Dubious Antitrust Argument for Breaking Up the Internet Giants' (2019) 54 Review of Industrial Organization 627; Lamoreaux NR, 'The Problem of Bigness: From Standard Oil to Google' (2019) 33 Journal of Economic Perspectives 94.

¹⁴² This could also be linked with the concept of 'special responsibility' of dominant undertakings. This special responsibility is a negative conduct as a dominant undertaking is not allowed "to impair genuine undistorted competition on the common market". This could be even more apt in the case of supra-dominant undertakings. See McMahon K, 'Interoperability: "Indispensability" and "Special Responsibility" in High Technology Markets' (2007) 9 Tulane Journal of Technology and Intellectual Property 123; Whish R and Bailey D, *Competition Law* (Ninth edition edn, Oxford University Press 2018) 198.

users once they are locked into the standard making the adoption of standard an irreversible choice.

Considering this, close attention should be paid to the strategic behaviour of industry players initiated over the pre-standardisation phase even if the full manifestation of opportunism can take place during the licensing of SEPs (post-standardisation). SEPs confer a patent-based monopoly to their holders that is transformed later, in broad terms, to (supra)monopoly power.¹⁴³ Nevertheless, patent holdup can be attributed to a post-adoption harm but not to a pre-adoption one. Therefore, the underlying problem is that the SEP market is insufficiently supervised and the ex post enforcement is slow to capture the market dynamics that may lead to exclusionary or exploitative practices.

For example, when Motorola successfully obtained an injunctive relief against Apple in Germany, Apple suffered a temporary ban of the infringing products from its online stores.¹⁴⁴ However, it was found later by the Commission that Motorola abused its dominant power by seeking injunctive relief. Another useful example is that of Qualcomm. Qualcomm, for a prolonged period, earned substantial gains and market power through opportunistic practices (predatory pricing and payment grants) which took place between the years 2009 and 2016. However, the

¹⁴³ FOSSpatnets, 'Qualcomm's Two Mutually-Reinforcing Monopolies: SEP Thicket, Baseband Processor Chipsets' available at <http://www.fosspatents.com/2017/02/qualcomms-two-mutually-reinforcing.html> accessed on 1 September 2019.

¹⁴⁴ Case AT.39985 – *Motorola* at paras 316-317.

Commission only opened the proceedings in 2015.¹⁴⁵ During 2009 and 2015, Qualcomm doubled its revenue from \$10,387 to \$25,281 millions,¹⁴⁶ and in 2018 its market share accounted for 52%.¹⁴⁷ These prove that Qualcomm's market power can be attributed not only to its contributions to innovation but also to its anticompetitive practices, such as exclusionary or exploitative conduct by weakening rivals or even driving them out of the market. The imposition of the Commission's fines on Qualcomm may deter it from behaving anticompetitively short-term, however, there is no assurance that it will not use again such tactics in the future as the lifespan of SEPs last long enough to cover the next generations of wireless telecommunications standards. Past experience has shown that Qualcomm is resilient to any competition law enforcement consequences and its anticompetitive practices related to the licensing of SEPs is a recurring phenomenon.

The above analysis shows that the market concentration and the increasing phenomena of monopolistic conduct by SEP holders could irreversibly damage manufacturers, markets, the innovative process, and consumer welfare, resulting in market failures. Therefore, ex post remedies should be combined with regulation to ensure effective competition and secure specific policy outcomes. Although the ex ante regulation in telecommunications was applied to liberalise the market from the state-owned providers, the Commission can use this example in standard setting to

¹⁴⁵ European Commission, Press release - Antitrust: Commission opens two formal investigations against chipset supplier Qualcomm (2015) IP/15/5383.

¹⁴⁶ Macrotrends, 'Qualcomm Revenue 2006-2019' available at <https://www.macrotrends.net/stocks/charts/QCOM/qualcomm/revenue> accessed on 1 September 2019.

¹⁴⁷ BusinessWire, 'Strategy Analytics: Q1 2018 Baseband Market Share: Samsung LSI Overtakes MediaTek' available at <https://www.businesswire.com/news/home/20180731005614/en/Strategy-Analytics-Q1-2018-Baseband-Market-Share> accessed on 1 September 2019.

ensure that competition policy objectives are met. This can be achieved via the establishment of a monitoring mechanism that will scrutinise the accountability of both, ETSI and its members, which could be introduced with the revision of the legislative framework of the EU standardisation system. The following sections present a blueprint of such measures in a way of recommendations.

5.3.1.3 Administrative Oversight and Accountability

This section lays out how accountability and oversight can be reinforced in the framework of standard setting to hold ETSI and its members accountable for all the phases involved in the standardisation process under the watch of the Commission. It is important, however, to note that the concept of accountability is contestable and can take various forms and meanings with regard to the multi-level EU governance.¹⁴⁸

The Commission has used accountability in the context of standard setting to denote transparency, openness, and participation.¹⁴⁹ These three principles in addition to accountability and effectiveness consist the fundamental principles of

¹⁴⁸ Gerven Wv, *The European Union : A Polity of States and Peoples* (Oxford : Hart 2005); European Commission, European agencies – The way forward, COM(2008) 135 final.

¹⁴⁹ Report from the Commission to the Council and the European Parliament on Efficiency And Accountability In European Standardisation Under The New Approach, COM(1998) 291 final, 13.05.1998, 1, 4, para 8.

‘good governance’ issued with the Commission’s White Paper on ‘European Governance’.¹⁵⁰ However, all these principles relate to the ‘process accountability’ of decision making. In broad terms, ‘process accountability’ examines how and what decisions are taken, while ‘outcome accountability’ examines the results of the decisions.¹⁵¹ Thus, ‘process accountability’ can be understood as the evaluation of the procedures and methods used to arrive at a decision, and ‘outcome accountability’ is the evaluation on the effectiveness in the delivery of outcomes.¹⁵²

However, accountability is less straightforward in the agency relationship between the Commission and its agents.¹⁵³ In light of the agency relationship, this study posits that accountability should be stressed not only at the process level but also at the outcome.¹⁵⁴ The distinction between process and outcome accountability in the agency relationship is that the former is based on “[...] the various institutional mechanisms that govern the relationship between principals and agents” while the latter is based on the result of the agent’s actions.¹⁵⁵ In the present study, accountability is used in its narrower form where it “exists when a principal can use sanctions

¹⁵⁰ Specifically, the Commission explains accountability as follows: “Roles in the legislative and executive processes need to be clearer. Each of the EU institutions must explain and take responsibility for what it does in Europe. But there is also a need for greater clarity and responsibility from Member States and all those involved in developing and implementing EU policy at whatever level.” See European Commission, White Paper on European Governance, COM (2001) 428 final, 25.7.2001, 1, 7.

¹⁵¹ Shefali VP, Vieider F and Tetlock PE, ‘Process Versus Outcome Accountability’ in Bovens M and others (eds), *The Oxford Handbook of Public Accountability* (Oxford University Press 2014).

¹⁵² Häusser JA and others, ‘Effects of Process and Outcome Accountability on Idea Generation’ (2017) 64 *Experimental Psychology* 262; Fisher E, ‘The European Union in the Age of Accountability’ (2004) 24 *Oxford Journal of Legal Studies* 495, 497.

¹⁵³ Bovens M, ‘New Forms of Accountability and EU-Governance’ (2007) 5 *Comparative European Politics* 104, 111.

¹⁵⁴ *Supra* note 151.

¹⁵⁵ Bergman T, ‘Introduction: Delegation and Accountability in European Integration’ (2000) 6 *The Journal of Legislative Studies* 1, 3.

to prevent or punish undesirable behaviour by an agent.”¹⁵⁶ Indeed, this suggests a key question of who should be held accountable for the misconduct of ETSI members – the agent or the principal?

Despite that ETSI is an autonomous body established by the European Institutions, it is not officially considered, *stricto sensu*, a decentralised European agency.¹⁵⁷ However, as Gnes asserts, standard setting has a public function fulfilled by ESOs, including ETSI, and, therefore, they ought to be subject to public duties and administrative and/or judicial review.¹⁵⁸ This study concurs with this view and labels ETSI a “quasi-EU agency” since ETSI stands as an agent to its principal, the Commission.

As discussed in Chapter 3, the agency problem, in the context of ETSI standard setting, is linked to the accountability deficit of the agent requiring more effective supervision by the principal.¹⁵⁹ Everson et al stressed this issue, stating that: “[t]he [ESOs’] disadvantage is that the willingness of an SRO [self-regulatory organisation] to publicise and punish wrongdoers is likely to be less than that of a public regulator” suggesting that “[o]ne possible solution is a two-tiered system where a public agency acts chiefly as a regulator of regulators, with the SRO’s handling day

¹⁵⁶ Andersson S and Bergman T, 'Controlling Corruption in the Public Sector' (2009) 32 *Scandinavian Political Studies* 45, 46; Przeworski A, Stokes SC and Manin B, *Democracy, Accountability, and Representation*, vol 2 (Cambridge University Press 1999) 10; Koop C, 'Explaining the Accountability of Independent Agencies: The Importance of Political Salience' (2011) 31 *Journal of Public Policy* 209; Koop C, 'Theorizing and Explaining Voluntary Accountability' (2014) 92 *Public Administration* 565.

¹⁵⁷ For a list of the official EU agencies see https://europa.eu/european-union/about-eu/agencies/decentralised-agencies_en.

¹⁵⁸ Gnes M, 'Do Administrative Law Principles Apply to European Standardization: Agencification or Privatization?' (2017) *Legal Issues of Economic Integration* 367, 378-379.

¹⁵⁹ See 3.3.3.

to day rule-making and supervision.”¹⁶⁰ Further, Vos posited that “[...] the more active agencies become, the more important also the design of mechanisms to keep agencies under some control and make them accountable becomes.”¹⁶¹ This also has been the subject of discussion in the European Parliament where accountability and oversight of the EU regulatory agencies were reviewed calling “for more efficient coordination of agencies’ audits by the Commission, and highlight[ing] the need for a stronger and better structured system of reporting to the EP.”¹⁶² Therefore, both concepts, accountability and oversight, go hand in hand, and the Commission can be responsible to strike a balance between these two.

ETSI’s activities and number of ETSI members have been increasing over the years, hence, enhanced agency accountability is required. Although ETSI is responsible to ensure that a number of principles are met, such as openness, transparency, and participation,¹⁶³ it is not effectively held accountable for its member’s misconduct nor its passive failure to tackle its members’ opportunistic or strategic behaviour. In light of the examination carried out in Chapter 4, openness and transparency in ETSI’s procedures should be approached with scepticism. When the

¹⁶⁰ Everson M and others, ‘The Role of Specialised Agencies in Decentralising EU Governance: Report Presented to the Commission’ (1999) 1, 33.

¹⁶¹ Vos E, ‘Reforming the European Commission: What Role to Play for EU Agencies?’ (2000) *Common Market Law Review* 1113, 1126.

¹⁶² European Parliament, ‘Accountability of EU Regulatory Agencies’ (2015) available at [http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_ATA\(2015\)549017](http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_ATA(2015)549017) accessed on 1 September 2019. See also European Commission, Communication on European agencies – The way forward, COM(2008) 135 final, 11.3.2008. See also, European Parliament Resolution of 13 January 2004 on the Communication from the Commission: ‘The operating framework for the European Regulatory Agencies’, (2004) OJ C 92 E/119, at 123–4; European Parliamentary Research Service (EPRS), ‘EU Agencies, Common Approach and Parliamentary Scrutiny (Study)’ (2018) 1.

¹⁶³ Regulation 1025/2012 Annex II para 3; General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association of 28 March 2003, OJ 2003 C 91/7, section 4.

weighted voting system favours the premium members and special interests drive the pre-standardisation process, the principles of openness and transparency are undermined. It is unlikely, therefore, that ETSI complies with the ‘founding principles’ of the Regulation 1025/2012 spirit and should be held accountable.¹⁶⁴

The Commission, as the principal, that governs the standard setting has done little to monitor ETSI or hold it accountable for the problem of patent holdup that particularly arises in the licensing framework of SEPs under its IPR Policy. Since ETSI is a self-regulatory agency, it should be held accountable for the behaviour of its members. Based on the outcome accountability rationale, the Commission should demarcate, therefore, clear lines of accountability to govern ETSI’s actions post-delegation. Such measures would sufficiently establish the necessary preconditions for ETSI members’ conduct, thereby eliminating the potential of anticompetitive conduct of dominant players on an ex ante and proactive basis.

Two different methods could achieve a more efficient accountability and oversight outcome. First, the Commission could proceed with a more definitive approach and issue recommendations for revising the Regulation 1025/2012 on European Standardisation. Accountability measures could be applied within the text of Regulation with an individual provision on accountability as one of the fundamental

¹⁶⁴ Regulation 1025/2012, recital 2 and 11. Also, the Guidelines for co-operation demanded that: “The institutional rules of the European Standards Organisations should ensure that European standardisation, in particular where it supports European policies and Community regulation, remains fully accountable to all the interested parties in Europe, that is, that the standardisers take into account the broadest possible range of views in drawing up standards and other documents and that the procedures (during development, inquiry and voting) are open and transparent.” See General Guidelines for the Cooperation between CEN, CENELEC and ETSI and the European Commission and the European Free Trade Association of 28 March 2003, OJ 2003 C 91/7, section 4.

principles. This would be a broadly phased general clause and such an accountability provision could be phrased like:

“ESOs shall operate under the oversight of the Commission and shall be responsible for ensuring that their members’ actions and participation to the standardisation process are in line with the overarching objectives of public interest.”

Such a clause would stipulate scrutiny from both sides of the agency relationship. In this way, the Commission would establish a more efficient and continuous oversight of the operations of ETSI that would enable it to, if not fully prevent ETSI members’ capture of standard setting, limit them in doing so. This approach would also pave the way for the Commission to intervene on an ex ante basis to correct potential misalignment of the standardisation process with the public interest imperative. Overall, this measure would aim at the core of the agency problem, namely reduce the information asymmetries, but it may require the setup of a special committee within the Commission that would facilitate the supervisory role of the Commission as well as the process of scrutiny and continuous oversight of ETSI. Although this approach appears theoretically possible, it may be viewed as a political long shot.

Second, as will be discussed in the following section, the Commission can initiate an optional sector inquiry and an investigation procedure into ETSI, thereby holding it accountable for failure to implement specific procedural requirements against the risk of patent holdup, and to protect competition. By doing so, the Commission can then order ETSI to revise its IPR Policy and provide guidance to its members with a code of conduct.

5.3.2 Ex Post Approach: Revisiting ETSI IPR Policy and Voting System

It is no longer tenable that the Commission not demand the introduction of IPR rules that would deter SEP holders from opportunistic practices such as patent holdup. As noted in Chapter 2, the Commission previously opened an investigation into ETSI to examine whether its IPR Policy facilitated patent ambush during the standardisation process.¹⁶⁵ This was succeeded by another Commission investigation into Sun.¹⁶⁶ During this investigation, the Commission was concerned about Sun's potential breach of Article 81 EC (Article 101 TFEU) with the erection of artificial barriers to entry because of Sun's patent ambush tactics. Specifically, Sun declared an essential patent to the GSM standard; the Commission, in contrast, found it to be non-essential and ordered ETSI to remove it from its online IPR database.¹⁶⁷

In the aftermath of the *Sun*, the Commission launched an investigation into ETSI. The then Commissioner for Competition Policy Mario Monti stated that: "standard-setting bodies should devise their internal rules in such a way that these types of situations [patent ambush] cannot occur. In this respect, the Commission understands that ETSI is undertaking a review of the implementation of its own IPR

¹⁶⁵ Commission Press Release, Commission welcomes changes in ETSI IPR rules to prevent 'patent ambush', IP/05/1565.

¹⁶⁶ Ex-officio COMP/C-3/37926 *Sun/ETSI* (ETSI GSM 03.19 standard) (this Commission decision is unpublished). See also Contreras JL, 'Essentiality and Standards-Essential Patents' in Contreras JL (ed) *The Cambridge Handbook of Technical Standardization Law: Competition, Antitrust, and Patents* (Cambridge University Press 2017) 226.

¹⁶⁷ See SCTE Standards Bulletin, 'Fall 2003' available at http://www.scte.org/documents/standards/bulletin/SB_Fall_2003.htm accessed on 1 September 2019; Bekkers R, Iversen E and Blind K, 'Patent Pools And Non-Assertion Agreements: Coordination Mechanisms For Multi-Party IPR Holders In Standardization' (EASST 2006 Conference) available at https://www.researchgate.net/profile/Knut_Blind/publication/228637765_Patent_pools_and_non-assertion_agreements_coordination_mechanisms_for_multi-party_ipr_holders_in_standardization/links/0fcfd5114a752b4aba000000.pdf accessed on 1 September 2019.

rules, and stresses the need for this review to deliver effective results.”¹⁶⁸ This highlights how the risk of patent ambush was escalated by the Commission while also revealing that it adopted a strict stance against the issue of patent holdup then.¹⁶⁹ Although the Commission’s investigation was based on ex post enforcement, in practice, it functioned as an ex ante measure. This is because as soon as the Commission opened the investigation, ETSI amended its IPR Policy to protect the standard setters and users from patent ambush and to minimise potential violation of competition law rules.¹⁷⁰ Following the revision of ETSI’s IPR Policy the Commission dropped the investigation without the submission of commitments by ETSI.¹⁷¹

The above instance can serve as a precursor for another investigation regarding ETSI’s IPR Policy. This study maintains that ETSI could be steered into revisiting its IPR Policy with the initiation of an investigation by the Commission to address the risk of patent holdup. As a first step, the Commission could optionally conduct a sector inquiry of ICT standard setting. According to Article 17(1) of Regulation 1/2003, the Commission has the power to investigate a sector where there is a seeming restriction or distortion of competition.¹⁷² Sector inquiries enable the Commission to capture factual information about potential market failures or to gain a better

¹⁶⁸ Zingales N and Kanevskaia O, 'The IEEE-SA Patent Policy Update under the Lens of EU Competition Law' (2016) 12 *European Competition Journal* 195, 203.

¹⁶⁹ Schöler explains that “the Commission found that the disclosure of non-essential patents in relation to a standard had led to distortion of competition.” Schöler K, 'Patents and Standards: The Antitrust Objection as a Defense in Patent Infringement Proceedings' in Prinz zu Waldeck und Pyrmont and others (eds), *Patents and Technological Progress in a Globalized World: Liber Amicorum Joseph Straus* (Springer Berlin Heidelberg 2009) 1, 185.

¹⁷⁰ Vinje T, *The Intellectual Property and Antitrust Review* (Law Business Research 2016) 1, 46.

¹⁷¹ *Supra* note 165.

¹⁷² 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 [2003] L 1/1.

understanding of the competition conditions of a specific sector.¹⁷³ Importantly, such an inquiry does not lead to the adoption of remedies but only to optional release of reports on which interested parties can provide comments. In this case, a sector inquiry could be employed to identify potential restrictions on competition and the existence of market failure in standard setting. Regardless of the deployment of sector inquiry, the Commission, based on Article 18 of Regulation 1/2003,¹⁷⁴ can initiate an investigation *ex officio* on the basis to examine an alleged infringement of Article 101 TFEU.

Such an investigation can be justified on the grounds that the existing ETSI IPR Policy potentially restricts competition allowing its members to go against the principles of transparency and effective access via FRAND terms as delineated in the Horizontal Guidelines.¹⁷⁵ In addition, the Horizontal Guidelines require that SDOs should have “a clear and balanced IPR policy, adapted to the particular industry”¹⁷⁶ and “to ensure effective access to the standard”.¹⁷⁷ As established in the previous chapters, the ETSI standardisation process is seemingly compatible with the fundamental principle of transparency. However, this is disputable as technical contributors can materialise their strategic patenting during the pre-standardisation process and exploit also the ETSI weighted voting system. Premium ETSI members can then

¹⁷³ Supra note 142 in Whish R and Bailey D, 277.

¹⁷⁴ 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 [2003] L 1/1.

¹⁷⁵ Guidelines on Horizontal Cooperation Agreements, paras 280-286.

¹⁷⁶ Ibid at 284.

¹⁷⁷ Ibid at 285.

manipulate the standardisation process to effectively capture it and behave opportunistically foreclosing, thereby, the access to standards via illegitimate licensing practices, such as patent holdup. Since a handful of large tech companies dominate ETSI wireless telecommunication standards, there is a great need of a clearer IPR Policy that sets measures that effectively prohibit them from distorting competition. On this basis, an investigation could take place as ETSI's IPR Policy and structure are not entirely compatible with Article 101 TFEU and allow its members to erect artificial barriers to entry.

