

Standards Development Organizations, Intellectual Property, and Standardization: Fundamentals and Recent Proposals

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INTRODUCTION

Standards development and intellectual property are cornerstones of the modern, digital economy and commerce. Many businesses rely on a variety of standards and intellectual property, and many products can be brought to market because of standards and continued innovation. As individuals, our day-to-day routine relies on 4G or 5G on our smartphones to communicate, Wi-Fi to receive and send information on our devices, and Bluetooth to connect AirPods to the various pieces of technology we own. Many of these products incorporate technologies based on standards that read on patented inventions. Because of these standards, our smartphones are able to connect with various types of wireless audio devices. Our smartphones, laptops, tablets, TVs, and even refrigerators and washing machines, can connect to the internet wirelessly through a Wi-Fi router. Our smartphones, regardless of the brand or the manufacturer, can connect to the cellular network. These standards came about through the work of Standard Development Organizations (“SDOs”), where patent owners and patent implementers collaborate as members of the SDOs to develop common standards for the different technological functions.¹ The collaborators review, discuss, and vote on which set of codes, inventions, and protocols are adopted into the standard.

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¹ SDOs are also referred to as Standard Setting Organizations (“SSOs”). For the purposes of this article, they are interchangeable.

Yet standards and intellectual property rights have been one of the most hotly debated and litigated topics in the last couple decades. Some cases involving alleged deception in the standard development process focused on an SDO participant failing to disclose patented innovations that were later incorporated into the standard, which caused the industry to become locked-in to the use of those technologies, and the patent owner collected substantial royalties from the manufacturers that practiced the standard. Other cases involve manufacturers and patent owners, that disagree on what Fair, Reasonable and Non-Discriminatory (“FRAND”) royalties should be for a patent that has been incorporated into an SDO’s standard. Finally, when it comes to the vast and complex digital economy of the modern age, there are many critical questions – many of which lack good answers – that relate to standards. In particular, do mandated open systems of standards and interoperability facilitate or deter innovation and competition?

This chapter begins with a primer on SDOs in Section I, followed by a review of the competition policy debate on SDOs and intellectual property rights in Section II. In Section III, I summarize some of the recent proposals that relate to standards and interoperability and offer my thoughts on those proposals.

I. ECONOMICS OF STANDARDIZATION, STANDARD DEVELOPMENT ORGANIZATIONS, AND STANDARD DEVELOPMENT PROCESSES

A. Background on SDOs, Membership, and Processes

SDOs are organizations in which patent holders and adopters participate voluntarily, to discuss and determine, through consensus, the technical aspects of standards. SDOs serve as a forum where industry participants perform collaborative research and discuss the merits of alternative technologies. Patent holders contribute their knowledge and technology, whereas adopters, also known as implementers, give their knowledge and input from the implementation perspective. The goal is to identify the best available solution to a given technical problem when there are gains from

coordinating on a common design. At the end of the process for a particular standard, an SDO chooses a particular technology to incorporate into the standard and issues a formal endorsement. This adoption by the SDO signals the end of deliberations and promotes industry-wide investments in the new technology.

SDOs have long been crucial to our innovation-driven economy, although their role has intensified over the last few decades as technology becomes a greater part of modern life and the economy. SDOs develop, support, and set interoperability and performance standards, which help to facilitate the adoption of new technologies.² The participating patent holders can be individuals, or individuals representing firms and other organizations including academic institutions that own patents. The firms and organizations that participate in SDOs are typically of varying sizes, large and small, and some contribute intellectual property rights (“IPRs”), while others adopt and implement the technology. Some have found that standards development is conducted primarily by personnel employed by firms active in relevant product markets. For example, studies found that several large firms in the computing, semiconductor, and electronics industries were actively engaged in 50 or more different SDOs.³

When developing standards, SDOs typically require their members to disclose the intellectual property rights they own and ask for a commitment to a FRAND royalty rate for a license to any IPRs the members contribute that become standard essential.⁴ Working groups within SDOs then review and evaluate the various contributed

² See, e.g., U.S. DEP’T OF JUSTICE & FED. TRADE COMM’N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 33 (2007), <http://www.ftc.gov/sites/default/files/documents/reports/antitrust-enforcement-and-intellectual-property-rights-promoting-innovation-and-competition-report.s.department-justice-and-federal-trade-commission/p040101promotinginnovationandcompetitionrpt0704.pdf>.

³ Justus Baron & Daniel F. Spulber, *Technology Standards and Standard Setting Organizations: Introduction to the Searle Center Database*, 27 J. OF ECON. & MGMT. STRATEGY 462 (2018).

⁴ James Ratliff & Daniel Rubinfeld, *The Use and Threat of Injunctions in the RAND Context*, 9 J. OF COMPETITION L. & ECON. 1 (2012).

technologies and, through many discussions among engineers and technical experts, determine the best technology or sets of technologies for the standard. IPRs deemed essential to a standard by the working groups are known as Standard Essential Patents (SEPs). SDOs' member firms compete vigorously for inclusion into the standard during the evaluation process, in part because owners of SEPs expect to earn a steady revenue stream from licensing their IPRs to firms that manufacture products that incorporate the standard.