This action relies on ex post enforcement but is less drastic compared to the method analysed in the previous section, i.e. introduction of accountability and oversight measures. Yet, it is within the Commission's double capacity as not only the principal of standard setting but also the competition authority. Deploying such competition tools for mitigating patent holdup would be a more efficient and, perhaps, timely approach that would meet the strategic plan of the Commission to modernise standard setting and materialise the DSM. Investigation proceedings are not as time consuming as formal proceedings; they can create a powerful incentive for ETSI to amend its policies to safeguard the public interest in standard setting. This could also create an indirect pressure that functions as an accountability mechanism where ETSI, held accountable for its members' misconduct, proceeds with the improvement of its policies.

A revision of ETSI IPR Policy could provide sufficient protection for SEP users while serving the public policy objective in standard setting. As explained in the following, the focus of the revisions should be placed on the pre-standardisation phase and the post-standardisation/licensing of SEPs, where strategic behaviour and

opportunism can emerge. Clear requirements should be introduced in the ETSI IPR Policy for ETSI members to prevent strategic behaviour and patent holdup. The following recommendations can be used to develop targeted measures aimed at preventing patent holdup.

5.3.2.1 Essentiality Checks Requirement

In terms of the pre-standardisation process, the declaration of essential patents could be refined to provide a more transparent and fairer participation during the standard making process. The ETSI IPR Policy provides that the members should inform ETSI in timely fashion about the essentiality of any patented technologies submitted during the standardisation process.¹⁷⁸ However, the IPR Policy does not require any patent searches from the members.¹⁷⁹ This provision is particularly problematic for two reasons: first, it allows its members to declare a patent essential without the obligation to conduct evaluations on their patents on technical grounds to determine their indispensability to the standard; and second, there is the risk of overinclusion of patented technologies that are technically inferior to gain a status of essentiality.¹⁸⁰

While patent searches might be costly and slow the pre-standardisation processes,¹⁸¹ this should not be perceived as an obstacle but only as another layer of

¹⁷⁸ ETSI, ETSI Rules of Procedure: Annex 6: ETSI Intellectual Property Rights Policy, Section 4.1.

¹⁷⁹ *ibid* Section 4.2

¹⁸⁰ Maskus K and others, *Patent Challenges for Standard-Setting in the Global Economy: Lessons from Information and Communication Technology* (National Academies Press 2013) 41.

¹⁸¹ ANSI highlights the shortcomings regarding patent searches: "Patent searches are expensive, time-consuming, require a potentially complex legal and technical analysis and are still not dispositive.

filtering to distinguish patents that are technically meritorious and genuinely essential to the standard from those that are not. In addition, the patent search requirement would also function as a deterrent against strategic behaviours. In that way it would also complement the Commission's strategy to improve the database of declared essential patents. Thus, the overhaul of the SEPs database will be facilitated while becoming more efficient for SEP users to navigate it. Therefore, ETSI should introduce a requirement for members to conduct patent searches before claiming essentiality of patented technologies.

5.3.2.2 FRAND Scheme: Ex Ante Disclosure and FRAND Terms

Throughout, this study has noted that the ambiguity of FRAND terms has generated disparities in the negotiations of SEP licensing, leading to increased litigation between the SEP holders and users. Following the CJEU's *Huawei* test and Commission's clarification thereof, there remains uncertainty about the licensing of SEPs. As illustrated above, this is apparent from the Commission's initiative to improve the FRAND regime. While the Commission recently put forward valuation methods for FRAND royalties as a contingency against negotiation position disparities, it has not identified the need for reform of the ETSI IPR Policy. Notably, Advocate General Wathelet highlighted in his opinion in the *Huawei v ZTE* case that the Court should invite standardisation bodies "[...] to establish minimum condi-

This problem is exacerbated by the fact that the standard under development usually is evolving and its technical specifications are subject to change up until the final consensus ballot." ANSI, 'ANSI Comments in response to Public Consultation on proposed Guidelines for the assessment of horizontal cooperation agreements under EU competition law', (2010) file with the author.

tions or a framework of ‘rules of good conduct’ for the negotiation of FRAND licensing terms.”¹⁸² Although the CJEU ignored this invitation, the opinion of AG Wathelet expounds on the importance of establishing rules for the licensing of SEPs within standardisation bodies. Bekkers and Updegrave have, further, suggested that the task of defining FRAND terms is not a difficult one and could be done according to IPR goals of an SSO.¹⁸³

Despite the reluctance of ETSI to mediate disputes of FRAND licences, it has a responsibility to act against patent holdup and support negotiations between parties with the introduction of more efficient IPR policies. Based on this premise, ETSI could follow the lead of the IEEE to clarify FRAND terms as well as the VMEbus International Trade Association (VITA) to adopt ex ante disclosure policies. The IEEE has recently amended its policies to provide greater clarity on FRAND terms

¹⁸² The opinion continues: “Without these, not only actions for a prohibitory injunction but also the rules on abuse of a dominant position, which should be employed only as solutions of last resort, are being used as a negotiating tool or a means of leverage by the SEP-holder or the undertaking which implements the standard and uses the teaching protected by that SEP.” Opinion of Advocate General Wathelet, C-170/13 *Huawei Techs. Co. Ltd v. ZTE Corp.*, (2014) para 11.

¹⁸³ The authors put forward that: [...] providing a definition (which is not to say reaching consensus on a definition) would not be difficult. [...] if a primary goal of an IRP policy is to prevent hold-up, then a RAND compatible licensing fee could be defined as any fee up to the maximum fee the IPR holder would have been able to require before the technology was incorporated into a standard (the ex ante price), or perhaps the marginal price (the additional value of the standard after incorporating this technology). On the other hand, if the overall aim of the policy is to ensure that the aggregate licensing burden should not go beyond a certain point, then the policy could have a RAND definition directed at that goal.” See Bekkers R and Updegrave AS, *IPR Policies and Practices of a Representative Group of Standards-Setting Organizations Worldwide* (Committee on Intellectual Property Management in Standard-Setting Processes National Research Council, Washington, DC, 2013) 1, 103.

and safeguard the licensing of SEPs,¹⁸⁴ while VITA requires members to disclose their maximum royalty rates for SEPs.¹⁸⁵

Regarding the ex ante disclosure of licensing terms, the ETSI Directives could be enhanced further and include a provision that would allow the members to disclose their maximum royalty rates for SEPs before the adoption of a standard. Likewise, a recent report, prepared for the Commission, proposed that a voluntary disclosure of maximum royalty rates could be a practical solution to reduce the transaction costs of SEP licensing (such as royalty stacking).¹⁸⁶ Such a provision would be in compliance with the Commission's Horizontal Guidelines which point out that "standard-setting agreements providing for ex ante disclosures of most restrictive licensing terms, will not, in principle, restrict competition within the meaning of Article 101(1)."¹⁸⁷ This would have procompetitive benefits for the standard setting increasing transparency and information for the standard making process. Additionally, the problem of royalty stacking would be tackled within a framework that

¹⁸⁴ See 2.3.2.

¹⁸⁵ VITA was the first SSO to revise its Patent Policy from a voluntary to a mandatory requirement for members to declare maximum royalties in order to eliminate patent ambush. The US DoJ has provided clearance for the proposed amendments and the current form of the provision reads as: "Each WG Member must declare the maximum royalty rate for all patent claims that the VITA Member Company he or she represents (or its Affiliates) owns or controls and that may become essential to implement the Draft VSO Specification." VITA, 'VSO Policies and Procedures', (2015) 1, 11 para 10.3.2 available at <https://www.vita.com/resources/Documents/Policies/vso-pp-r2d8.pdf> accessed on 1 September 2019.

¹⁸⁶ Régibeau P, De Coninck R, and Zenger H, 'Transparency, Predictability, and Efficiency of SSO-based Standardization and SEP Licensing: A Report for the European Commission' (2016) 1, 84-85 and 89.

¹⁸⁷ European Commission, 'Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-Operation Agreements' (2011) OJ C11/01 para 299.

defines “maximum cumulative rate [for the standard] that could be reasonably envisaged or expected.”¹⁸⁸

The disclosure of maximum rates could offer more accurate decision making; clearer meaning of FRAND terms would help resolve the licensing hardships as well as the problem of royalty stacking. A definition of fair and reasonable terms can be inserted verbatim into ETSI IPR Policy as is already available under IEEE’s Patent Policy. This could be phrased like:

“Reasonable rate shall mean appropriate compensation to the patent holder for the practice of an Essential Patent Claim excluding the value, if any, resulting from the inclusion of that Essential Patent Claim’s technology in the Standard.”

Such a provision arguably encapsulates the Commission’s IP valuation principles, recently expressed in its Communication:

Licensing terms have to bear a clear relationship to the economic value of the patented technology. That value primarily needs to focus on the technology itself and in principle should not include any element resulting from the decision to include the technology in the standard. In cases where the technology is developed mainly for the standard and has little market value outside the standard, alternative evaluation methods, such as the relative importance of the technology in the standard compared to other contributions in the standard, should be considered.¹⁸⁹

The Commission’s IP valuation principles appear to be totally in keeping with the IEEE’s Patent Policy vis-à-vis the definition of reasonable terms. Hence, such a provision would be in agreement with the Commission’s principles and would fit the

¹⁸⁸ The European Commission, Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final, 29.11.2017, 1, 6, section 2.1.

¹⁸⁹ *ibid.*

competition law rules.¹⁹⁰ The advantage of including a precise definition of reasonable terms is to provide a better framework for SEP negotiations and create a minimum standard on which both SEP holders and implementers would rely.

To ensure compliance with the policies, the revised provisions should be accompanied by sanctions for members who violate the requirement of reasonable rates. This would enable ETSI to mitigate strategic behaviour of ETSI members. Currently, the ETSI IPR Policy provides a number of steps for the non-availability of licenses in the pre- and post-standardisation phase.¹⁹¹ A stronger way to safeguard the standardisation process is to introduce a prohibition for the SEP licensor to seek injunctive relief in the case of non-availability of licences (refusal to license) after the adoption of a standard. The adoption of a prohibitory provision would deter the ETSI members to behave opportunistically and would reinforce the principle of accessibility in standard setting preventing ETSI members from asserting SEPs for which they have provided irrevocable commitments to license on FRAND terms.

¹⁹⁰ Petit, however, expressed concerns over the adoption of similar provisions on European grounds claiming that they would not prevail under EU competition law rules while giving rise to antitrust liability under Article 101 TFEU. Yet, Zingales and Kanevskaia invalidate Petit's argument that the transposition of IEEE Patent Policy rules would likely fall foul Article 101 with the use of the safe harbour doctrine found in the Guidelines and the application of Article 101 (3) TFEU. See Petit N, 'The IEEE-SA Revised Patent Policy and its Definition of "Reasonable" Rates: A Transatlantic Antitrust Divide?' (2017) 27 *Fordham Intellectual Property, Media & Entertainment Law Journal* 211; and Zingales N and Kanevskaia O, 'The IEEE-SA Patent Policy Update under the Lens of EU Competition Law' (2016) 12 *European Competition Journal* 195.

¹⁹¹ ETSI, ETSI Rules of Procedure, Annex 6: ETSI Intellectual Property Rights Policy, Section 8, page 40-41.

5.3.2.3 ETSI Voting System

As analysed in Chapter 4, ETSI's weighted voting system can be manipulated by the largest members who can then influence and, in the worst-case scenario, control the standardisation process. ETSI is the only standards body that has a weighted voting system.¹⁹² That is likely more appealing to the high-earning technical contributors as they have a greater chance to sponsor and include their technologies into standards. Despite that the principle of consensus provides a safeguard for the decision making on standards, when the decision-making rests on the current voting system there is likelihood of the higher rank ETSI members, who possess more units, influencing the standard-making process in accordance with their self-interests.¹⁹³

The real culprit is that the market power and voting power of top ETSI members seemingly coincides. The effects of this suggest the likelihood of capture. To tackle this, ETSI should drop the weighted voting rights and adopt a new voting system that is fairer across the board and more inclusive of everyone that participates in the standard-making process. A majority voting system based on a "one voter – one vote" system would allow all technical contributors to equally influence the standardisation process. Such a voting system would mitigate the disproportional concentration of power to a few members and would enable an equitable distribution of power to all the participants of standard setting. Notwithstanding that in

¹⁹² Baron J and Spulber DF, 'Technology Standards and Standard Setting Organizations: Introduction to the Searle Center Database' (2018) 27 *Journal of Economics & Management Strategy* 462, 477.

¹⁹³ Bekkers R and Seo D, *Quick Scan for Best Practices in ICT Standardization: What ETSI Could Learn from other Standards Bodies* (Commissioned by the Directorate of Energy and Telecommunications, Dutch Ministry of Economic Affairs Utrecht, Netherlands: Dialogic, 2008) 1, 30.

practice a change of the voting system would discourage existing and future participants short-term, a new system will enhance openness and participation in ETSI free from concentration of power.

However, as ETSI is largely funded by members' contribution, a change in the voting system raises intriguing questions regarding the nature and extent of ETSI funding by its members. Since the membership fees determine the number of units and weights of voting rights, the different tiers of fees would be devoid of meaning with the retracting of the weighted voting and units' system. The design of a new funding system is an important area for future research.

5.4 Conclusion

The chapter focused on the Commission's current steps to improve the European Standardisation system. It demonstrated the current policy plans and strategies of the Commission to modernise standard setting regime for the DSM in an effort to prepare the seamless adoption of 5G and other emerging technological advancements. The Commission through a set of initiatives aspires to correct various shortcomings in the standard setting, including the FRAND licensing issues, SEP enforcement, and SEP declaration database. However, in its Communication, the Commission has waived the responsibility of SDOs to take corrective measures regarding their standardisation policy.

The current ETSI IPR Policy fails to sufficiently prohibit anticompetitive practices and tackle patent holdup. What was sought in this Chapter was a framework that would allow such a balancing while improving the co-regulatory regime

in standard setting. The recommendations laid out in this Chapter aim to the mitigation of the issue of patent holdup and regulatory capture via a combination of ex ante and ex post regulatory measures.

As discussed above, with an ex ante regulatory intervention the Commission could propose the revision of the Regulation 1025/2012 and the adoption of a provision that would introduce another fundamental principle that of accountability of ESOs. Also, such a principle would deal with a part of the issue which lies in the fact that ETSI is not held accountable neither for the outcome of the standardisation process nor for its members' conduct. Further, the suggested amendment will reiterate conformity to the public policy objectives. In combination with the accountability principle, the Commission should establish better oversight of ETSI to effectively and closely monitor the standard making process where market concentration is noticeable. However, these measures should be accompanied with a revised framework of the ETSI IPR Policy.

In order to correct the errors of ETSI IPR Policy, the study puts forward that the Commission could launch, if necessary, a sector investigation into ETSI's standard setting to identify for potential market failures and distortion in the ICT standards market arising from ETSI's policies. Irrespective of the sector inquiry, the Commission could launch an investigation at its own initiative to activate the process of revision of ETSI IPR policy. The study offers a twofold revision of ETSI at a policy and organisational infrastructure level. In relation to policy level the study posits that essentiality checks of patents should become a requirement for technical contributors in order to minimise the risk of over-declaration for patents that are not indispensable to the practice of a standard. This would function as an additional

layer of protection against the technology contributors whose seek to participate in standard setting for strategic purposes.

In addition to essentiality checks, the ETSI IPR policy could incorporate a clearer definition of FRAND terms following the IEEE model. With such a definition, both SEP holders and users should be able to negotiate on fairer grounds the licensing fees for FRAND-encumbered patents. The IPR policy could also accommodate a provision that would enhance the ex ante disclosure of licensing terms and allow the disclosure of maximum royalty rates. This would allow standard setters to select technologies with hindsight precluding royalty stacking phenomena. Lastly, the weighted voting system of ETSI creates unjustified inequalities among the technical contributors. Therefore, a voting system that would not discriminate among the members would prevent the large tech-companies to capture and manipulate standard setting.

Although these regulatory actions could be considered authoritative and firmer as opposed to the better regulation paradigm, the study deems them necessary to remedy the issue of patent holdup in the standard setting regime. The proposed methods would benefit and contribute to the improvement of standard setting by hindering the members from inexorably capturing via strategic and opportunistic behaviour the standard making process.

From a regulatory standpoint, the usefulness of these methods could serve as an interim instrument to correct the failure of the co-regulatory regime to prevent the inter- and intra-capture of the agency relationship between the Commission and ETSI. Eventually, this could become the basis to prevent the gradual deviation of

ETSI from serving and securing public interest inherent to the standardisation process.

6 CONCLUSIONS

The co-regulatory mode of standard setting has been of paramount importance for the formation of the European Single Market. However, with the rapid technological change, market concentration, and the increased tension that has emerged between patents and standards, the EU ICT standardisation system is undergoing a crisis. Hence, strategic and opportunistic behaviours have surfaced with patent holdup becoming the epicentre of strategic use of SEPs posing grave repercussions.

The Competition Commissioner, Margrethe Vestager, in referring to the danger of patent holdup, concluded that: “[...] mobile technology doesn’t stand still. As 5G technology develops, together with the Internet of Things, more and more products will be connected to each other. And to make sure that happens in a way that works for consumers, there needs to be fair access to standards, and a reward for genuine innovators.”¹ Commissioner Vestager’s talking points suggest that patent holdup remains a great threat to the standardisation and the consumers, despite the attempts of the Commission and the judicial review to confront the issue. With

¹ Vestager M, ‘Protecting consumers from exploitation’, Chillin’ Competition Conference’, Brussels, 21 November 2016 available at https://ec.europa.eu/commission/commissioners/2014-2019/vestager/announcements/protecting-consumers-exploitation_en

the gradual adoption of 5G and the emergence of new frontiers to smartphone market, a new era of smartphone patent wars has begun.² However, the EU standardisation regime falls short of addressing patent holdup and therefore it is necessary to develop workable action mechanisms.

The thesis aimed to test the hypothesis of whether the co-regulatory regime of EU ICT standard setting can sufficiently prevent patent holdup in the standardisation process. The thesis, as described in Chapter 2, emerged from the examination of patent holdup and ancillary theories and the current standardisation policy framework consisting of the soft-law mechanisms as well as the competition law framework, and antitrust cases identifying deficiencies and loopholes in regulating patent holdup. These deficiencies subsequently led the analysis to the questioning of the regulatory system of standard setting.

Chapter 3 scrutinised the co-regulatory mode of standard setting between the Commission and ETSI under the theories of regulation and primarily the principal-agent theory. It argued that patent holdup, and in broad terms opportunism and strategic behaviour, is concomitant with the agency capture and agency problem. It promoted a holistic approach to the conceptualisation of the agency capture; whereby public interest of standard setting is undermined by SEP holders, i.e., those members of ETSI that behave strategically to serve their self-interests, despite their

² Weissberger A, '5G Patent Licensing Wars Begin: Nokia undercuts Ericsson and Qualcomm on royalties for 5G smartphones' (2018) <<http://techblog.comsoc.org/2018/08/22/5g-patent-licensing-wars-begin-nokia-undercuts-ericsson-and-qualcomm-on-royalties-for-5g-smartphones/>> accessed on 1 September 2019; Trappey CV, Trappey AJC and Wang Y-H, 'Are Patent Trade Wars Impeding Innovation and Development?' (2016) 46 *World Patent Information* 64.

participation in the standard making process. The concept of agency capture discussed herein provided a unique perspective of patent holdup as a form of capture, facilitating the identification of the regulatory shortcomings of the standard setting regime.

The thesis, in Chapter 4, built on the concept of a two-level capture: intra-capture of the agent, namely the capture of ETSI by its members; and inter-capture, the capture of the Commission by ETSI resulting from intra-capture. Intra-capture was established based on three main rationales: a) the ETSI weighted voting system; b) the self-interests of technology contributors overtaking the standard making process; and c) the adoption of the ETSI IPR Policy that favours and serves the interests of its members. In conjunction with intra-capture, the inter-capture of the Commission, the principal of standard setting, was detected using agency problem rationales. Information asymmetries and goal conflict were found between the agent and the principal with moral hazard and opportunism detected. The thesis demonstrated that both intra- and inter-capture are detrimental to standard setting.

In Chapter 5, the thesis posited that accountability mechanisms via ex ante regulatory intervention by the principal would advance standard setting and serve as a means to re-shape co-regulation in order to limit capture and correct market failure in standard setting. Although the Commission's strategic plans and priorities for the DSM should lead to the overhauling of the European standardisation policy, nonetheless, the analysis has shown that there is a regulatory impotency to deal with the intra-capture of ETSI. As has been argued, the employment of better regulation

mechanisms has produced dismal results and, therefore, command-and-control deterrence mechanisms would be more apt to rectify the regulatory capture and seeming market failure.

The proposed regulatory and policy measures for the prevention of patent holdup and capture in standard setting ultimately need to strike a balance between the following elements: first, the increasing tension of patents and standards; second, self-interests of ETSI members and public interest pertaining to standardisation policy; and third, effective competition and access to standards. Due account also needs to be given to creating a framework that would assure accessibility to standards across the standardisation stages through the monitoring of ETSI and its members. Therefore, the analysis focused on increasing the accountability of ETSI with the introduction of an accountability requirement into the Regulation 1025/2012 on European Standardisation and a set of policy and structural revisions into ETSI's voting system and IPR Policy.

The proposals advanced in this thesis are theoretically grounded and can serve as useful points of comparison with any proposals in this field. Throughout the analysis, the drawbacks of the European standardisation policy, raised by the scholarship, the competition authorities, and the industry, were underlined. This thesis, however, offered a profound analysis on the interpretation of patent holdup based on theories of regulation complementing the vast scholarship in this field. In this thesis, it has been argued that more rigorous controls on ETSI should be implemented. Even if that has not been applied to date, it has at least led to certain concrete proposals, thereby provoking further discussion.

The expressed opposition to the lax stance of ETSI against those members who either refuse to license their SEPs on FRAND terms or they have been behaving strategically or/and opportunistically has been very accurately described with regard to intra-capture. Importantly, for the completion of the DSM, the consolidation and the reinstatement of the pro-competitive benefits of standard setting, this thesis submits that private interests should be counterbalanced and puts forward concrete proposals to steer EU standardisation policy in accord to public policy and public interest objectives. The competence of the Commission to adopt these proposals is assessed, and it is concluded that the Treaty framework does indeed permit the adoption of these measures at the EU level. The proposals set out practical and promising approaches for the improvement of the European standardisation system safeguarding the standardisation principles, without undermining SEP holders' incentives and technology innovation.

BIBLIOGRAPHY

Books

- Anderson JE and Redford ES, *The Emergence of the Modern Regulatory State* (Public Affairs Press 1962)
- Armstrong K and Bulmer S, *The Governance of the Single European Market* (Manchester University Press, 1998)
- Arrow KJ, *Essays in the Theory of Risk-Bearing* (North Holland Publishing 1971)
- Ayres I and Braithwaite J, *Responsive Regulation: Transcending the Deregulation Debate* (Oxford University Press 1995)
- Baker JB, *The Antitrust Paradigm: Restoring a Competitive Economy* (Harvard University Press 2019)
- Baldwin R, Cave M and Lodge M, *Understanding Regulation: Theory, Strategy, and Practice* (2nd edn, Oxford University Press 2012)
- Bardach E and Kagan RA, *Going by the Book: The Problem of Regulatory Unreasonableness* (Routledge 2017)
- Barney JB and Ouchi WG, *Organizational economics* (1st edn, Jossey-Bass 1986)
- Batura O, *Universal Service in WTO and EU Law: Liberalisation and Social Regulation in Telecommunications* (1st edn, T.M.C. Asser Press 2016)
- Bekkers R, *Mobile Telecommunications Standards: GSM, UMTS, TETRA, and ERMES* (Artech House 2001)
- Bekkers R, *The Development of European Mobile Telecommunications Standards: An Assessment of the Success of GSM, TETRA, ERMES and UMTS* (Technische Universiteit Eindhoven 2001)
- Bernstein MH, *Regulating Business by Independent Commission* (Princeton University Press Princeton 1955)
- Bignami F and Zaring D, *Comparative Law and Regulation* (Edward Elgar Publishing 2016)
- Busch L, *Standards: Recipes for Reality* (MIT Press 2011)
- Busuioc EM, *European Agencies: Law and Practices of Accountability* (Oxford University Press 2013)
- Cargill C and Bolin S, 'Standardization: A Failing Paradigm' in Greenstein S and Stango V (eds), *Standards and Public Policy* (Cambridge University Press 2006)
- Carpenter D and Moss DA, *Preventing Regulatory Capture: Special Interest Influence and how to Limit it* (Cambridge University Press 2013)
- Chalmers D, Davies GT and Monti G, *European Union Law: Cases and Materials* (2nd edn, Cambridge University Press 2010)
- Coleman JS, *Foundations of Social Theory* (The Belknap Press of Harvard University Press 1994)

- Cooter R and Ulen T, *Law and Economics*, (3rd edn, MA: Addison-Wesley Longman 2000)
- Cornes R and Sandler T, *The Theory of Externalities: Public Goods, and Club Goods* (Cambridge University Press 1986)
- Cournot AA and Bacon NT, *Researches into The Mathematical Principles of The Theory of Wealth* (Macmillan 1897).
- Cowen T, *Public Goods and Market Failures: A Critical Examination* (Transaction Publishers 1992)
- Davies GT, *EU Internal Market Law* (2nd ed., Cavendish 2003)
- Downs A, *Inside Bureaucracy* (Second edn, Little, Brown & Co 1967)
- Egan M, *Regulating European markets: Mismatch, reform and agency* (ProQuest Dissertations Publishing 1996)
- Emerson M, *The Economics Of 1992: The E.C. Commission's Assessment of The Economic Effects of Completing the Internal Market* (Oxford University Press 1988)
- Epstein D and O'Halloran S, *Delegating Powers: A Transaction Cost Politics Approach to Policy Making under Separate Powers* (Political Economy of Institutions and Decisions, Cambridge University Press 1999)
- Farr S, *Harmonisation of Technical Standards in the EC* (John Wiley & Sons, 1996)
- Foster CD, *Privatization, Public Ownership and the Regulation of Natural Monopoly* (Blackwell 1992)
- Gerven Wv, *The European Union: A Polity of States and Peoples* (Oxford: Hart 2005)
- Goodman JW, *Telecommunications policy-making in the European Union* (Edward Elgar 2006)
- Hatzopoulos V, *Regulating Services in the European Union* (Oxford University Press 2012)
- Hofmann HCH, Rowe GC and Türk AH, *Administrative Law and Policy of the European Union* (Oxford University Press 2011)
- Hood C, *Explaining Economic Policy Reversals* (Buckingham 1994)
- Hughes OE and Dawsonera, *Public Management and Administration: An Introduction* (3rd edn, Palgrave Macmillan 2003)
- Jakobs K, *Advanced Topics in Information Technology Standards and Standardization Research* (Idea Group Pub 2006)
- Jordana J and Levi-Faur D, *The Politics of Regulation: Examining Regulatory Institutions and Instruments in The Age Of Governance* (Edward Elgar 2004)
- Kai J, *Modern Trends Surrounding Information Technology Standards and Standardization within Organizations* (IGI Global 2015)
- Kiewiet DR and McCubbins MD, *The Logic Of Delegation: Congressional Parties and the Appropriations Process* (University of Chicago Press 1991)

- Laffont JJ, *Fundamentals of Public Economics* (MIT Press 1987)
- Larouche P, *Competition Law and Regulation in European Telecommunications* (Hart Pub 2000)
- Lindblom CE, *Politics and Markets: The World's Political-Economic Systems* (Basic Books 1977)
- Lodge M and Wegrich K, *Managing Regulation: Regulatory Analysis, Politics And Policy* (Palgrave Macmillan 2012)
- Lovecy J, *The Transformation of Governance in the European Union* (Routledge 2003)
- Majone G and others, *Regulating Europe* (Routledge 1996)
- Majone G, *Deregulation or Re-regulation?: Policymaking in the European Community since the Single European Act* (European University Institute 1993)
- Majone G, *Dilemmas of European Integration* (Oxford University Press 2005)
- Majone G, *Independent Agencies and the Delegation Problem: Theoretical and Normative Dimensions' in Political Institutions and Public Policy* (Springer 1997)
- Majone G, *Temporal Consistency and Policy Credibility: Why Democracies Need Non-Majoritarian Institutions* (European University Institute 1996)
- Maskus K and others, *Patent Challenges for Standard-Setting in the Global Economy: Lessons from Information and Communication Technology* (National Academies Press 2013)
- Meade JE, *The Theory of Economic Externalities: The Control of Environmental Pollution and Similar Social Costs* (Sijthoff Institut Universitaire de Hautes Etudes Internationales 1973)
- Milgrom P and Roberts J, *Economics, Organization and Management* (International edn, Prentice-Hall 1992)
- Mitnick BM, *Corporate Political Agency: The Construction of Competition in Public Affairs* (Sage 1993)
- Morgan B and Yeung K, *An Introduction to Law and Regulation: Text and Materials* (Cambridge University Press 2007)
- Musgrave RA and Musgrave PB, *Public Finance in Theory and Practice* (International student edn, McGraw-Hill Kogakusha 1973)
- Nazzini R, 'The Objective of Article 102', *The Foundations of European Union Competition Law* (Oxford University Press 2011)
- Niskanen WA, *Bureaucracy and Representative Government* (Aldine-Atherton 1971)
- Noam EM, *Telecommunications in Europe* (Oxford University Press 1992) 62
- Ogus A and Carbonara E, 'Self-regulation' *Production of Legal Rules* (Edward Elgar Publishing 2011)

- Ogus A, *Regulation: Legal Form and Economic Theory* (Bloomsbury Publishing 2004)
- Olson M, *The Logic of Collective Action: Public Goods and the Theory of Groups* (Harvard University Press 1971)
- Organisation for Economic Co-operation Development (OECD), *Regulatory Co-operation for an Interdependent World* (OECD 1994)
- Organization for Economic Co-operation and Development (OECD), *Regulating Policies in OECD Countries* (Paris, 2002)
- Park JH, *Patents and Industry Standards* (Edward Elgar Publishing 2010)
- Pentheroudakis C, Baron J and Thumm N, *Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases* (Publications Office of the European Union 2017)
- Pratt JW and Zeckhauser R, *Principals and Agents: The Structure of Business* (Harvard Business School Press 1985)
- Purnhagen K, *The Politics of Systematization in EU Product Safety Regulation: Market, State, Collectivity, and Integration* (Springer Netherlands 2013)
- Sauter W, *Coherence in EU Competition Law* (Oxford University Press 2016)
- Scharpf F, *Governing in Europe: Effective and Democratic?* (Oxford University Press 1999)
- Schepel H, *The Constitution of Private Governance: Product Standards in the Regulation of Integrating Markets* (Hart Publishing, 2005)
- Schepel H, *Legal Aspects of Standardisation in the Member States of the EC and EFTA: Volume 1: Comparative Report* (Luxembourg : Office for Official Publications of the European Communities 2000)
- Schoechele TD, *Standardization and Digital Enclosure: The Privatization of Standards, Knowledge, and Policy in the Age of Global Information Technology* (Information Science Reference 2009)
- Schütze R, *From International to Federal Market: The Changing Structure of European Law* (First edn, Oxford University Press 2017)
- Seidman H and Gilmour R, *Politics, Position and Power : From the Positive to the Regulatory State* (New York: Oxford University Press 1986)
- Seo D, *Evolution and Standardization of Mobile Communications Technology* (Information Science Reference 2013)
- Smith GJ, *Internet Law and Regulation* (Sweet & Maxwell 2007)
- Spiller PT and others, *Regulation, Institutions and Commitment : The British Telecommunications Sector* (World Bank 1994)
- Stehmann O, *Network Competition for European Telecommunications* (Oxford University Press 1995)
- Stremitzer A, *Agency Theory: Methodology, Analysis* (Peter Lang AG 2005)

- Sunstein CR, *After The Rights Revolution: Reconceiving The Regulatory State* (Harvard University Press 1993)
- Tapia C, *Industrial Property Rights, Technical Standards and Licensing Practices (FRAND) in the Telecommunications Industry* (Köln: Carl Heymanns, 2010)
- Thatcher M and Stone Sweet A, *The Politics of Delegation* (Frank Cass 2003)
- Thatcher M, *The Europeanisation of Regulation: The Case of Telecommunications* (European University Institute 1999)
- Thatcher M, *The Politics of Telecommunications : National Institutions, Convergence, and Change In Britain And France* (Oxford University Press 1999)
- Tinbergen J, *International economic integration* (Amsterdam : Elsevier 1954)
- Torti V, *Intellectual Property Rights and Competition in Standard Setting: Objectives and Tensions* (Routledge 2016)
- Townley C, *Article 81 EC and Public Policy* (Bloomsbury Publishing 2009)
- Tsilikas H, *Antitrust Enforcement and Standard Essential Patents* (1 edn, Nomos Verlagsgesellschaft mbH 2017)
- Veljanovski CG, *Economic Principles of Law* (Cambridge University Press 2007)
- Vinje T, *The Intellectual Property and Antitrust Review* (Law Business Research 2016)
- Viscusi WK, Vernon JM and Harrington JE, *Economics of Regulation and Antitrust* (3rd edn, MIT Press 2000)
- Whish R and Bailey D, *Competition Law* (Ninth edn, Oxford University Press 2018)
- Williamson OE, *Markets and Hierarchies: Analysis and Antitrust Implications: A Study in the Economics of Internal Organization* (Free Press 1975)
- Williamson OE, *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting* (Free Press 1985)
- Wilson JQ, *The Politics of Regulation* (Basic Books 1980)
- Zúñiga Schroder H, *Harmonization, Equivalence and Mutual Recognition of Standards in WTO Law* (Wolters Kluwer Law & Business Distributed in North, Central and South America by Aspen Publishers, Inc 2011)

Chapters in Books

- Arrow KJ, 'Agency and the Market' in *Handbook of Mathematical Economics* (Vol 3, Elsevier 1986)
- Arrow KJ, 'The Potentials and Limits of the Market in Resource Allocation', in G.R. Feiwel (ed.), *Issues in Contemporary Microeconomics and Welfare* (The Macmillan Press 1985)

Arrow, KJ, 'The Organization of Economic Activity: Issues Pertinent to the Choice of Market Versus Nonmarket Allocation' in Haveman RH, *Public Expenditure and Policy Analysis* (Markham 1971)

Balleisen EJ and Eisner M, 'The Promise and Pitfalls of Co-Regulation: How Governments Can Draw on Private Governance for Public Purpose' in Moss DA and Cisternino J (eds), *New Perspectives on Regulation* (The Tobin Project 2009)

Baldwin R, 'Better Regulation: The Search and the Struggle' in Martin C and others (eds), *The Oxford Handbook of Regulation* (Oxford University Press 2010)

Barnard C, 'Derogations, Justifications and the Four Freedoms: Is State Interest really Protected?' in Barnard C and Odudu O (eds), *The outer limits of European Union law* (Hart 2009)

Barney JB and Hesterly W, 'Organizational Economics: Understanding the Relationship between Organizations and Economic Analysis' in Glegg SR and others (eds), *Handbook of Organization Studies* (2 edn, SAGE Publications Ltd 2006)

Baumol WJ, 'Welfare Economics and the Theory of the State' in Rowley CK and Schneider F (eds), *The Encyclopedia of Public Choice* (Springer US 2004)

Bekkers R, 'Where Patents and Standards Come Together' in Hawkins R, Blind K and Page Ra (eds), *Handbook of Innovation and Standards* (Edward Elgar Publishing 2017)

Bieber R and Amarelle C, 'Simplification of European Law' in Snyder FG (ed) *The Europeanisation Of Law : The Legal Effects of European Integration* (Hart 2000)

Blind K, 'The Impact of Regulation on Innovation' in Edler J and others (eds), *Handbook of Innovation Policy Impact* (Handbook of Innovation Policy Impact, Edward Elgar 2016)

Bosworth DS, Mangum Iii RW and Matolo EC, 'FRAND Commitments and Royalties for Standard Essential Patents' in Bharadwaj A and others (eds), *Complications and Quandaries in the ICT Sector: Standard Essential Patents and Competition Issues* (Springer Singapore 2018)

Brandsma GJ and Adriaensen J, 'The Principal-Agent Model, Accountability and Democratic Legitimacy' in Delreux T and Adriaensen J (eds), *The Principal Agent Model and the European Union* (Springer International Publishing 2017)

Brooks R and Geradin D, 'Taking Contracts Seriously: The Meaning of the Voluntary Commitment to Licence Essential Patents on "Fair and Reasonable" Terms' in Anderman SD and Ezrachi A (eds), *Intellectual Property and Competition Law: New Frontiers* 389 (Oxford Univ. Press 2011)

Bruzzo G and Capozzi S, 'Collaborative Standardisation and SEP Licensing: A EU Policy Perspective', in Tavassi M and Muscolo G (eds), *The Interplay Between Competition Law and Intellectual Property : An International Perspective* (Alphen aan den Rijn, The Netherlands, Wolters Kluwer, 2019)

Carpenter D and Moss DA, 'Introduction' in Carpenter D and Moss DA (eds), *Preventing Regulatory Capture: Special Interest Influence and How to Limit it* (Cambridge University Press 2013)

- Carpenter D, 'Corrosive Capture? The Duelling Forces of Autonomy and Industry Influence in FDA Pharmaceutical Regulation' in Carpenter D and Moss DA (eds), *Preventing Regulatory Capture: Special Interest Influence and How to Limit it* (Cambridge University Press 2013)
- Carpenter D, 'Detecting and Measuring Capture' in Carpenter D and Moss DA (eds), *Preventing Regulatory Capture: Special Interest Influence and How to Limit it* (Cambridge University Press 2013)
- Coase RH, 'The Theory of the Firm' (1937) 4 *Economica* NS 386–405, reprinted in R. H. Coase, *The Firm, The Market, and The Law* (University of Chicago Press, 1988)
- Contreras JL, 'Essentiality and Standards-Essential Patents' in Contreras JL (ed) *The Cambridge Handbook of Technical Standardization Law: Competition, Anti-trust, and Patents* (Cambridge University Press 2017)
- Curtin D, 'Delegation to EU Non-Majoritarian Agencies and Emerging Practices of Public Accountability' in Geradin D, Muñoz R and Petit N (eds), *Regulation through Agencies: A New Paradigm of European Governance* (Edward Elgar 2005)
- Delimatsis P, 'Relevant international standards' and 'recognised standardisation bodies' under the TBT Agreement' in Delimatsis P (ed) *The Law, Economics and Politics of International Standardisation* (Cambridge University Press 2015)
- De Vries HJ, 'Introduction to Standards and Standardization' in de Vries HJ (ed) *Standardization: A Business Approach to the Role of National Standardization Organizations* (Springer US 1999) 15
- De Witte B, 'Non-Market Values in Internal Market Legislation', in Niamh Nic Shuibhne (ed.), *Regulating the Internal Market* (Cheltenham: Edward Elgar, 2006)
- Eckert S, 'European Regulatory Governance' in Levi-Faur D (ed) *Handbook on the Politics of Regulation* (Edward Elgar 2011)
- Egan M, 'Mutual Recognition and Standard Setting: Public and Private Strategies for Governing Markets', in Pollack MA and Shaffer GC (eds), *Transatlantic Governance in the Global Economy* (Rowman & Littlefield 2001)
- Ellis W, 'Intellectual Property Rights and High Technology Standards in Standards Policy for Information Infrastructure' in Kahin B and Abbate J eds, *Standards Policy for Information Infrastructure* (MIT Press 1995)
- Failli R, Schmitt G, Foxman A, Blikrud P, Toepfer A, Gießler M and Lilly N, 'The Contribution of the GSM Association to the Building of GSM and UMTS' in Hillebrand F (ed) *GSM and UMTS: The Creation of Global Mobile Communication* (John Wiley & Sons 2001)
- Frieden R, 'Whither Convergence: Legal, Regulatory and Trade Opportunism in Telecommunications' in Geradin D, and Luff D eds, *The WTO and Global Convergence in Telecommunications and Audio-Visual Services* (Cambridge University Press 2004)

- Ganslandt M, 'Intellectual Property Rights and Competition Policy' in Keith EM (ed) *Intellectual Property, Growth and Trade*, vol 2 (Emerald Group Publishing Limited 2007)
- Garben S and Govaere I, 'The Multi-faceted Nature of Better Regulation' in Garben S and Govaere I (eds), *The EU Better Regulation Agenda : A Critical Assessment* (Hart Publishing 2018)
- Geradin D and McCahery JA, 'Regulatory Co-Opetition: Transcending The Regulatory Competition Debate' in Jordana J and Levi-Faur D, *The Politics of Regulation : Examining Regulatory Institutions and Instruments in the Age of Governance* (Edward Elgar 2004)
- Geradin D, 'Does the Guidance Paper on Article 102 Matter?' in Etro F and Kokkoris I (eds), *Competition Law and the Enforcement of Article 102* (Oxford University Press 2010)
- Geradin D, 'European Union Competition Law, Intellectual Property Law and Standardization' in Contreras JL (ed), *The Cambridge Handbook of Technical Standardization Law: Competition, Antitrust, and Patents* (Cambridge University Press 2017)
- Ghidini G and Trabucco G, 'Calculating FRAND Licensing Fees: A Proposal of Basic Pro-competitive Criteria' in Bharadwaj A and others (eds), *Complications and Quandaries in the ICT Sector: Standard Essential Patents and Competition Issues* (Springer Singapore 2018)
- Graham C, 'Self-Regulation', in G. Richardson and H. Genn (eds), *Administrative Law and Government Action* (Oxford, 1994)
- Grasso R, 'Selected Issues in SEP Licensing in Europe: The Antitrust Perspective' in Bharadwaj A and others (eds), *Complications and Quandaries in the ICT Sector: Standard Essential Patents and Competition Issues* (Springer Singapore 2018)
- Goodin R and Braithwaite J, 'The Regulatory State?' in Goodin R (ed) *The Oxford Handbook of Political Science* (The Oxford Handbook of Political Science, Oxford University Press 2011)
- Gupta K, 'How SSOs Work: Unpacking the Mobile Industry's 3GPP Standards' in Contreras JL (ed) *The Cambridge Handbook of Technical Standardization Law: Competition, Antitrust, and Patents* (Cambridge University Press 2017)
- Hart O and Holmström B, 'The Theory of Contracts' in Bewley TF (ed) *Advances in Economic Theory: Fifth World Congress* (Cambridge University Press 1987)
- Haug T, Dupuis P, and Temple S, 'The Agreement on the Concepts and the Basic Parameters of the GSM Standard (mid-1982 to mid-1987)' in Hillebrand F (ed) *GSM and UMTS: The Creation of Global Mobile Communication* (John Wiley & Sons 2001)
- Heath C, 'Patents and Standards' in Hwang T-L and Chen C, *The Future Development of Competition Framework* (Kluwer Law International 2004)
- Hertog Jd, 'General Theories of Regulation' in Bouckaert B and Geest Gd (eds), *Encyclopedia of Law and Economics*, vol 1 (E. Elgar Pub 2000)

Iversen EJ, 'Standardization and Intellectual Property Rights: Conflicts Between Innovation and Diffusion in New Telecommunications Systems' in Kai J (ed) *Information Technology Standards and Standardization: A Global Perspective* (IGI Global 2000);

Kay J, 'The Forms of Regulation' in Seldon A (ed), *Financial Regulation - or over-Regulation?* (Institute of Economic Affairs 1988)

Klein B, 'Transaction Cost Determinants of 'Unfair' Contractual Arrangements' in Victor P Goldberg (ed), *Readings in the Economics of Contract Law* (Cambridge University Press 1982)

Knill C and Lenschow A, 'Modes of Regulation in the Governance of the European Union: Towards a Comprehensive Evaluation' in Jordana J and Levi-Faur D (eds), *The Politics of Regulation: Institutions and Regulatory Reforms for the Age of Governance* (Edward Elgar 2004)

Koenig-Archibugi M, 'Global Regulation' in Martin C and others (eds), *The Oxford Handbook of Regulation* (Oxford University Press 2010)

Kokkoris I, 'Is there a Gap in the Enforcement of Article 102?' in Etro F and Kokkoris I (eds), *Competition Law and the Enforcement of Article 102* (Oxford University Press 2010)

Larouche P and Zingales N, 'Injunctive Relief in the EU – Intellectual Property and Competition Law at the Remedies Stage' in Contreras JL (ed) *The Cambridge Handbook of Technical Standardization Law: Competition, Antitrust, and Patents* (Cambridge University Press 2017)

Letter from Michael A. Lindsay to the Honorable William J. Baer, Assistant Attorney General, U.S. Department of Justice, 7 November 2014, 1, 2 found in Taffet R and Harris P, 'Standards and Intellectual Property Rights Policies' in Drapkin ML, *Patents And Standards : Practice, Policy, and Enforcement* (BNA Books 2018)

Lupia A, 'Delegation of Power: Agency Theory' in Smelser NJ and Baltes B (eds), *International Encyclopedia of the Social and Behavioral Sciences* (International Encyclopedia of the Social and Behavioral Sciences, 2001)

Majone G, 'The Politics of Regulation and European Regulatory Institutions' in Hayward J and Menon A (eds), *Governing Europe* (Oxford University Press 2003)

Kleiman M and Teles S, 'Market and Non-Market Failures' in Goodin R and others (eds), *The Oxford Handbook of Public Policy* (Oxford University Press 2008)

McLean I, 'The history of regulation in the United Kingdom: Three case studies in search of a theory' in Jordana J and others (eds), *The Politics of Regulation Institutions and Regulatory Reforms for the Age of Governance* (Edward Elgar Publishing, 2004)

McMahon K, 'A Reformed Approach to Article 82 and the Special Responsibility not to Distort Competition' in Ariel Ezrachi (ed) *Article 82 EC – Reflections on its Recent Evolution* (Hart 2009)

Mesel ND, 'Interpreting the 'FRAND' in FRAND Licensing: Licensing and Competition Law Ramifications of the 2017 Unwired Planet v Huawei UK High Court

Judgements' in Bharadwaj A and others (eds), *Multi-dimensional Approaches Towards New Technology: Insights on Innovation, Patents and Competition* (Springer Singapore 2018)

Mitnick BM, 'Capturing "capture": Definition and Mechanisms' in Levi-Faur D (ed), *Handbook on the Politics of Regulation* (Edward Elgar 2011)

Motta M, 'Competition Policy: History, Objectives, and the Law' in Motta M (ed) *Competition Policy: Theory and Practice* (Cambridge University Press 2004)

Myles G, 'Public Goods' in Myles GD (ed) *Public Economics* (Cambridge University Press 1995)

Noll RG, 'Chapter 22 Economic Perspectives on the Politics of Regulation' *Handbook of Industrial Organization, vol 2* (Handbook of Industrial Organization, Elsevier 1989)

Ogus A, 'W(h)ither the Economic Theory of Regulation? What Economic Theory of Regulation?' in Jordana J and others (eds), *The Politics of Regulation Institutions and Regulatory Reforms for the Age of Governance* (Edward Elgar Publishing, 2004)

Petit N, 'EU Competition Law Analysis of FRAND Disputes' in Contreras JL (ed), *The Cambridge Handbook of Technical Standardization Law: Competition, Anti-trust, and Patents* (Cambridge University Press 2017)

Posner RA, 'The Concept of Regulatory Capture: A Short, Inglorious History,' in Carpenter D and Moss DA, *Preventing Regulatory Capture: Special Interest Influence and how to Limit it* (Cambridge University Press 2013)

Przeworski A, Stokes SC and Manin B, *Democracy, Accountability, and Representation, vol 2* (Cambridge University Press 1999)

Radaelli Cand De Francesco F, 'Regulatory Impact Assessment' in R. Baldwin, M. Cave, and M. Lodge (eds), *The Oxford Handbook of Regulation* (Oxford, 2010)

Sandholtz W, 'The Emergence of a Supranational Telecommunications Regime', in Sandholtz W and Stone Sweet A (eds), *European Integration and Supranational Governance* (Oxford University Press 1998)

Scharpf F, 'Negative and Positive Integration in the Political Economy of European Welfare States' in Rhodes M and Mény Y (eds), *The Future of European Welfare: A New Social Contract?* (Palgrave Macmillan UK 1998)

Schepel H, 'Between Standards and Regulation: On the Concept of 'de facto Mandatory Standards' after Tuna II and Fra.bo' in Delimatsis P (ed) *The Law, Economics and Politics of International Standardisation* (Cambridge University Press 2015)

Schöler K, 'Patents and Standards: The Antitrust Objection as a Defense in Patent Infringement Proceedings' in Prinz zu Waldeck und Pyrmont and others (eds), *Patents and Technological Progress in a Globalized World: Liber Amicorum Joseph Straus* (Springer Berlin Heidelberg 2009)

Scott C, 'Integrating Regulatory Governance and Better Regulation as Reflexive Governance' in Garben S and Govaere I (eds), *The EU Better Regulation Agenda : A Critical Assessment* (Hart Publishing 2018)

- Shapiro C, 'Setting Compatibility Standards: Cooperation or Collusion' in Dreyfuss RC et al (eds), *Expanding the Bounds of Intellectual Property: Innovation Policy for the Knowledge Society* (Oxford University Press, 2001)
- Shefali VP, Vieider F and Tetlock PE, 'Process Versus Outcome Accountability' in Bovens M and others (eds), *The Oxford Handbook of Public Accountability* (Oxford University Press 2014)
- Stasik EL, 'The Role of the European Commission in the Development of the ETSI IPR Policy and the Nature of FRAND in Standardization' in Bharadwaj A and others (eds), *Multi-dimensional Approaches Towards New Technology: Insights on Innovation, Patents and Competition* (Springer Singapore 2018)
- Stone Sweet A, 'European Integration and the Legal System' in Börzel TA and Cichowski RA (eds), *The State of the European Union : Law, Politics, and Society* (Oxford University Press USA - OSO 2003)
- Swann D, 'The Regulatory Scene: An Overview' in Button K and Swann D (eds), *The Age of Regulatory Reform* (Macmillan, Londres 1989)
- Taffet R and Harris P, 'Standards and Intellectual Property Rights Policies' in Drapkin ML, *Patents And Standards : Practice, Policy, and Enforcement* (BNA Books 2018)
- Töller A, 'Voluntary Approaches to Regulation – Patterns, Causes and Effects' in Levi-Faur D (eds), *Voluntary Approaches to Regulation – Patterns, Causes and Effects* (Cheltenham, UK: Edward Elgar Publishing, 2011)
- Tsilikas H, 'Enforcement of FRAND Commitments and Competition Law Litigation of Standard-Essential Patents in Germany Post-Huawei' in Tavassi M and Muscolo G (eds), *The Interplay Between Competition Law and Intellectual Property: An International Perspective* (Alphen aan den Rijn, The Netherlands, Wolters Kluwer, 2019)
- Udo D, Wulf R and Wolfgang W, 'The Dynamics of Change in EU Governance' in Udo D and others (eds), *The Dynamics of Change in EU Governance* (Edward Elgar 2011)
- Van Ooik R, 'The Growing Importance of Agencies in the EU: Shifting Governance and the Institutional Balance', in Curtin D M and Wessel R A (eds), *Good Governance and the European Union: Reflections on Concepts, Institutions and Substance* (Antwerp: Intersentia 2005)
- Veljanovski C, 'Strategic Use of Regulation' in Robert B and others (eds), *The Oxford Handbook of Regulation* (Oxford University Press 2010)
- Veljanovski C, 'Economic Approaches to Regulation' in Baldwin R, Cave M and Lodge M, *The Oxford Handbook of Regulation* (Oxford University Press 2010)
- Verbruggen P, 'Tort Liability for Standards Development in the United States and European Union' in Contreras JL (ed), *The Cambridge Handbook of Technical Standardization Law: Further Intersections of Public and Private Law, vol 2* (Cambridge University Press 2019)

Vos E, 'Independence, Accountability and Transparency of European Regulatory Agencies' in Geradin D and others (eds), *Regulation through Agencies in the EU : A New Paradigm of European Governance* (Edward Elgar 2005)

Waelbroeck D, 'The Assessment of Efficiencies under Article 102 and the Commission's Guidance Paper' in Etro F and Kokkoris I (eds), *Competition Law and the Enforcement of Article 102* (Oxford University Press 2010)

Walden I, 'European Union Communications Law' in Walden I (ed), *Telecommunications Law and Regulation* (Fifth edn, Oxford University Press 2018)

Weatherill S, 'Supply and Demand for Internal Market Regulation : Strategies, Preferences and Interpretation', in Niamh Nic Shuibhne (ed.), *Regulating the Internal Market* (Cheltenham: Edward Elgar, 2006)

Weiler J, 'From Dassonville to Keck and beyond: an evolutionary reflection on the text and context of the free movement of goods' in Craig PP and De Burca G (eds), *The evolution of EU law* (1st edn, Oxford University Press 2009)

Journal Articles

Abbott KW and Snidal D, 'International 'Standards' and International Governance' (2001) 8 *Journal of European Public Policy* 345

Abrenica JV, 'Balancing Consumer Welfare and Public Interest in Competition Law Special Issue on Revisiting Exceptions under International Economic Law' (2018) *Asian Journal of WTO and International Health Law and Policy* 443

Alter KJ and Meunier-Aitsahalia S, 'Judicial Politics in the European Community: European Integration and the Pathbreaking Cassis de Dijon Decision' (1994) 26 *Comparative Political Studies* 535

Andersson S and Bergman T, 'Controlling Corruption in the Public Sector' (2009) 32 *Scandinavian Political Studies* 45

Angwenyi V, 'Hold-up, Hold-out and F/RAND: The Quest for Balance' (2017) 12 *Journal of Intellectual Property Law & Practice* 1012

Aranson PH, 'Theories of Economic Regulation: From Clarity to Confusion' (1989) 6 *The Journal of Law & Politics* 247

Arrow K, 'The Economics of Agency' (1985) John IV Pratt und Richard J Zeckhauser, *Principals and Agents The Structure of Business*, Boston 37

Axelrod R and others, 'Coalition Formation in Standard-Setting Alliances' (1995) 41 *Management Science* 1493

Baggott R and Harrison L, 'The Politics of Self-Regulation' (1986) 14 *Policy and Politics* 143

Baggott R, 'Regulatory Reform in Britain: The Changing Face of Self-Regulation' (1989) 67 *Public Administration* 435

Bagley N, 'Agency Hygiene' (2010) 89 *Texas Law Review* 1

Baldwin RE, McLaren J and Panagariya A, 'Regulatory Protectionism, Developing Nations, and a Two-Tier World Trade System [with Comments and Discussion]' (2000) *Brookings Trade Forum* 237

Barazza S, 'Licensing Standard Essential Patents, Part One: The Definition of F/RAND Commitments and the Determination of Royalty Rates' (2014) 9 *Journal of Intellectual Property Law & Practice* 465

Barazza S, 'Licensing Standard Essential Patents, Part Two: The Availability of Injunctive Relief' (2014) 9 *Journal of Intellectual Property Law & Practice* 552

Barkow RE, 'Insulating Agencies: Avoiding Capture through Institutional Design' (2010) 89 *Texas Law Review* 15

Baron J and Pohlmann T, 'Mapping Standards to Patents Using Declarations of Standard-Essential Patents' (2018) 27 *Journal of Economics & Management Strategy* 504

Baron J and Spulber DF, 'Technology Standards and Standard Setting Organizations: Introduction to the Searle Center Database' (2018) 27 *Journal of Economics & Management Strategy* 462

Baron J, Pohlmann T and Blind K, 'Essential Patents and Standard Dynamics' (2016) *Research Policy* 1721

Bartle IAN and Vass P, 'Self-Regulation Within the Regulatory State: Towards A New Regulatory Paradigm?' (2007) 85 *Public Administration* 885

Batista PHD and Mazutti GC, 'Comment on "Huawei Technologies" (C-170/13): Standard Essential Patents and Competition Law – How Far Does the CJEU Decision Go?' (2016) 47 *IIC - International Review of Intellectual Property and Competition Law* 244

Bator FM, 'The Anatomy of Market Failure' (1958) 72 *The Quarterly Journal of Economics* 351

Becker G, 'Toward a More General Theory of Regulation' (1976) 19 *The Journal of Law & Economics* 245

Becker GS, 'A Theory of Competition Among Pressure Groups for Political Influence' (1983) 98 *The Quarterly Journal of Economics* 371

Bekkers R and Liotard I, 'European Standards for Mobile Communications: The Tense Relationship Between Standards and Intellectual Property Rights' (1999) 3 *European Intellectual Property Review* 110

Bekkers R and West J, 'The Limits to IPR Standardization Policies as Evidenced By Strategic Patenting in UMTS' (2009) 33 *Telecommunications Policy* 80

Bekkers R, 'Knowledge Positions in High-Tech Markets: Trajectories, Standards, Strategies and True Innovators' 79 *Technological Forecasting & Social Change* 1192

Bekkers R, Bongard R and Nuvolari A, 'An Empirical Study on the Determinants of Essential Patent Claims in Compatibility Standards' (2011) 40 *Research Policy* 1001

- Bekkers R, Duysters G and Verspagen B, 'Intellectual Property Rights, Strategic Technology Agreements and Market Structure: The Case of GSM' (2002) 31 Research Policy 1141
- Bekkers R, Iversen E and Blind K, 'Emerging Ways to Address the Re-emerging Conflict between Patenting and Technological Standardization' (2012) 21 Industrial and Corporate Change 901
- Bekkers R, Verspagen B and Smits J, 'Intellectual property Rights And Standardization: The Case Of GSM' (2002) 26 Telecommunications Policy 171
- Belleflamme P, 'Coordination on Formal vs. de facto Standards: A Dynamic Approach' (2002) 18 European Journal of Political Economy 153
- Berg SV, 'Technical Standards as Public Goods: Demand Incentives for Cooperative Behavior' (1989) 17 Public Finance Quarterly 29
- Bergen M, Dutta S and Walker OC, 'Agency Relationships in Marketing: A Review of the Implications and Applications of Agency and Related Theories' (1992) 56 Journal of Marketing 1
- Berger F, Blind K and Thumm N, 'Filing Behaviour Regarding Essential Patents in Industry Standards' (2012) 41 Research Policy 216
- Bergman T, 'Introduction: Delegation and Accountability in European Integration' (2000) 6 The Journal of Legislative Studies 1
- Bergman T, 'The European Union as the next step of delegation and accountability' (2000) 37 European Journal of Political Research 415
- Bergman T, Müller WC and Strøm K, 'Introduction: Parliamentary democracy and the chain of delegation' (2000) 37 European Journal of Political Research 255
- Bernstein MH, 'Independent Regulatory Agencies: A Perspective On Their Reform' 400 The Annals of the American Academy of Political and Social Science 14
- Berry WD, 'An Alternative to the Capture Theory of Regulation: The Case of State Public Utility Commissions' (1984) 28 American Journal of Political Science 524
- Besen SM and Farrell J, 'Choosing How to Compete: Strategies and Tactics in Standardization' (1994) 8 Journal of Economic Perspectives 117
- Besen SM, 'The European Telecommunications Standards Institute - a Preliminary - Analysis' (1990) 14 Telecommunications Policy 521
- Bharadwaj A and Singh M, 'A Single Spark Can Start a Prairie Fire: Implication of the 2015 Amendments to IEEE-SA's Patent Policy' (2018) Capital University Law Review 583
- Binenbaum E, 'Incentive Issues In R&D Consortia: Insights From Applied Game Theory' (2008) 26 Contemporary Economic Policy 636
- Black J, 'Constitutionalising Self-Regulation' (1996) 59 The Modern Law Review 24
- Black J, 'Decentring Regulation: Understanding the Role of Regulation and Self-Regulation in a 'Post-Regulatory' World' (2001) 54 Current Legal Problems 103

Blind K and Pohlmann T, 'Trends in the Interplay of IPR and Standards, FRAND Commitments and SEP Litigation' (2013) 37 *Praxis der Informationsverarbeitung und Kommunikation* 189

Blind K and Thumm N, 'Interrelation Between Patenting and Standardisation Strategies: Empirical Evidence and Policy Implications' (2004) 33 *Research Policy* 1583

Blind K, 'The Influence of Regulations on Innovation: A Quantitative Assessment for OECD Countries' (2012) 41 *Research Policy* 391

Blind K, Petersen SS and Riillo CAF, 'The Impact of Standards and Regulation on Innovation in Uncertain Markets' (2017) 46 *Research Policy* 249

Börzel T, 'European Governance: Negotiation and Competition in the Shadow of Hierarchy' (2010) 48 *JCMS: Journal of Common Market Studies* 191

Bovens M, 'Analysing and Assessing Accountability: A Conceptual Framework¹' (2007) 13 *European Law Journal* 447

Bovens M, 'New Forms of Accountability and EU-Governance' (2007) 5 *Comparative European Politics* 104

Brankin S-P, Cisnal de Ugarte S and Kimmel L, 'Huawei: Injunctions and Standard Essential Patents-Is Exclusion a Foregone Conclusion' (2015) 30 *Antitrust* 80

Brankin S-P, de Ugarte SC and Kimmel L, 'Huawei/ZTE: Towards a More Demanding Standard of Abuse in Essential Patent Cases' (2016) 7 *Journal of European Competition Law & Practice* 520

Brooks RG and Geradin D, 'Interpreting and Enforcing the Voluntary FRAND Commitment' 9 *Int J IT Stand Res* 1

Calligaris S, Criscuolo C and Marcolin L, 'Mark-ups in the Digital Era' (2018) 10 *OECD Science, Technology and Industry Working Papers* 1

Calvert RL, McCubbins MD and Weingast BR, 'A Theory of Political Control and Agency Discretion' (1989) 33 *American Journal of Political Science* 588

Camesasca P and others, 'Injunctions for Standard-Essential Patents: Justice Is Not Blind' (2013) 9 *Journal of Competition Law and Economics* 285

Carrier MA, 'A Roadmap to the Smartphone Patent Wars And FRAND Licensing' (2012) 2 *CPI Antitrust Chronicle* 1

Carrubba C and Murrah L, 'Legal Integration and Use of the Preliminary Ruling Process in the European Union' (2005) 59 *International Organization* 399

Casadesus-Masanell R and Spulber DF, 'The Fable of Fisher Body' (2000) 43 *Journal of Law & Economics* 67

Caviggioli F and others, 'Patenting Strategies and Characteristics of Declared Inventions in the Long Term Evolution Standard' (2016) 46 *R&D Management* 664

Chappatte P, 'FRAND Commitments—The Case for Antitrust Intervention' (2009) 5 *European Competition Journal* 319

Che Y-K and Sákovics J, 'A Dynamic Theory of Holdup' (2004) 72 *Econometrica* 1063

Chia TH, 'Fighting the Smartphone Patent War with RAND-Encumbered Patents' (2012) 27 *Berkeley Tech LJ* 209

Clarkson G and DeKorte D, 'The Problem of Patent Thickets in Convergent Technologies' (2006) 1093 *Annals of the New York Academy of Sciences* 180

Coase RH, 'The New Institutional Economics' (1984) 140 *Zeitschrift für die gesamte Staatswissenschaft / Journal of Institutional and Theoretical Economics* 229

Coase RH, 'The Nature of the Firm' (1937) 4 *Economica*

Coase RH, 'The Problem of Social Cost' (1960) 3 *Journal of Law and Economics* 1

Cockburn IM, MacGarvie MJ and Müller E, 'Patent Thickets, Licensing and Innovative Performance' (2010) 19 *Industrial and Corporate Change* 899

Coen D and Thatcher M, 'The New Governance of Markets and Non-Majoritarian Regulators' (2005) 18 *Governance* 329

Colangelo PG and others, 'Filling Huawei's Gaps: The Recent German Case Law on Standard Essential Patents' (2017) 38 *European Competition Law Review* 538

Colquitt JA, 'Rethinking Judicial Nominating Commissions: Independence, Accountability, and Public Support' (2007) 34 *Fordham Urban Law Journal* 73

Contreras JL, 'A Brief History of FRAND: Analyzing Current Debates in Standard Setting and Antitrust through a Historical Lens' (2015) 80 *Antitrust Law Journal* 39

Cotter TF, 'Patent Holdup, Patent Remedies, and Antitrust Responses' (2009) 34 *The Journal of Corporate Law* 1151

Cotter TF, 'Comparative Law and Economics of Standard-Essential Patents and FRAND Royalties' (2013) 22 *Texas intellectual property law journal* 311

Cox JWR, 'The Appeal to the Public Interest' (1973) 3 *British Journal of Political Science* 229

Dahlman CJ, 'The Problem of Externality' (1979) 22 *The Journal of Law & Economics* 141

Dal Bó E, 'Regulatory Capture: A Review' (2006) 22 *Oxford Review of Economic Policy* 203

Daskalova VI, 'Consumer Welfare in EU Competition Law: What is it (not) about?' (2015) 11 *Competition law review* 133

David PA and Shurmer M, 'Formal Standards-Setting for Global Telecommunications and Information Services: Towards an Institutional Regime Transformation?' (1996) 20 *Telecommunications Policy* 789

De Cockborne JE, 'Towards an Open European Telecommunications Market in 1998: Recent Developments of EU Telecommunications Policy' (1994) 8 *International Review of Law, Computers & Technology* 269

- De Schutter O, Lebessis N and Paterson J, 'Governance in the European Union' (2011) Cahiers of the Forward Studies Unit1
- Dehousse R, 'Delegation of Powers in the European Union: the Need for a Multi-Principals Model' (2008) 31 West European Politics 789
- Dehousse R, '1992 and Beyond: The Institutional Dimension of the Internal Market Programme' (1989) 16 Legal Issues of Economic Integration 109
- Dehousse R, 'Integration v. Regulation? On the Dynamics of Regulation in the European Community' (1992) 30 JCMS: Journal of Common Market Studies 383
- DeLong JV, 'New Wine for a New Bottle: Judicial Review in the Regulatory State' (1986) 72 Virginia Law Review 399
- Denicolò V and others, 'Revisiting Injunctive Relief: Interpreting eBay in High-Tech Industries with non-Practicing Patent Holders' (2008) 4 Journal of Competition Law & Economics 571
- Diez MF, Leigh MD and Tambunlertchai S, 'Global market power and its macroeconomic implications' (2018) 137 IMF Working Papers
- Dixon AN, 'ETSI Complaint and the European Commission's Communication on Standardization, The' (1996) 1 International Intellectual Property Law & Policy 369
- Dolmans M, 'Standards for Standards' (2002) 26 Fordham Int'l LJ 163
- Doyle C, 'Effective Sectoral Regulation: Telecommunications in the EU' (1996) 3 Journal of European Public Policy 612
- Drahos P, 'The Regulation of Public Goods' (2004) 7 Journal of International Economic Law 321
- Dubnick MJ and Frederickson HG, 'Accountable Agents: Federal Performance Measurement and Third-Party Government' (2010) 20 Journal of Public Administration Research and Theory i143
- Dunnewijk T and Hultén S, 'A Brief History of Mobile Communication in Europe' (2007) 24 Telematics and Informatics 164
- Egan M, 'Regulatory Strategies, Delegation and European Market Integration' (1998) 5 Journal of European Public Policy 485
- Egan M, 'Setting Standards: Strategic Advantages in International Trade' (2002) 13 Business Strategy Review 51
- Eisenhardt KM, 'Agency Theory: An Assessment and Review' (1989) 14 The Academy of Management Review 57
- Elhauge E, 'Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?' (2008) 4 Journal of Competition law & Economics 535
- Ellingsen T and Johannesson M, 'Is There a Hold-Up Problem?' (2004) 106 The Scandinavian Journal of Economics 475
- Epstein RA and Kappos DJ, 'Legal remedies for patent infringement: from general principles to FRAND obligations for standard essential patents' (2013) 9 Competition Policy International 69

- Epstein RA and Kuhlik B, 'Is There a Biomedical Anticommons' (2004) 27 Regulation 55
- Epstein RA, Kieff FS and Spulber DF, 'The FTC, IP, and SSOs: Government Hold-Up Replacing Private Coordination' (2012) 8 Journal of Competition Law and Economics 1
- Everson M, 'Independent Agencies: Hierarchy Beaters?' (1995) 1 European Law Journal 180
- Falke J and Joerges C, 'Traditional Law Approximation Policy Approaches to Removing Technical Barriers to Trade and Efforts at a Horizontal European Product Safety Policy' (2010) 6(2) Hanse Law Review 237
- Farber D and Baran P, 'The Convergence of Computing and Telecommunications Systems' (1977) 195 Science 1166
- Farrell J, 'Information and the Coase Theorem' (1987) 1 The Journal of Economic Perspectives 113
- Farrell J and Saloner G, 'Coordination Through Committees and Markets' (1988) 19 The RAND Journal of Economics 235
- Farrell J et al, 'Standard Setting, Patents, and Hold-Up: A Troublesome Mix' (2007) 74 Antitrust Law Journal 603
- Fenn P and Veljanovski CG, 'A Positive Economic Theory of Regulatory Enforcement' (1988) 98 The Economic Journal 1055
- Fisher E, 'The European Union in the Age of Accountability' (2004) 24 Oxford Journal of Legal Studies 495, 497
- Foray D, 'Users, Standards and the Economics of Coalitions and Committees' (1994) 6 Information Economics and Policy 269
- Freeman J, 'Private Parties, Public Functions and the New Administrative Law' (2000) 52 Administrative Law Review 813
- Fuchs G, 'Policy-making in a system of multi-level governance - the Commission of the European Community and the restructuring of the telecommunications sector' (1994) 1 Journal of European Public Policy 177
- Galetovic A and Haber S, 'The Fallacies of Patent Holdup Theory' (2017) 13 Journal of Competition Law & Economics 1
- Galetovic A, Haber S and Levine R, 'An Empirical Examination of Patent Holdup' (2015) 11 Journal of Competition Law & Economics 549
- Galetovic A, Haber S and Zaretski L, 'Is There an Anticommons Tragedy in the World Smartphone Industry?' (2017) 32 Berkeley Technology Law Journal 1527
- Gandal N, Salant D and Waverman L, 'Standards in Wireless Telephone Networks' (2003) 27 Telecommunications Policy 325
- Garrett G, 'International Cooperation and Institutional Choice: The European Community's Internal Market' (1992) 46 International Organization 533

Garud R, Jain S and Kumaraswamy A, 'Institutional Entrepreneurship in the Sponsorship of Common Technological Standards: The Case of Sun Microsystems and Java' (2002) 45 *The Academy of Management Journal* 196

Geradin D and Rato M, 'Can Standard-Setting Lead to Exploitative Abuse? A Dissonant View on Patent Hold-Up, Royalty Stacking and The Meaning Of FRAND' (2007) 3 *European Competition Journal* 101

Geradin D, 'Huawei v ZTE Three Years Later: Where Do We Stand on FRAND?' (OxFirst Webinar, on 17 December 2018)

Geradin D, Layne-Farrar A and Padilla AJ, 'Complements Problem within Standard Setting; Assessing the Evidence on Royalty Stacking, The' (2008) 14 *Boston University Journal of Science & Technology Law*

Geradin et al, 'The Complements Problem within Standard Setting; Assessing the Evidence on Royalty Stacking' (2008) 14 *Boston University Journal of Science & Technology Law* (2008) 144

Gilbert RJ, 'Deal or No Deal? Licensing Negotiations in Standard-Setting Organizations' (2011) 77 *Antitrust Law Journal* 855

Ginsburg DH, Wong-Ervin K and Wright JD, 'The troubling use of antitrust to regulate FRAND licensing' (2015) 10 *CPI Antitrust Chronicle* 2

Glader M, 'Open Standards: Public Policy Aspects and Competition Law Requirements' (2010) 6 *European Competition Journal* 611

Gnes M, 'Do Administrative Law Principles Apply to European Standardization: Agencification or Privatization?' (2017) *Legal Issues of Economic Integration* 367

Good D, '1992 and Product Standards: A Conflict With Intellectual Property Rights?' (1991) *European Intellectual Property Review* 398

Good D, 'How far should IP rights have to give way to standardisation: the policy positions of ETSI and the EC' (1992) *European Intellectual Property Review* 295

Gormley WT, 'Alternative Models of the Regulatory Process: Public Utility Regulation in the States' (1982) 35 *Western Political Quarterly* 297

Grasso R, 'The ECJ Ruling in Huawei and the Right to Seek Injunctions Based on FRAND-Encumbered SEPs under EU Competition Law: One Step Forward' (2016) *World Competition* 213

Gunningham N and Rees J, 'Industry Self-Regulation: An Institutional Perspective' (2002) 19 *Law & Policy* 363

Gupta K and Snyder M, 'Smart Phone Litigation and Standard Essential Patents' (2014) Hoover IP² Working Paper Series 1

Hall BH and Ham RM, 'The Patent Paradox Revisited: Determinants of Patenting in the US Semiconductor Industry, 1980-94' (1999) No. 7062 *National Bureau of Economic Research Working Paper Series*, 1

Hall BH, 'Exploring the Patent Explosion' (2004) 30 *The Journal of Technology Transfer* 35

- Hamilton RW, 'Prospects for the Nongovernmental Development of Regulatory Standards' (1982) 32 *Am UL Rev* 455
- Hantke-Domas M, 'The Public Interest Theory of Regulation: Non-Existence or Misinterpretation?' (2003) 15 *European Journal of Law and Economics* 165
- Hardin G, 'The Tragedy of the Commons' (1968) 162 *Science* 1243
- Häusser JA and others, 'Effects of Process and Outcome Accountability on Idea Generation' (2017) 64 *Experimental Psychology* 262
- Heller MA and Eisenberg RS, 'Can Patents Deter Innovation? The Anticommons in Biomedical Research' (1998) 280 *Science (New York, NY)* 698
- Heller MA, 'The Tragedy of the Anticommons: Property in the Transition from Marx to Markets' (1998) 111 *Harvard Law Review* 621
- Hendry J, 'Beyond Self-Interest: Agency Theory and the Board in a Satisficing World' (2005) 16 *British Journal of Management* S55
- Henningsson K, 'Injunctions for Standard Essential Patents Under FRAND Commitment: A Balanced, Royalty-Oriented Approach' (2016) 47 *IIC - International Review of Intellectual Property and Competition Law* 438
- Héritier A and Eckert S, 'New Modes of Governance in the Shadow of Hierarchy: Self-Regulation by Industry in Europe' (2008) 28 *Journal of Public Policy* 113
- Hesterly WS, Liebeskind J and Zenger TR, 'Organizational Economics: An Impending Revolution in Organization Theory?' (1990) 15 *Academy of Management Review* 402
- Hofmann HCH, 'Mapping the European Administrative Space' (2008) 31 *West European Politics* 662
- Holmstrom B, 'Moral Hazard in Teams' (1982) 13 *The Bell Journal of Economics* 324
- Hovenkamp E, 'Tying, Exclusivity, and Standard-Essential Patents' (2017) 12 *The Columbia Science & Technology Law Review* 79
- Huntington SP, 'The Marasmus of the ICC: The Commission, the Railroads, and the Public Interest.' (1952) 61(4) *Yale L J* 467
- Iversen EJ, 'Patenting and Voluntary Standards: Tensions Between the Domains of Proprietary Assets and "Public Goods" in the Innovation of Network Technologies' (2001) 14 *Science & Technology Studies* 66
- Iversen EJ, Vedel T and Werle R, 'Standardization and the Democratic Design of Information and Communication Technology' (2004) 17 *Knowledge, Technology & Policy* 104
- Jacques Pelkmans, 'The New Approach to Technical Harmonization and Standardization' (1987) 25 *JCMS: Journal of Common Market Studies* 249
- James O, 'Regulation Inside Government: Public Interest Justifications and Regulatory Failures' (2000) 78 *Public Administration* 327

- Jensen MC and Meckling WH, 'Theory of the firm: Managerial Behavior, Agency Costs and Ownership Structure' (1976) 3 *Journal of Financial Economics* 305
- Joerges C, 'The Market without the State? The Economic Constitution of the European Community and the Rebirth of Regulatory Politics' (1997) 1 *European Integration online Papers (EIoP)* 1
- Jones A, 'Standard-Essential Patents: FRAND Commitments, Injunctions and the Smartphone Wars' (2014) 10 *European Competition Journal* 1
- Jordan J, 'Product Standards, Innovation and Regulation' (1994) 6 *Technology Analysis & Strategic Management* 341
- Kang B and Bekkers R, 'Just-in-time patents and the development of standards' (2015) 44 *Research Policy* 1948
- Kang B and Motohashi K, 'Essential Intellectual Property Rights and Inventors' Involvement in Standardization' (2015) 44 *Research Policy* 483
- Karen J Alter, Sophie Munier-Aitsahalia, 'Judicial Politics in the European Community: European Integration and the Pathbreaking Cassis de Dijon Decision', *Comparative Political Studies*, Vol 26 No. 4, 4January 1994, 535
- Kay J and Vickers J, 'Regulatory reform in Britain' (1988) 3 *Economic Policy* 285
- Kerber W and Van den Bergh R, 'Mutual Recognition Revisited: Misunderstandings, Inconsistencies, and a Suggested Reinterpretation' (2008) 61 *Kyklos* 447
- Kieff FS and Layne-Farrar A, 'Incentive Effects From Different Approaches to Holdup Mitigation Surrounding Patent Remedies and Standard-Setting Organizations' (2013) 9 *Journal of Competition Law & Economics* 1091
- Kindleberger CP, 'Standards as Public, Collective and Private Goods' (1983) 36 *Kyklos* 377
- Kirkpatrick C and Parker D, 'Regulatory impact assessment and regulatory governance in developing countries' (2004) 24 *Public Administration and Development* 333
- Kitch EW, 'Comment on the Tragedy of the Anticommons in Biomedical Research' (2003) 50 *Advances in genetics* 271
- Klein B, 'Why Hold-Ups Occur: The Self-Enforcing Range of Contractual Relationships' (1996) 34 *Economic Inquiry* 444
- Klein B, Crawford RG and Alchian AA, 'Vertical Integration, Appropriable Rents, and the Competitive Contracting Process' (1978) 21 *The Journal of Law & Economics* 297
- Koop C, 'Explaining the Accountability of Independent Agencies: The Importance of Political Salience' (2011) 31 *Journal of Public Policy* 209
- Koop C, 'Theorizing and Explaining Voluntary Accountability' (2014) 92 *Public Administration* 565
- Krechmer K, 'Standardization and Innovation Policies in the Information Age' (2004) 2 *International Journal of IT Standards & Standardization Research* 49

Kuhn K-U, Morton FS and Shelanski H, 'Standard setting organizations can help solve the standard essential patents licensing problem' (2013) *CPI Antitrust Chronicle* 1

Laffan B, 'The European Union Polity: A Union of Regulative, Normative and Cognitive Pillars' (2001) 8 *Journal of European Public Policy* 709

Lamoreaux NR, 'The Problem of Bigness: From Standard Oil to Google' (2019) 33 *Journal of Economic Perspectives* 94

Lan LL and Heracleous L, 'Rethinking Agency Theory: The View From Law' (2010) 35 *The Academy of Management Review* 294

Landis JM, 'The Administrative Process' (1939) 3 *Science and Society* 550

Langus G, Lipatov V and Neven D, 'Standard-Essential Patents: Who Is Really Holding Up (And When)?' (2013) 9 *Journal of Competition Law and Economics* 253

Latzer M and others, 'Regulation remixed: Institutional change through self and co-regulation in the mediamatics sector' (2003) 50 *Communications & Strategies* 127

Layne-Farrar A and Wong-Ervin K, 'Standard-Essential Patents and Market Power' (2016) *World Competition Day, George Mason Law & Economics Research Paper No. 16-47*

Layne-Farrar A and Wong-Ervin KW, '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 *Jindal Global Law Review* 127

Layne-Farrar A, 'Innovative or Indefensible?: An Empirical Assessment of Patenting within Standard Setting' (2011) 9 *International Journal of IT Standards and Standardization Research (IJITSR)* 1

Layne-Farrar A, Padilla AJ and Schmalensee R, 'Pricing Patents For Licensing In Standard-Setting Organizations: Making Sense Of Frand Commitments' (2007) 74 *Antitrust Law Journal* 671

Lazear EP and Rosen S, 'Rank-Order Tournaments as Optimum Labor Contracts' (1981) 89 *Journal of Political Economy* 841

Lee E and Lee J, 'Reconsideration of the Winner-Take-All Hypothesis: Complex Networks and Local Bias' (2006) 52 *Management Science* 1838

Leiponen AE, 'Competing Through Cooperation: The Organization of Standard Setting in Wireless Telecommunications' (2008) 54 *Management Science* 1904

Lemley M, 'Intellectual Property Rights and Standard-Setting Organizations' (2002) 90 *California Law Review* 1889

Lemley MA and Shapiro C, 'Patent Holdup and Royalty Stacking' (2007) 85 *Texas Law Review* 1991

Lemley MA and Shapiro C, 'Reply Patent Holdup and Royalty Stacking' (2007) 85 *Texas Law Review* 2163

- Lerner J and Tirole J, 'A Model of Forum Shopping' (2006) 96 *The American Economic Review* 1091
- Lerner J, Tabakovic H and Tirole J, 'Patent Disclosures and Standard-Setting' (2017) Harvard Business School working paper series 17-030 1
- Leslie CR, 'Antitrust Law as Public Interest Law Symposium: Business Law as Public Interest Law' (2012) *UC Irvine Law Review* 885
- Leucht B, 'The Policy Origins of the European Economic Constitution' (2018) 24 *European Law Journal* 191
- Levine ME and Forrence JL, 'Regulatory Capture, Public Interest, and the Public Agenda: Toward a Synthesis' (1990) 6 *Journal of Law, Economics, & Organization* 167
- Levine R, Haber S and Galetovic A, 'An Empirical Examination of Patent Holdup' (2015) 11 *Journal of Competition Law & Economics* 549
- Lim D, 'Standard Essential Patents, Trolls, and the Smartphone Wars: Triangulating the End Game' (2014) 119 *Penn St L Rev* 1
- Little DR, Subiotto Qc R and Lepetska R, 'The Application of Article 102 TFEU by the European Commission and the European Courts' (2016) 7 *Journal of European Competition Law & Practice* 288
- Lodge M, 'The Wrong Type of Regulation? Regulatory Failure and the Railways in Britain and Germany' (2002) 22 *Journal of Public Policy* 271
- Loughlin J, 'The "Transformation" of Governance: New Directions in Policy and Politics' (2004) 50 *Australian Journal of Politics & History* 8
- Love JH, 'Opportunism, Hold-Up and the (Contractual) Theory of the Firm' (2010) 166 *Journal of Institutional and Theoretical Economics (JITE) / Zeitschrift die gesamte Staatswissenschaft* 479
- Lupia A and Sin G, 'Which Public Goods are Endangered?: How Evolving Communication Technologies Affect The Logic of Collective Action' (2003) 117 *Public Choice* 315
- Majone G, 'From the Positive to the Regulatory State: Causes and Consequences of Changes in the Mode of Governance' (1997) 17 *Journal of Public Policy* 139
- Majone G, 'Nonmajoritarian Institutions and the Limits of Democratic Governance: A Political Transaction-Cost Approach' (2001) 157 *Journal of Institutional and Theoretical Economics (JITE)* 57
- Majone G, 'The Credibility Crisis of Community Regulation' (2000) 38 *JCMS: Journal of Common Market Studies* 273
- Majone G, 'The Regulatory State and its Legitimacy Problems' (1999) 22 *West European Politics* 1
- Majone G, 'The Rise of the Regulatory State in Europe' (1994) 17 *West European Politics* 77

Makkai T and Braithwaite J, 'In and Out of the Revolving Door: Making Sense of Regulatory Capture' (1992) 12 *Journal of Public Policy* 61

Mariniello M, 'Fair, Reasonable and Non-Discriminatory (FRAND) Terms: a Challenge for Competition Authorities' (2011) 7 *Journal of Competition Law and Economics* 523

Marks G and Hooghe L, 'European integration from the 1980s: State-centric v. multi-level governance' (1996) 34 *Journal of Common Market Studies* 341

Martimort D, 'The Life Cycle of Regulatory Agencies: Dynamic Capture and Transaction Costs' (1999) 66 *The Review of Economic Studies* 929

Maume P, 'Huawei ./. ZTE, or, how the CJEU closed the Orange Book' (2016) 6 *Queen Mary Journal of Intellectual Property* 207

McCubbins MD, 'The Legislative Design of Regulatory Structure' (1985) 29 *American Journal of Political Science* 721

McCubbins MD, Noll RG and Weingast BR, 'Administrative Procedures as Instruments of Political Control' (1987) 3 *Journal of Law, Economics, & Organization* 243

McGee A and Weatherill S, 'The Evolution of the Single Market: Harmonisation or Liberalisation' (1990) 53 *The Modern Law Review* 578

McMahon K, 'Interoperability: "Indispensability" and "Special Responsibility" in High Technology Markets' (2007) 9 *Tulane Journal of Technology and Intellectual Property* 123

Medzmariashvili M, 'Delegation of Rulemaking Power to European Standards Organizations: Reconsidered' (2017) *Legal Issues of Economic Integration* 353

Melamed AD and Shapiro C, 'How Antitrust Law Can Make FRAND Commitments More Effective Collection: Unlocking Antitrust Enforcement' (2017) *Yale Law Journal* 2110

Micklitz H-W, 'European Integration Through Standardization: How Judicial Review is Breaking Down the Club House of Private Standardization Bodies' (2013) *Common Market Law Review* 145

Miller J, 'Standard Setting, Patents, and Access Lock-In: RAND Licensing and the Theory of the Firm' (2007) 40 *Indiana Law Review* 351

Moe TM, 'The New Economics of Organization' (1984) 28 *American Journal of Political Science* 739

Mortelmans K, 'Article 30 of the EEC treaty and legislation relating to market circumstances: time to consider a new definition?' (1991) 28 *Common Market Law Review* 115

Mossoff A, 'The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s' (2011) 53 *Arizona Law Review* 165

Murray F and Stern S, 'Do Formal Intellectual Property Rights Hinder the Free Flow of Scientific Knowledge?' (2007) 63 *Journal of Economic Behavior & Organization* 648

Ogus A, 'Rethinking Self-Regulation' (1995) 15 *Oxford Journal of Legal Studies* 97

Padilla J, Ginsburg DH and Wong-Ervin K, 'Antitrust Analysis Involving Intellectual Property and Standards: Implications from Economics' (2019) *Harvard Journal of Law & Technology* 1

Pelkmans J, 'The GSM Standard: Explaining a Success Story' (2001) 8 *Journal of European Public Policy* 432

Peltzman S, 'The Economic Theory of Regulation after a Decade of Regulation' (1989) *Brookings Papers in Macroeconomics*

Peltzman S, 'Towards a More General Theory of Regulation' (1976) 19 *Journal of Law and Economics* 211

Peltzman S, Levine ME and Noll RG, 'The Economic Theory of Regulation after a Decade of Deregulation' (1989) 1989 *Brookings Papers on Economic Activity Microeconomics* 1

Petersen T, 'The Economics of Organization: The Principal-Agent Relationship' (1993) 36 *Acta Sociologica* 277

Petit N, 'The IEEE-SA Revised Patent Policy and its Definition of "Reasonable" Rates: A Transatlantic Antitrust Divide?' (2017) 27 *Fordham Intellectual Property, Media & Entertainment Law Journal* 211

Petit N, 'Huawei v. ZTE: Judicial Conservatism at the Patent-Antitrust Intersection' (2015) 10 *CPI Antitrust Chronicles*,

Picht PG, 'The ECJ Rules on Standard essential Patents: Thoughts and Issues Post-Huawei' (2016) 37 *ECLR* 365

Pitarkis JY and G George, 'Joint Dynamics of Legal and Economic Integration in the European Union' (2003) 16 *Eur J of L and Econ* 357

Pohlmann T, Neuhäusler P and Blind K, 'Standard essential patents to boost financial returns' (2015) 46 *R&D Management* 612

Pollack MA, 'Delegation, Agency, and Agenda Setting in the European Union', *The Engines of European Integration* (Oxford University Press 2003)

Posner RA, 'Theories of Economic Regulation' (1974) 5 *Bell Journal of Economics* 335

Potter MR, Olejarski AM and Pfister SM, 'Capture Theory and the Public Interest: Balancing Competing Values to Ensure Regulatory Effectiveness' (2014) 37 *International Journal of Public Administration* 638

Pratt JW, 'Risk Aversion in the Small and in the Large' (1964) 32 *Econometrica* 122

Rabin RL, 'Federal Regulation in Historical Perspective' (1986) 38 *Stanford Law Review* 1189

Radner R, 'Hierarchy: The Economics of Managing' (1992) 30 *Journal of Economic Literature* 1382

Ratliff JD and Rubinfeld DL, 'The Use and Threat of Injunctions in the RAND Context' (2013) *J Comp. L & Econ* 1

- Rato M and English M, 'An Assessment of Injunctions, Patents, and Standards Following the Court of Justice's Huawei/ZTE Ruling' (2015) 7 *Journal of European Competition Law & Practice* 103
- Rensberger RA, Zande Rvd and Delaney H, 'Standards setting in the European Union, standards organizations and officials in EU standards activities' (1997) 18
- Reyna A, 'The Shaping of a European Consumer Welfare Standard for the Digital Age' (2019) 10 *Journal of European Competition Law & Practice* 1
- Richter R, 'The New Institutional Economics: Its Start, its Meaning, its Prospects' (2005) 6 *European Business Organization Law Review* 161
- Risk RCB, 'Lawyers, Courts, and the Rise of the Regulatory State' 9 *Dalhousie Law Journal* 31
- Rodrigues CA, "'Digital Gangsters" Are Big Tech Giants Challenging Democracy?' (2019) 11 *Amsterdam Law Forum* 12, 34-35; Crandall RW, 'The Dubious Antitrust Argument for Breaking Up the Internet Giants' (2019) 54 *Review of Industrial Organization* 627
- Romer PM, 'Endogenous Technological Change' (1990) 98 *Journal of Political Economy* S71
- Rosenkopf and Tushman. See Rosenkopf L and Tushman ML, 'The Coevolution of Community Networks and Technology: Lessons from the Flight Simulation Industry' (1998) 7 *Industrial and Corporate Change* 311
- Ross SA, 'The Economic Theory of Agency: The Principal's Problem' (1973) 63 *The American Economic Review* 134
- Ruachhaus RW, 'Principal-Agent Problems in Humanitarian Intervention: Moral Hazards, Adverse Selection, and the Commitment Dilemma' (2009) 53 *International Studies Quarterly* 871
- Rysman M and Simcoe T, 'Patents and the Performance of Voluntary Standard-Setting Organizations' (2008) 54 *Management Science* 1920
- Saam NJ, 'Asymmetry in Information Versus Asymmetry in Power: Implicit Assumptions of Agency Theory?' (2007) 36 *The Journal of Socio-Economics* 825
- Sampath PG and Park W, 'Do Patents Lead to Market Concentration and Excess Profits?' (2019) *Global Development and Environment Institute Working Paper No. 19-02* 1
- Samuelson PA, 'Diagrammatic Exposition of a Theory of Public Expenditure' (1955) 37 *The Review of Economics and Statistics* 350
- Samuelson PA, 'The Pure Theory of Public Expenditure' (1954) 36 *The Review of Economics and Statistics* 387
- Sandholtz W, 'Institutions and Collective Action: The New Telecommunications in Western Europe' (1993) 45 *World Politics* 242
- Sandler T and Tschirhart JT, 'The Economic Theory of Clubs: An Evaluative Survey' (1980) 18 *Journal of Economic Literature* 1481

Saurwein F, 'Regulatory Choice for Alternative Modes of Regulation: How Context Matters' (2011) 33 *Law & Policy* 334

Schellingerhout R, 'Standard-setting from a competition law perspective' (2011) *Competition Policy Newsletter* 3

Schillemans T and Busuioc M, 'Predicting Public Sector Accountability: From Agency Drift to Forum Drift' (2015) 25 *Journal of Public Administration Research and Theory* 191

Schmidt SK, 'Commission Activism: Subsuming Telecommunications and Electricity under European Competition Law' (1998) 5 *Journal of European Public Policy* 169

Schmidt SK, 'Sterile Debates and Dubious Generalisations: European Integration Theory Tested by Telecommunications and Electricity' (1996) 16 *Journal of Public Policy* 233

Schneider V and Dang-Nguyen G, 'Corporate Actor Networks in European Policy-making: Harmonizing Telecommunications Policy' (1994) 32 *Journal of Common Market Studies* 473

Scholten M, 'Independent, hence unaccountable?' (2011) 4 *Review of European Administrative Law* 5

Scholten M, 'Independence vs. Accountability: Proving the Negative Correlation' (2014) 21 *Maas-tricht Journal of European and Comparative Law* 197

Schütze R, 'Re-reading' Dassonville: Meaning and Understanding in the History of European Law' (2018) 24 *European Law Journal* 376

Scott C, 'Private Regulation of the Public Sector: A Neglected Facet of Contemporary Governance' (2002) 29 *Journal of Law and Society* 56

Scott C, 'The Governance of the European Union: The Potential for Multi-Level Control' (2002) 8 *European Law Journal* 59

Shapiro C, 'Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting' (2000) 1 *Innovation Policy and the Economy* 119

Shapiro C, 'Patent Reform: Aligning Reward and Contribution' (2007) 8 *Innovation Policy and the Economy* 111

Shapiro SA and Levy RE, 'Heightened Scrutiny of the Fourth Branch: Separation of Powers and the Requirement of Adequate Reasons for Agency Decisions' (1987) *Duke LJ* 387

Shapiro SA and Steinzor R, 'Capture, accountability, and regulatory metrics' (2007) 86 *Tex L Rev* 1741

Shapiro SP, 'Agency Theory' (2005) 31 *Annual Review of Sociology* 263

Sherman LW, 'Three Models of Organizational Corruption in Agencies of Social Control' (2014) 27 *Social Problems* 478

Shurmer M, 'Telecommunications Standardization And Intellectual Property Rights: A Fundamental Dilemma?' (1995) 3 *StandardView* (New York, NY) 50

Sidak GJ, 'Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro' (2008) 92 *Minnesota Law Review* 714

Sidak GJ, 'The Antitrust Division's Devaluation of Standard-Essential Patents' (2016) 104 *Georgetown Law Journal Online* 48

Sidak JG, 'The Meaning of FRAND, Part I: Royalties' (2013) 9 *Journal of Competition Law and Economics* 931

Sidak GJ, 'The Meaning of FRAND, Part II: Injunctions' (2015) 11 *Journal of Competition Law and Economics* 201

Simcoe T, 'Delays and de jure Standards: What Caused the Slowdown in Internet Standards Development?' (2004) University of Toronto

Sinclair D, 'Self-Regulation Versus Command and Control? Beyond False Dichotomies' (1997) 19 *Law & Policy* 529

Smith KE and others, 'Corporate Coalitions and Policy Making in the European Union: How and Why British American Tobacco Promoted "Better Regulation"' (2015) 40 *Journal of Health Politics, Policy and Law* 325

Sousa DJ and Klyza CM, 'New directions in environmental policy making: An emerging collaborative regime or reinventing interest group liberalism' (2007) 47 *Nat Resources J* 377

Spulber DF, 'Standard Setting Organisations and Standard Essential Patents: Voting and Markets' (2018) *The Economic Journal* 1,

Stewart RB and Sunstein CR, 'Public Programs and Private Rights' (1982) 95 *Harvard Law Review* 1193

Stigler GJ, 'The Theory of Economic Regulation' (1971) 2 *The Bell Journal of Economics and Management Science* 3

Stiglitz JE, 'Towards a broader view of competition policy' (2017) *Competition Policy for the New Era: Insights from the BRICS Countries* 4

Strom K, 'Delegation and Accountability in Parliamentary Democracies' (2000) 37 *European Journal of Political Research* 261

Sunstein CR, 'On the Costs and Benefits of Aggressive Judicial Review of Agency Action' (1989) *Duke LJ* 522

Sunstein CR, 'Interpreting Statutes in the Regulatory State' 103 *Harvard Law Review* 405

Tassey G, 'Standardization in Technology-Based Markets' (2000) 29 *Research Policy* 587

Temple S, 'Trends in Telecommunications Standardization at the European Level' (1988) 11 *Computer Communications* 181

Thatcher M and Stone Sweet A, *The Politics of Delegation* (Frank Cass 2003) 116

Thatcher M, 'Delegation to Independent Regulatory Agencies: Pressures, Functions and Contextual Mediation' (2002) 25 *West European Politics* 125

Thatcher M, 'The Commission and National Governments as Partners: EC Regulatory Expansion in Telecommunications 1979–2000' (2001) 8 *Journal of European Public Policy* 558

Thatcher M, 'Regulation After Delegation: Independent Regulatory Agencies in Europe' (2002) 9 *Journal of European Public Policy* 954

Thatcher M, 'Winners and Losers in Europeanisation: Reforming the National Regulation of Telecommunications' (2004) 27 *West European Politics* 284

Thaw D, 'Enlightened Regulatory Capture' (2014) 89 *Washington Law Review* 329

Tovo C, 'Judicial Review of Harmonized Standards: Changing the Paradigms of Legality and Legitimacy of Private Rulemaking under EU Law' (2018) *Common Market Law Review* 1187

Trappey CV, Trappey AJC and Wang Y-H, 'Are patent trade wars impeding innovation and development?' (2016) 46 *World Patent Information* 64

Treacy P and Lawrance S, 'FRANDly fire: are industry standards doing more harm than good?' (2007) 3 *Journal of Intellectual Property Law & Practice* 22

Tsai J and Wright JD, 'Standard Setting, Intellectual Property Rights, and the Role of Antitrust in Regulating Incomplete Contracts' (2015) 80 *Antitrust Law Journal* 157

Tsilikas H, 'Huawei v. ZTE in Context – EU Competition Policy and Collaborative Standardization in Wireless Telecommunications' (2017) 48 *IIC - International Review of Intellectual Property and Competition Law* 151

Tuckett R, 'ETSI's IPR Policy: The Implications for Companies using European Telecoms Standards' (1993) 10 *Patent World*, 23-7

Van Empel M, 'The 1992 Programme: Interaction Between Legislator And Judiciary' (1992) *LIEI* 1

Vatn A and Bromley DW, 'Externalities — A Market Model Failure' (1997) 9 *Environmental and Resource Economics* 135

Veljanovski CG, 'The Coase Theorems and the Economic Theory of Markets and Law' (1982) 35 *Kyklos* 53

Verbruggen P, 'Does Co-Regulation Strengthen EU Legitimacy?' (2009) 15 *European Law Journal* 425

Von Graevenitz G, Wagner S and Harhoff D, 'How to measure patent thickets — A novel approach' (2011) 111 *Economics Letters* 6

Vos E, 'Reforming the European Commission: What Role to Play for EU Agencies?' (2000) *Common Market Law Review* 1113

Wagner RP, 'Information Wants to Be Free: Intellectual Property and the Mythologies of Control' (2003) 103 *Columbia Law Review* 995

Wallace JM, 'Rambus v. F. T.C. in the Context of Standard-Setting Organizations, Antitrust, and the Patent Hold-up Problem' (2009) 24 *Berkeley Technology Law Journal* 661

- Waterman RW and Meier KJ, 'Principal-Agent Models: An Expansion?' (1998) 8 *Journal of Public Administration Research and Theory* 173
- Waverman L and Sirel E, 'European Telecommunications Markets on the Verge of Full Liberalization' (1997) 11 *The Journal of Economic Perspectives* 113
- Weber RH, 'Competition Law versus FRAND Terms in IT Markets' (2011) *World Competition* 51
- Weiler J, 'The Transformation of Europe' (1991) 100 *Yale LJ* 2403
- Weingast BR, 'The Congressional-Bureaucratic System: A Principal Agent Perspective (with applications to the SEC)' (1984) 44 *Public Choice* 147
- Weiss MBH and Sirbu M, 'Technological Choice in Voluntary Standards Committees: An Empirical Analysis' (1990) 1 *Economics of Innovation and New Technology* 111
- Werder AV, 'Corporate Governance and Stakeholder Opportunism' (2011) 22 *Organization Science* 1345
- West W, 'Administrative Rulemaking: An Old and Emerging Literature' (2005) 65 *Public Administration Review* 655
- White EL, 'In Search of the Limits to Article 30 of the EEC Treaty' (1989) 26 *Common Market Law Review* 235
- Wilkinson S, 'They're Stealing Our Diamonds: The Standards Assault on Patents' (1991) 8 *Revue Canadienne de Propriete Intellectuelle* 193
- Wilson D and others, 'CJEU permits standard essential patent (SEP) injunctions against infringers who engage in delaying tactics or do not respond diligently with a good faith counter-offer' (2015) 37 *European Intellectual Property Review* 741
- Witt AC, 'Public Policy Goals Under EU Competition Law—Now is the Time to Set the House in Order' (2012) 8 *European Competition Journal* 443
- Wu T, *The Curse of Bigness : Antitrust in the New Gilded Age* (Columbia Global Reports 2018); Hovenkamp HJ, 'Is Antitrust's Consumer Welfare Principle Imperilled?' (2019) *Faculty Scholarship at Penn Law* 1985
- Ziedonis R, 'Don't Fence Me In: Fragmented Markets for Technology And The Patent Acquisition Strategies Of Firms' (2004) 50 *Management Science* 804
- Zingales N and Kanevskaia O, 'The IEEE-SA Patent Policy Update under the Lens of EU Competition Law' (2016) 12 *European Competition Journal* 195
- Zingales N, 'The Legal Framework for SEP Disputes in the EU Post-Huawei: Whither Harmonization?' (2017) 36 *Yearbook of European Law* 628
- Zinn MD, 'Policing Environmental Regulatory Enforcement: Cooperation, Capture, and Citizen Suits' (2002) 21 *Stan Env'tl LJ* 81

Reports & Studies

Bekkers R and Seo D, *Quick Scan for Best Practices in ICT Standardization: What ETSI Could Learn from other Standards Bodies* (Commissioned by the Directorate of Energy and Telecommunications, Dutch Ministry of Economic Affairs Utrecht, Netherlands: Dialogic, 2008)

Blind K and others, *EU Study on the Interplay between Standards and Intellectual Property Rights (IPRs)* (Commissioned by the Directorate General for Enterprise and Industry of the European Commission, Fraunhofer Institute for Communication System, Dialogic, 2011)

Blind K and others, *Study on the Interaction between Standardisation and Intellectual Property Rights* (Fraunhofer Institute Systems and Innovation Research, Karlsruhe, 2002)

Crémer J, de Montjoye Y, Schweitzer H, *Competition Policy for the Digital Era* (Report for the European Commission, 2019)

Digital Competition Expert Panel, 'Unlocking Digital Competition' (2019) available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf accessed on 1 September 2019

Directorate for Financial and Enterprise Affairs Competition Committee of the Organisation for Economic Co-operation and Development (OECD), 'Standard Setting' (2010) available at <http://www.oecd.org/daf/competition/47381304.pdf> accessed on 1 September 2019

Egan M, *Regulating European Markets: Mismatch, Reform and Agency* (ProQuest Dissertations Publishing 1996)

Ernst & Young, *Independent Review of the European Standardisation System: Final Report* (2015) available at <https://publications.europa.eu/en/publication-detail/-/publication/9d26ee6e-c146-4fca-b7d8-c537e0a1965b> accessed on 1 September 2019

ETSI, 'Annual Report 2019' (2019) available at <https://www.etsi.org/images/files/AnnualReports/etsi-annual-report-april-2019.pdf> accessed on 1 September 2019.

European Commission, 'Pharmaceutical Sector Inquiry - Preliminary Report (DG Competition Staff Working Paper)' (2008) available at http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/preliminary_report.pdf accessed on 1 September 2019

European Commission, *Standardisation to Support Digitisation: Report from the Workshop on Standardisation to Support Digitising European Industry* (Brussels, 17 October 2017)

European Parliamentary Research Service (EPRS), 'EU Agencies, Common Approach and Parliamentary Scrutiny (Study)' (2018) 1

Hall BH, Graevenitz VG and Rosazza-Bondibene C, *A Study of Patent Thickets* (UK Intellectual Property Office, 2013) available at <http://www.ipo.gov.uk/ipresearch-thickets.pdf> 1 September 2019

- Iplytics, 'Empirical Study on Patenting and Standardization Activities at IEEE' (2017)
- Iplytics, 'IEEE's Empirical Record of Success and Innovation Following Patent Policy Updates' (2018)
- Iplytics, 'Empirical Analysis of Technical Contributions to IEEE 802 Standards' (2019)
- Joskow P and Noll R, 'Regulation in Theory and Practice: An Overview' in Fromm G (ed), *Studies in Public Regulation* (National Bureau of Economic Research, Inc 1981)
- Knut Blind and others, *Study on the Interplay between Standards and Intellectual Property Rights (IPRs) – Final Report* (Fraunhofer Institute for Communication System and Dialogic, 2011)
- Organization for Economic Co-operation and Development (OECD), 'Regulatory Reform and Innovation' available at <https://www.oecd.org/sti/inno/2102514.pdf> accessed 1 September 2019
- Organization for Economic Co-operation and Development (OECD), 'Report on Regulatory Reform' (Paris, 1997)
- Organization for Economic Co-operation and Development (OECD), 'Regulatory Impact Analysis – Best Practices in OECD Countries' (1997)
- Organization for Economic Co-operation and Development (OECD), 'Standard Setting' (2010), DAF/COMP(2010)33
- Pentheroudakis C and Baron JA, *Licensing Terms of Standard Essential Patents: Comprehensive Analysis of Cases*, (JRC Science for Policy Report, 2017)
- Pohlmann T and Blind K, *Landscaping Study on Standard Essential Patents (SEPs)* (Iplytics GmbH, Technical University of Berlin, 2016)
- Régibeau P, De Coninck R, and Zenger H, 'Transparency, Predictability, and Efficiency of SSO-based Standardization and SEP Licensing: A Report for the European Commission' (2016)
- Short JL, 'From Command-and-Control to Corporate Self-Regulation: How Legal Discourse and Practice Shape Regulatory Reform' (University of California, Berkeley 2008).
- Swann GP, *The Economics of Standardization: An Update*, (Report for the UK Department of Business, Innovation and Skills (BIS), 2010) available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/461419/The_Economics_of_Standardization_-_an_update_.pdf accessed 1 September 2019
- The European Centre for International Political Economy (ECIPE), *Standing Up for Competition: Market Concentration, Regulation, and Europe's Quest for a New Industrial Policy* (2019)
- The European Competitiveness and Sustainable Industrial Policy Consortium, 'Patents and Standards: A Modern Framework for IPR-based Standardization' (2014)

The German Association for the Protection of Intellectual Property (“Deutsche Vereinigung für gewerblichen Rechtsschutz und Urheberrecht e.V.”) ‘Comments submitted by the German Association for the Protection of Intellectual Property (GRUR) concerning the Commission’s Public Consultation on “Patents and Standards – A modern framework for standardisation involving IPR”’ (2015)

Thumm N and Gabison G, ‘Patent Assertion Entities in Europe: Their Impact on Innovation and Knowledge Transfer in ICT Markets’ (Joint Research Centre, European Economics, 2016)

UK Intellectual Property Office Patent Informatics Team, ‘Patent Thickets, Licensing and Standards’ available at <https://webarchive.nationalarchives.gov.uk/20140603125148/http://www.ipo.gov.uk/ipreview-doc-aa.pdf> accessed on 1 September 2019

UK Intellectual Property Office Patent Informatics Team, ‘Patent Thickets’ (2011) available at <http://www.ipo.gov.uk/informatic-thickets.pdf> accessed on 1 September 2019

United States International Trade Commission, ‘The Effects of Greater Economic Integration within the European Community on the United States: Fifth Followup Report Investigation No. 332-267’ (1993) USITC Publication 2628 1

World Intellectual Property Organization (WIPO), *Report 2017: Intangible Capital in Global Value Chains* (Geneva: World Intellectual Property Organization 2017) available at https://www.wipo.int/edocs/pubdocs/en/wipo_pub_944_2017.pdf accessed on 1 September 2019

Conference Papers

Bekkers R and Updegrave AS, *IPR Policies and Practices of a Representative Group of Standards-Setting Organizations Worldwide* (Committee on Intellectual Property Management in Standard-Setting Processes National Research Council, Washington, DC, 2013) available at http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_072197.pdf accessed on 1 September 2019

Bekkers R, Iversen E and Blind K, *Patent Pools And Non-Assertion Agreements: Coordination Mechanisms For Multi-Party IPR Holders In Standardization* (EASST 2006 Conference) available at https://www.researchgate.net/profile/Knut_Blind/publication/228637765_Patent_pools_and_non-assertion_agreements_coordination_mechanisms_for_multi-party_IPR_holders_in_standardization/links/0fcfd5114a752b4aba000000.pdf accessed on 1 September 2019

European Patent Office Economic and Scientific Advisory Board, Workshop on Patent Thickets (2012) available at [http://documents.epo.org/projects/baby-lon/eponot.nsf/0/B58781F239B083CEC1257B190038E433/\\$FILE/workshop_patent_thickets_en.pdf](http://documents.epo.org/projects/baby-lon/eponot.nsf/0/B58781F239B083CEC1257B190038E433/$FILE/workshop_patent_thickets_en.pdf) accessed on 1 September 2019

Geradin D, et al., The Ex Ante Auction Model for the Control of Market Power in Standard Setting Organizations, CEMFI Working Paper 0703 (May 2007), available at SSRN: <https://ssrn.com/abstract=979393> accessed on 1 September 2019

Gilardi F, 'Principal-Agent Models Go to Europe: Independent Regulatory Agencies as Ultimate Step of Delegation' (ECPR General Conference, Canterbury, 2001)

Goodman DJ and Myers RA, '3G Cellular Standards and Patents' (International Conference on Wireless Networks, Communications and Mobile Computing, 2005)

Hodge G, 'Governing the Privatised State: New Accountability Guardians' (Accountable Governance: An International Research Colloquium', Queen's University, Belfast, 20–22 October 2005)

Iversen EJ, 'Standardization and Intellectual Property Rights: ETSI's Controversial Search for New IPR-Procedures' (IEEE Conference on Standardisation and Innovation in Information Technology, Aachen, September 1999)

Jakobs K, 'Standardisation in Information Technology' (Proceedings of the 34th Annual Hawaii International Conference on System Sciences, 06 January 2001) <https://ieeexplore.ieee.org/document/926523/media> accessed 1 September 2019

Johannes Laitenberger, Director-General for Competition, European Commission, 'Enforcing EU competition law in a time of change: "Is Disruptive Competition Disrupting Competition Enforcement?"' (W@competition Conference, Brussels, 1 March 2018) available at http://ec.europa.eu/competition/speeches/text/sp2018_03_en.pdf accessed on 1 September 2019

Katznelson RD, 'Perilous deviations from FRAND harmony- operational pitfalls of the 2015 IEEE patent policy' (IEEE 9th International Conference on Standardization and Innovation in Information Technology (SIIT), 2015)

Katznelson RD, 'The IEEE controversial policy on Standard Essential Patents – the empirical record since adoption' (Symposium on Antitrust, Standard Essential Patents, and the Fallacy of the Anticommons Tragedy, Berkeley, CA, 2016)

Keech WR, Munger MC and Simon C, 'Market Failure and Government Failure' (Public Choice World Congress, Miami, 2012)

Sangoon Y and Taehyun J, Co-evolution of Markets for Technology and Markets for Products in Mobile Telecommunication Standards: Examination of Essential Patents for GSM, WCDMA, and LTE Standards (Proceedings of PICMET '14 Conference: Portland International Center for Management of Engineering and Technology; Infrastructure and Service Integration, 2014)

Thatcher M, 'Delegation to Independent Regulatory Agencies in Western Europe', (Paper presented to the workshop on "National Regulatory Reform in an Internationalised Environment", ECPR Joint Sessions of Workshops, Grenoble, 6-11 April 2001).

Official Documents

Economic and Social Committee, 'Opinion on the problems of trade barriers and the alignment of laws in this area', OJ C 72, 24 March 1980

European Commission, 'European Governance - A White Paper' COM(2001) 428 final OJ C 287 of 12.10.2001

European Commission, 'General Guidelines for The Cooperation Between CEN, CENELEC and ETSI and the European Commission and The European Free Trade Association' OJ C91/7

European Commission, 'Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services' OJ 2018/C 159/12

European Commission, Communication 'on Actions Taken Following the Resolutions on European Standardisation Adopted by the Council and the European Parliament in 1999' COM(2001) 527 final

European Commission, Communication 'Towards an increased contribution from standardisation to innovation in Europe' COM(2008) 133 final

European Commission, Communication 'A Strategic Vision for European Standards: Moving Forward to Enhance and Accelerate the Sustainable Growth of the European Economy by 2020' COM(2011) 311 final

European Commission, Communication on 'Better regulation for better results: An EU agenda' COM(2015) 215 final

European Commission, Communication decision on setting up a group of experts on licensing and valuation of standard essential patents, COM(2018) 4161 final

European Commission, Green Paper on 'The Development Of European Standardization Action for Faster Technological Integration in Europe' COM(90) 456 final

European Commission, Notice 'The 'Blue Guide' on the implementation of EU products rules 2016' OJ C 272/1

European Commission, Notice 'Guidelines on the applicability of Article 81 of the EC Treaty to horizontal cooperation agreements (Text with EEA relevance)' (2001) OJ C 3

European Commission on 'Standardization and the Global Information Society the European Approach' COM(96) 359 final

European Commission on 'the role of European standardisation in the framework of European policies and legislation' COM(2004) 674 final

European Commission Press Release, Commission welcomes changes in ETSI IPR rules to prevent 'patent ambush', IP/05/1565

European Commission Recommendation (2003/311/EC) of 11 February 2003 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC, OJ L 114/45

European Commission Recommendation (2007/879/EC) of 17 December 2007, OJ L 344/65

European Commission Recommendation (2014/710/EU), on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services Text with EEA relevance [2014] OJ L 295/79

European Commission Recommendation (2003/311/EC) of 11 February 2003 on Relevant Product and Service Markets within the Electronic Communications Sector Susceptible to Ex Ante Regulation in Accordance with Directive 2002/21/EC of the European Parliament and of the Council on a Common Regulatory Framework for Electronic Communication Networks and Services [2003] L 114 OJ/45

European Commission Report from the Commission to the Council and the European Parliament on Efficiency And Accountability In European Standardisation Under The New Approach, COM(1998) 291 final

European Commission, Staff Working Document 'Better Regulation Guidelines' SWD (2017) 350

European Commission Staff Working Document, 'Explanatory Note, Accompanying the document Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services' SWD(2014) 298, 9.10.2014

European Commission, Staff Working Document: Vademecum on European Standardisation in support of Union Legislation and policies PART I Role of the Commission's Standardisation requests to the European standardisation organisations, SWD(2015) 205 final

European Commission, 'Joint Initiative on Standardisation under the Single Market Strategy' (2016)

European Commission, 'A Digital Agenda for Europe', COM(2010)245 final,

European Commission, 'A Digital Single Market Strategy for Europe', COM(2015) 192 final

European Commission, 'Action Plan for the Single Market', CSE(97)1 final, 4 June 1997

European Commission, 'Communication from the Commission concerning the consequences of the judgment given by the Court of Justice on 20 February 1979 in Case 120/78 ('Cassis de Dijon')' (1980) OJ C256/2

European Commission, 'Communication from the Commission to the Council and to the European Parliament on Technical harmonization and standards: a new approach' (1985) COM (85) 19 final

European Commission, 'Completing the Internal Market' White Paper from the Commission to the European Council (1985) COM (85) 310 final

European Commission, 'Directive based on the provisions of Article 33 (7), on the abolition of measures which have an effect equivalent to quantitative restrictions

on imports and are not covered by other provisions adopted in pursuance of the EEC Treaty' 70/50/EEC, OJ L 13

European Commission, 'Green Paper on Vertical Restraints in EC Competition Policy' COM(96) 721 final

European Commission, 'Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings' (2009) OJ C45/7

European Commission, 'Guide to the Implementation of Directives Based on the New Approach and the Global Approach' (2000)

European Commission, 'Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-Operation Agreements' (2011) OJ C11/01

European Commission, 'ICT Standardisation Priorities for the Digital Single Market', COM(2016) 176 final

European Commission, 'Intellectual Property Rights and Standardization' COM (92) 445 final

European Commission, 'Mid-Term Review on the implementation of the Digital Single Market Strategy', COM(2017) 228 final

European Commission, 'Notice Pursuant to Article 19(3) of Council Regulation No. 17 concerning case No. IV/35.006, ETSI Interim IPR Policy' OJ C76/5, 28.03.1995

European Commission, 'Press Release Antitrust: Commission fines US chipmaker Qualcomm €242 million for engaging in predatory pricing', (2019) IP/19/4350, 18 July 2019

European Commission, 'Public-Private Partnerships in Horizon 2020: A Powerful Tool to Deliver on Innovation and Growth in Europe', COM(2013) 494 final, 10.7.2013

European Commission, 'Upgrading the Single Market: more opportunities for people and business' COM(2015) 550 final, 28.10.2015

European Commission, 'Vademecum on European Standardisation – Part I: General framework' (2003)

European Commission, A Digital Agenda for Europe, COM(2010)245 final

European Commission, A strategic vision for European standards: Moving forward to enhance and accelerate the sustainable growth of the European economy by 2020, COM(2011) 311 final

European Commission, Communication from the Commission 'Action plan "Simplifying and improving the regulatory environment"', COM(2002) 278 final

European Commission, Communication on 'Towards a reinforced culture of consultation and dialogue - General principles and minimum standards for consultation of interested parties by the Commission', COM(2002) 704 final

European Commission, Communication on Better Regulation for Growth and Jobs in the European Union, COM(2005) 97 final

European Commission, Communication on European agencies – The way forward, COM(2008) 135 final, 11.3.2008

European Commission, Communication on Impact Assessment, COM(2002) 276 final

European Commission, Communication on Intellectual Property Rights and Standardisation, COM (1992) 445

European Commission, Communication on Regulatory Fitness and Performance Programme (REFIT): State of Play and Outlook, COM(2014) 368 final

European Commission, Communication on Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final

European Commission, Communication on Simpler Legislation For The Internal Market (SLIM): A Pilot Project, COM(96) 204 final

European Commission, Communication on Smart Regulation in the European Union, COM(2010) 543 final

European Commission, Green Paper on the development of the common market for telecommunications services and equipment, COM(87) 290 final

European Commission, ICT Standardisation Priorities for the Digital Single Market, COM(2016) 176 final

European Commission, Impact Assessment Guidelines, SEC(2005) 791

European Commission, Press release - Antitrust: Commission opens two formal investigations against chipset supplier Qualcomm (2015) IP/15/5383

European Commission, Press Release ‘Antitrust: Commission accepts legally binding commitments by Samsung Electronics on standard essential patent injunctions’ (2014) IP/14/490

European Commission, Press Release ‘Antitrust: Commission closes formal proceedings against Qualcomm’ (2009) MEMO/09/516

European Commission, Press Release ‘Antitrust: Commission confirms sending a Statement of Objections to Rambus’ (2007) MEMO/07/330

European Commission, Press Release ‘Antitrust: Commission initiates formal proceedings against Qualcomm’ (2007) MEMO/07/389

European Commission, Press Release ‘Antitrust: Commission opens proceedings against Samsung’ (2012) IP/12/89

European Commission, Press Release Antitrust: Commission sends two Statements of Objections on exclusivity payments and predatory pricing to Qualcomm, (2015) IP/15/6271

European Commission, Press Release on ‘Competition: Commission welcomes changes ETSI IPR rules to prevent ‘patent ambush’ (2005) IP/05/1565

European Commission, Press Release: Antitrust clearance for licensing of patents for third generation mobile services, (2002) IP/02/1651

European Commission, Press Release: Commission sets out path to digitise European industry, (2016) IP/16/1407

European Commission, Press Release on 'Digital Single Market for Europe: Commission sets out 16 initiatives to make it happen' (2015) IP/15/4919.

European Commission, Public-private partnerships in Horizon 2020: a powerful tool to deliver on innovation and growth in Europe, COM(2013) 494 final, 10.7.2013

European Commission, Setting out the EU approach to Standard Essential Patents, COM(2017) 712 final, 29.11.2017

European Commission, Staff Working Document on 'Better Regulation Guidelines' SWD (2017) 350

European Commission, Staff Working Document on 'Better Regulation Guidelines' SWD(2015) 111 final

European Commission, Staff Working Paper 'Executive Summary of the Impact Assessment Accompanying the document Proposal for a Regulation Of The European Parliament And Of The Council on European Standardisation and amending Council Directives 89/686/EEC and 93/15/EEC and Directives 94/9/EC, 94/25/EC, 95/16/EC, 97/23/EC, 98/34/EC, 2004/22/EC, 2007/23/EC, 2009/105/EC and 2009/23/EC', SEC (2011) 672 final, 1.6.2011

European Commission, Staff Working Paper 'The 1996 Single Market Review: Background Information for The Report To The Council And European Parliament' (1996) SEC (96) 2378

European Commission, Staff working paper on 'Competition Policy 2011' [2012] SWD (2012) 141 final

European Commission, State of the Innovation Union 2012 - Accelerating change: communication, COM(2013) 149 final

European Commission, Towards a Dynamic European Economy, Green Paper on The Development of the Common Market for Telecommunications Services and Equipment, COM (87) 290 final

European Commission, White Paper - Modernising ICT Standardisation in the EU - The Way Forward, COM(2009) 324 final

European Commission, White Paper from the Commission to the European Council, 'Completing the Internal Market' (1985) COM (85) 310 final

European Commission, White Paper on European Governance, COM (2001) 428 final, 25.7.2001

European Commission, Working Paper on the 'Role of the Authorities in Standardization Under The New Approach' (1999) SOGS N302

European Communities — Commission, 'Europe Without Frontiers - Completing the Internal Market (2nd ed. European Documentation)' (1988) 1

European Council Recommendation (84/549/EEC) concerning the implementation of harmonization in the field of telecommunications [1984] OJ L 298/49

European Council Resolution 'on the Role of European Standardisation in the European Economy' OJ 1992 C 173/1

European Council Resolution 'on the role of Standardisation in Europe' of 28 October 1999 OJ C 141

European Council Resolution of 7 May 1985, on a new approach to technical harmonization and standards (1985) 85/C 136/01

European Council Resolution, 'General Programme of 28 May 1969 for the elimination of technical barriers to trade which result from disparities between the provisions laid down by law, regulation or administrative action in Member States' OJ C 76

European Council, Resolution on the Role of European standardisation in the European Economy, OJ 1992 C 173/9

European Council, Resolution on the role of standardisation in Europe, OJ C 141/01, 28 October 1999

European Parliament and of the Council, 'On the coordinated introduction of a third-generation mobile and wireless communications system (UMTS) in the Community', Decision No 128/1999/EC of the 14 December 1998

European Parliament and the Council, Decision No 768/2008/EC on a common framework for the marketing of products, and repealing Council Decision 93/465/EEC, L 218/82

European Parliament, Council of the European Union and European Commission, Interinstitutional Agreement on Better Law-Making Between the European Parliament, OJ 2003 C321/1

Electronic Sources & News Articles

American Standards Association, 'Procedures of American Standards Association' (1959)

ANSI, 'Introduction to ANSI' available at https://www.ansi.org/about_ansi/introduction/introduction?menuid=1 accessed on 1 September 2019

Apple, 'Apple to acquire the majority of Intel's smartphone modem business' available at <https://www.apple.com/newsroom/2019/07/apple-to-acquire-the-majority-of-intels-smartphone-modem-business/> accessed on 1 September 2019.

Bar T and Leiponen A, 'Collaboration and Networking in Cooperative Standard Setting' (2009) available at <http://www.cerna.mines-paristech.fr/Donnees/data04/485-BarLeiponen09Nov25.pdf> accessed on 1 September 2019

Baron J and Delcamp H, 'Strategic Inputs into Patent Pools' (2010) 1 available at <https://ssrn.com/abstract=1641265> accessed on 1 September 2019

Bessen JE, 'Patent thickets: Strategic patenting of complex technologies' (2003) available at <https://ssrn.com/abstract=327760> accessed on 1 September 2019

BSI, 'Memorandum of Understanding (MoU) between the United Kingdom Government and the British Standards Institution' (2002) paras 1.4 and 2.4 available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/461415/Memorandum_of_Understanding.pdf accessed on 1 September 2019

Bull RT, 'Combatting External and Internal Regulatory Capture: The Regulatory Review' (2016) available at <https://www.theregreview.org/2016/06/20/bull-combatting-external-internal-regulatory-capture/> accessed on 1 September 2019

Business Review Letter to the Institute of Electrical and Electronics Engineers (2 February 2015) available at <http://www.justice.gov/atr/public/busreview/311470.htm> accessed on 1 September 2019

BusinessWire, 'Strategy Analytics: Q1 2018 Baseband Market Share: Samsung LSI Overtakes MediaTek' available at <https://www.business-wire.com/news/home/20180731005614/en/Strategy-Analytics-Q1-2018-Baseband-Market-Share> accessed on 1 September 2019

Cnet, 'Why Apple Wants Intel's Modem Business' (2019) available at <https://www.cnet.com/news/why-apple-wants-intels-modem-business/> accessed on 1 September 2019.

Den Hertog J, 'Review of Economic Theories of Regulation', (2010) 1, 16 available at <https://www.uu.nl/en/files/rebousedp201010-18pdf> accessed on 1 September 2019

Diez MFJ, Fan J and Villegas-Sánchez C, 'Global declining competition' (2019) 82 IMF Working Papers; Economist, 'A Giant Problem: The Rise of the Corporate Colossus Threatens Both Competition and the Legitimacy of Business' (2016) available at <https://www.economist.com/leaders/2016/09/17/a-giant-problem> accessed on 1 September 2019

Dirk Weiler, Standards related patent quality, A view from a standardisation organization, EC/EPO Workshop on 'Tensions Between Intellectual Property Rights and Standardisation: Reasons and Remedies' Brussels, November 22, 2010, presentation available at https://web.archive.org/web/20110318082847/http://ec.europa.eu/enterprise/sectors/ict/files/ict-policies/5_weiler_en.pdf accessed on 1 September 2019

DTI, 'The Public Policy Interest in the UK in Standardisation' (2000) available at <https://webarchive.nationalarchives.gov.uk/20070628230000/http://www.dti.gov.uk/files/file11318.pdf> accessed on 1 September 2019

Duhigg C and Lohr S, 'The Patent, Used as a Sword' (2012) NY Times available at <https://www.nytimes.com/2012/10/08/technology/patent-wars-among-tech-giants->

can-stifle-competition.html?action=click&module=RelatedCoverage&pgtype=Article®ion=Footer accessed on 1 September 2019

Egan EJ and Teece DJ, 'Untangling the Patent Thicket Literature' (2015) 1, 12 available at <https://scholarship.rice.edu/bitstream/handle/1911/92003/McN-PatentThicket-Egan-092215.pdf?sequence=1&isAllowed=y> accessed on 1 September 2019

Ernst D, 'Standard-Essential Patents within Global Networks-An Emerging Economies Perspective' (2016) 1, 6 available at <https://ssrn.com/abstract=2873198> accessed on 1 September 2019

ETSI, 'ETSI IPR committee progresses on Injunctive Relief' (ETSI, 2013) <https://www.etsi.org/news-events/news/732-2013-12-news-release-ipr-committee> accessed on 1 September 2019

ETSI, '2019 Contributions to ETSI' available at <https://www.etsi.org/images/files/membership/ContriForm.pdf> accessed on 1 September 2019

ETSI, 'ETSI Annual Report 2019' (2019) 1, 55 available at <https://www.etsi.org/images/files/AnnualReports/etsi-annual-report-april-2019.pdf> accessed on 1 September 2019

ETSI, 'ETSI Directive' available at <https://portal.etsi.org/Resources/ETSIDirectives.aspx> accessed on 1 September 2019

ETSI, 'ETSI General Assembly re-elects Dirk Weiler as Board Chairman' (2017) available at <https://www.etsi.org/newsroom/news/1242-2017-11-news-etsi-general-assembly-reelects-dirk-weiler-as-board-chairman> accessed on 1 September 2019

ETSI, 'ETSI IPR committee continues discussions on injunctive relief' (ETSI, 2014) <https://www.etsi.org/news-events/news/812-2014-07-news-etsi-ipr-committee-continues-discussions-on-injunctive-relief> accessed on 1 September 2019

ETSI, 'ETSI Role in Europe: Supporting European Regulation and Legislation', available at <http://www.etsi.org/about/what-we-are/role-in-europe> accessed on 1 September 2019

ETSI, 'IPR dialogue continues at ETSI' (2013) <https://bit.ly/2NFOJ8G> accessed on 1 September 2019

ETSI, 'Long-Term Strategy 2016-2021', available at https://www.etsi.org/images/files/Brochures/ETSI_LTS%20Brochure_WEB.pdf accessed on 19 November 2018

ETSI, 'Presiding judge of the X. senate of the German federal supreme court, Dr. Peter Meier-Beck, addresses the ETSI IPR Special Committee' (2013) available at <https://bit.ly/2ZxP8Ao> accessed on 1 September 2019

ETSI, 'Standards and Society: the ETSI 3SI Programme' (2017) available at <https://www.etsi.org/images/files/Brochures/ETSI-3SI-Brochure-WEB.pdf> accessed on 1 September 2019

ETSI, 'The ETSI Long-Term Strategy' available at https://www.etsi.org/images/files/Brochures/ETSI_LTS%20Brochure_WEB.pdf accessed on 1 September 2019

ETSI, 'Update from ETSI IPR committee' (2014) <https://www.etsi.org/news-events/events/9-news-events/news/757-2014-03-update-from-etsi-ipr-committee> accessed on 1 September 2019

European Commission, 'A Digital Single Market for the benefit of all Europeans: Towards a More United, Stronger and More Democratic Union', (2019) available at https://ec.europa.eu/commission/sites/beta-political/files/euco-sibiu-a_digital_single_market.pdf accessed on 1 September 2019

European Commission, 'Better Regulation Toolbox' available at http://ec.europa.eu/smart-regulation/guidelines/docs/br_toolbox_en.pdf accessed on 1 September 2019

European Commission, 'Brochure: The Joint Initiative on Standardisation' (2019) available at <https://ec.europa.eu/docsroom/documents/35781?locale=en> accessed on 1 September 2019

European Commission, 'ICT and Standardisation' available at <https://ec.europa.eu/digital-single-market/en/standardisation> accessed on 1 September 2019

European Commission, 'REFIT – Making EU Law Lighter, Simpler and Less Costly' available at http://ec.europa.eu/smart-regulation/docs/refit_update.pdf accessed 1 September 2019

European Commission, 'Using standards to support growth, competitiveness and innovation' (2014) 1, 29 available at <https://publications.europa.eu/s/lo08> accessed on 1 September 2019

European Commission, Mandelkern Group on Better Regulation Final Report, (2001) available at http://ec.europa.eu/smart-regulation/better_regulation/documents/mandelkern_report.pdf accessed on 1 September 2019

European Economic and Social Committee, 'European Self- and Co-regulation' (2003) available at https://www.eesc.europa.eu/sites/default/files/resources/docs/auto_coregulation_en--2.pdf accessed on 1 September 2019.

European Economic and Social Committee, 'European Self- and Co-Regulation', available at https://www.eesc.europa.eu/resources/docs/auto_coregulation_en--2.pdf accessed on 1 September 2019

European Parliament, 'Accountability of EU Regulatory Agencies' (2015) available at [http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_ATA\(2015\)549017](http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_ATA(2015)549017) accessed on 1 September 2019

European Parliament, 'Free movement of goods | EU fact sheets | European Parliament' (2019) available at http://www.europarl.europa.eu/ftu/pdf/en/FTU_2.1.2.pdf accessed on 1 September 2019

Fair Standards Alliance (FSA) available at <https://fair-standards.org/about-us-2/> accessed on 1 September 2019

FOSSpatnets, 'Qualcomm's Two Mutually-Reinforcing Monopolies: SEP Thicket, Baseband Processor Chipsets' available at <http://www.foss-patents.com/2017/02/qualcomms-two-mutually-reinforcing.html> accessed on 1 September 2019

France and Germany, 'A Franco-German Manifesto for a European industrial policy fit for the 21st Century' in which they contemplate a revised framework of competition law rules. See 'A Franco-German Manifesto for a European industrial policy fit for the 21st Century' available at https://www.bmw.de/Redaktion/DE/Downloads/F/franco-german-manifesto-for-a-european-industrial-policy.pdf?__blob=publicationFile&v=2 accessed on 1 September 2019

FTC Commissioner Terrell McSweeney, 'Holding the Line on Patent Holdup: Why Antitrust Enforcement Matters' (2018) available at https://www.ftc.gov/system/files/documents/public_statements/1350033/mcsweeney_-_the_reality_of_patent_hold-up_3-21-18.pdf accessed on 1 September 2019

FTC, 'FTC Charges Qualcomm With Monopolizing Key Semiconductor Device Used in Cell Phones' (2017) available at <https://www.ftc.gov/news-events/press-releases/2017/01/ftc-charges-qualcomm-monopolizing-key-semiconductor-device-used> accessed on 1 September 2019

FTC, 'FTC Testifies Before Congress on Standard Essential Patents and How Patent "Hold-Up" Affects Competition' (2013) available at <https://www.ftc.gov/news-events/press-releases/2013/07/ftc-testifies-congress-standard-essential-patents-how-patent-hold> accessed on 1 September 2019

Garcia DL, Leickly BL and Willey S, 'Public and Private Interests in Standard Setting: Conflict or Convergence' in (2005) 1, 16 available at <https://blogs.commons.georgetown.edu/cctp-644-fall2015/files/2015/09/Wk2-Public-and-Private-Interests-in-Standard-Setting-Conflict-or-Convergence.pdf> accessed on 1 September 2019.

Geradin D and Petit N, 'The Development of Agencies at EU and National Levels: Conceptual Analysis and Proposals for Reform' (2004) 1, 4 available at <https://ssrn.com/abstract=489722> accessed on 1 September 2019.

Google, 'Facts about Google's acquisition of Motorola' available at <https://www.google.com/press/motorola/> accessed on 1 September 2019.

GSM Association, 'Memorandum of Understanding on the Implementation of a Pan European 900 MHz Digital Cellular Mobile Telecommunications Service by 1991' (1987) available at http://www.gsm-history.org/fileadmin/user_upload/GSM_MoU/GSM_MOU_1987.pdf accessed on 1 September 2019

Gupta K and Effraimidis G, 'IEEE Patent Policy Revisions: An Empirical Examination of Impact' (2018) <https://papers.ssrn.com/abstract=3173799> accessed October 1 September 2019

Hovenkamp E, 'FTC v. Qualcomm: New Frontiers in the Antitrust-IP Interface' (2019) 1, 3-4 available at <https://ssrn.com/abstract=3397312> accessed on 1 September 2019

Huawei, 'Huawei Reassures Licensing Commitment Regarding Certain IEEE Standards' available at <https://www.huawei.com/en/about-huawei/declarations/huawei-reassures-licensing-commitment-regarding-ieee> accessed on 1 September 2019

Huber, Bertram, 'Why the ETSI IPR Policy Does Not and Has Never Required Compulsory 'License to All': A Rebuttal to Karl Heinz Rosenbrock' (2017) available at <https://ssrn.com/abstract=3038447> accessed on 1 September 2019

Institute of Electrical and Electronic Engineers Standards Association, 'IEEE-SA Standards Board Bylaws', Section 6: Patents (2017),

Intel, 'Intel to Exit 5G Smartphone Modem Business, Focus 5G Efforts on Network Infrastructure and Other Data-Centric Opportunities' (2019) available at <https://intel.ly/31dNzVv> accessed on 1 September 2019

International Data Corporation (IDC), 'Smartphone Market Share' (2019) available at <https://www.idc.com/promo/smartphone-market-share/os> accessed on 1 September 2019

Jacob R and Milner A, 'Lessons from Huawei v. ZTE' (2016) 1, 11 available at https://www.4ipcouncil.com/download_file/view_inline/182 accessed on 1 September 2019

Japan Fair Trade Commission, 'Partial Amendment of "Guidelines for the Use of Intellectual Property under the Antimonopoly Act' (2016) available at <https://www.jftc.go.jp/en/pressreleases/yearly-2016/January/160121.html> accessed on 1 September 2019

Joerges C and others, 'European Product Safety, Internal Market Policy and the New Approach to Technical Harmonisation and Standards' (1997) <http://hdl.handle.net/1814/46244> accessed 1 September 2019

Katznelson RD, 'Comments on the IEEE PatCom's proposal to accept LOAs under two distinct patent policies' (2018) available at <https://works.bepress.com/rkatznelson/86/download/> accessed on 1 September 2019

Katznelson RD, 'The IEEE controversial policy on Standard Essential Patents – the empirical record since adoption' (Symposium on Antitrust, Standard Essential Patents, and the Fallacy of the Anticommons Tragedy, Berkeley, CA, 2016) available <https://works.bepress.com/rkatznelson/80/download/> accessed 1 September 2019

Kumar A and Bhasin BS, 'Innovation and survival: lessons from the smartphone wars' available at <https://www.iam-media.com/innovation-and-survival-lessons-smartphone-wars> accessed on 1 September 2019

Lambert R and Temple P, 'The Relationship between Standards, Standards Development and Intellectual Property' (British Standards Institution) (2015) section 1.8, 17 available at <http://www.bsigroup.com/LocalFiles/en-GB/standards/BSI-Standards-and-IP-2015-UK-EN.pdf> accessed 1 September 2019

Lianos I, 'Some Reflections on the Question of the Goals of EU Competition Law' (2013) Centre for Law, Economics and Society, 1, 31 available at <http://dx.doi.org/10.2139/ssrn.2235875> accessed on 24/12/2018

Lundqvist Bjorn, 'Competition Law as the Limit to Standard-Setting' available at <https://ssrn.com/abstract=2551026> accessed on 1 September 2019

Macrotrends, 'Qualcomm Revenue 2006-2019' available at <https://www.macrotrends.net/stocks/charts/QCOM/qualcomm/revenue> accessed on 1 September 2019

McSweeney T, 'Holding the Line on Patent Holdup: Why Antitrust Enforcement Matters' (2018) 1, 4 available at https://www.ftc.gov/system/files/documents/public_statements/1350033/mcsweeney_-_the_reality_of_patent_hold-up_3-21-18.pdf accessed on 1 September 2019

Newman M and Crofts L, 'Alcatel-Lucent, Ericsson, Qualcomm's Challenge to IEEE Accreditation Fails' available at <https://mlexmarketinsight.com/insights-center/editors-picks/antitrust/north-america/alcatel-lucent,-ericsson,-qualcomms-challenge-to-ieee-accreditation-fails> accessed on 1 September 2019

NY Times, 'Fighters in a Patent War' (2012) 7 October 2012 <http://www.nytimes.com/interactive/2012/10/08/business/Fighters-in-a-Patent-War.html> accessed on 1 September 2019

Oberlander et al., 'The Smartphone Patent Wars' (2011) Financial Times, 17 October 2011, available at: www.ft.com/intl/cms/s/2/de24f970-f8d0-11e0-a5f7-00144feab49a.html#axzz45QxPM0iP accessed on 1 September 2019

Organisation for Economic Co-operation and Development (OECD), 'Licensing of IP Rights and Competition Law -Background Note by the Secretariat' (2019) DAF/COMP/WD(2019)62 available at [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/WD\(2019\)62&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/WD(2019)62&docLanguage=En) accessed on 1 September 2019

Organisation for Economic Co-operation and Development (OECD), 'Market Concentration: Issues paper by the Secretariat' (2018) DAF/COMP/WD(2018)46 3 available at [https://one.oecd.org/document/DAF/COMP/WD\(2018\)46/en/pdf](https://one.oecd.org/document/DAF/COMP/WD(2018)46/en/pdf) accessed 1 September 2019

Organisation for Economic Co-operation and Development (OECD), 'Regulatory Impact Analysis' (2009) 1, 12 available at <https://www.oecd-ilibrary.org/content/publication/9789264067110-en> accessed on 1 September 2019

Organisation for Economic Co-operation and Development (OECD), 'Licensing of IP Rights and Competition Law -Background Note by the Secretariat' (2019) DAF/COMP(2019)

SCTE Standards Bulletin, 'Fall 2003' available at http://www.scte.org/documents/standards/bulletin/SB_Fall_2003.htm accessed on 1 September 2019

Senden et al, 'Mapping Self- and Co-regulation Approaches in the EU Context' (European Economic and Social Committee, March, 2015) available at <http://www.eesc.europa.eu/?i=portal.en.self-and-co-regulation-literature.37834> accessed 1 September 2019

Sidak JG, 'Antitrust and the IEEE's Bylaw Amendments' (IEEE's 9th International Conference on Standardization and Innovation in Information Technology) available at <<https://www.criterioneconomics.com/antitrust-and-the-ieee-bylaw-amendments-2015-ieee-siit-speech.html>> accessed 1 September 2019

Silicon, 'Apple Loses Confidence in Intel's 5G Chip Deadline – Report' (2019) available at <https://www.silicon.co.uk/mobility/4g/apple-intel-5g-deadline-243589> accessed on 1 September 2019.

Strategy Analytics, 'Strategy Analytics: Huawei Takes 17 Percent Share of Global Smartphone Market in Q2 2019' (2019) available at <https://news.strategyanalytics.com/press-release/devices/strategy-analytics-huawei-takes-17-percent-share-global-smartphone-market-q2-2> accessed on 1 September 2019

Stratfor, 'Qualcomm Ends Its Fight With Apple, but an Antitrust Threat Still Looms' (2019) available at <https://worldview.stratfor.com/article/qualcomm-ends-legal-disputes-apple-china-threat-still-looms> accessed on 1 September 2019

Taschdjian M and Alleman J, 'Antitrust Failures: The Internet Giants' (International Telecommunications Society (ITS) 2018) 1, 9 available at <http://hdl.handle.net/10419/184969> accessed 1 September 2019

Teece DJ and Sherry EF, 'The IEEE's New IPR Policy: Did the IEEE Shoot Itself in the Foot and Harm Innovation' (2016) <http://businessinnovation.berkeley.edu/wp-content/uploads/2014/07/14-The-IEEES-New-Policy_Teece_Sherry_8-3-16_2_Clean.pdf> accessed 1 September 2019

The CEN and CENELEC Workshop, 'Core Principles and Approaches for Licensing of Standard - CWA 95000' (2019) available at ftp://ftp.cen-cenelec.eu/EN/News/WS/2019/CWA_SEP/CWA95000.pdf accessed on 1 September 2019

The Competition Directorate–General of the European Commission, 'Competition Policy Brief: Standard-Essential Patents' available at http://ec.europa.eu/competition/publications/cpb/2014/008_en.pdf accessed 1 September 2019

The New York Times, 'Apple and Qualcomm Settle All Disputes Worldwide' (2019) available at <https://www.nytimes.com/2019/04/16/technology/apple-qualcomm-settle.html> accessed on 1 September 2019.

Toffaletti S, 'European SMEs and Standards | ASTM Standardization News' (2019) available at <https://www.astm.org/standardization-news/?q=first-person/european-smes-and-standards-ma16.html> accessed 1 September 2019

Vestager M, 'Protecting consumers from exploitation', Chillin' Competition Conference, Brussels, 21 November 2016 available at https://ec.europa.eu/commission/commissioners/2014-2019/vestager/announcements/protecting-consumers-exploitation_en

VITA, 'VSO Policies and Procedures', (2015) 1, 11 para 10.3.2 available at <https://www.vita.com/resources/Documents/Policies/vso-pp-r2d8.pdf> accessed on 1 September 2019

Weissberger A, '5G Patent Licensing Wars Begin: Nokia undercuts Ericsson and Qualcomm on royalties for 5G smartphones' (2018) <<http://techblog.com-soc.org/2018/08/22/5g-patent-licensing-wars-begin-nokia-undercuts-ericsson-and-qualcomm-on-royalties-for-5g-smartphones/>> accessed 21/12/2018

Wienstroth H and Herrmann N, 'EU: IP & Antitrust' (Global Competition Review, 2016) available <<http://globalcompetitionreview.com/benchmarking/the-european-middle-eastern-and-african-antitrust-review-2017/1067817/eu-ip-anti-trust>> accessed on 1 September 2019

Willingmyre G, 'History of the Patent Policy of the American National Standards Institute' available at <<https://papers.ssrn.com/abstract=2451165>> accessed on 1 September 2019

Zingales N, 'The Legal Framework for SEP Disputes in EU Post-Huawei: Whither Harmonization?' (2017) 1, 21 available at <https://papers.ssrn.com/abstract=3017102> accessed on 1 September 2019