SDOs vary significantly in terms of size and span a variety of industry and technical categories, including aeronautics, artificial intelligence, automotive, life sciences, wireless and mobile, electronics, and many others.⁵ As of July 2020, there are 1,120 SDOs around the world. Some SDOs are focused on one industry, while others cover multiple industries. For example, the International Telecommunication Union, Telecommunication Standardization Sector ("ITU-T") is one of the oldest and largest SDOs. It covers standards solely in the telecommunications industry and has issued more than 4,700 standards. American National Standards Institute ("ANSI") and Institute of Electrical and Electronics Engineers ("IEEE"), on the other hand, cover multiple industries, each with thousands of members and standards.⁶

B. Benefits and Costs of Standards

Standards can make products more valuable for consumers and less costly for firms to produce.⁷ Interoperability standards, for example, ensure that products manufactured by different companies are compatible with one another and can also

⁵ For a list of SDOs and standards in a variety of fields, see *Standard Setting Organizations and Standards List* (last visited Aug. 15, 2020), <http://www.consortiuminfo.org/links/>.

⁶ Baron & Spulber, *supra* note 3 (using membership data from 195 different SDOs, Baron and Spulber found that the median SDO during the period studied had 114 members, and only five SDOs had membership levels greater than 1,000.)

⁷ See, e.g., U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, *supra* note 2, at 33.

reduce companies' costs of production by making it less costly for them to acquire technical information and simplify product design. For consumers, standards facilitate interoperability from a wide adoption of the standards, which in turn can help to protect consumers from stranding and result in greater realization of network effects.⁸ Consumer benefits from product compatibility are particularly large for network industries, where the value of a product or service to an individual consumer increases as the number of consumers that adopt compatible products rises.⁹

SDOs are not the only way by which standards are set. Standards also may be set through competition in the marketplace whereby firms compete vigorously in a "standards war," and the market eventually tips toward a single product that then becomes the *de facto* standard for an industry.¹⁰ One classic example is the competition between VHS and Beta before the market tipped toward VHS in the 1980s. Instead of a standard that was discussed and determined early on, VHS and Beta competed in the marketplace and, in a sense, the consumers helped to choose what became the standard for the industry based on their preferences and experience with the products.

Either way, firms compete against one another for their technologies to become the standard. The difference is not whether competition takes place but rather where that competition takes place—through an SDO's standard development process or in the

⁸ Consumers can be stranded if the technology they invested in becomes obsolete and/or unsupported when another technology "wins" in a standards war through competition in the marketplace. This means they may not have necessary after sales support, and/or no complementary goods to keep their technology current and enjoyable. See, e.g., Bruce H. Kobayashi & Joshua D. Wright, *Intellectual Property and Standard Setting*, in ABA HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARDS SETTING 95 (2010); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, 1 INNOVATION POL'Y & ECON. 119 (Adam B. Jaffe, Josh Lerner & Scott Stern eds., 2001).

⁹ *Id.*

¹⁰ See, e.g., U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, *supra* note 7, at 34; Michael L. Katz & Carl Shapiro, *Systems Competition and Network Effects*, 8 J. ECON. PERSP. 93, 107-08 (1994); Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 CALIF. L. REV. 1889, 1899 (2002); Shapiro, *supra* note 8, at 137-38. It is also possible the market does not tip toward a single product, and multiple, incompatible products prevail in the marketplace.

marketplace. Of course, the standards that would emerge through one versus another mechanism may be different, and thus can have different consequences on efficiency and consumer welfare.

An initial industry-wide standard can have significant benefits, including a higher success rate of launching a new network and introducing important technologies to the marketplace, greater realization of network effects, increasing protection afforded to buyers from being stranded, and enabling competition within the standard.¹¹ A standard set by SDOs also avoids a standards war, where firms may have to incur significant costs in order to establish an installed base of users. Consumers may also delay purchasing until the *de facto* standard is established to avoid the costs of choosing a losing standard.¹²

The positive network externalities of standards in network industries are widely recognized. For example, in its recent report on competition policy for the digital era, the European Commission (“EC”) notes that new technologies of information are often subject to network externalities, where “the usefulness for each user of using a technology or a service increases as the number of users increases.”¹³ This is true for large social platforms, where the larger the platform, the more users will be able to find the person they want to interact with on the platform, but also for others, such as communication standards.¹⁴

There can also be costs associated with standards. SDO-set standards may impose

¹¹ See, e.g., Marc Rysman & Timothy Simcoe, *Patents and the Performance of Voluntary Standard-Setting Organizations*, 54 MGMT. SCI. 1920 (2008); Shapiro, *supra* note 8, at 138.

¹² See, e.g., Jeffrey Church & Roger Ware, *Network Industries, Intellectual Property Rights and Competition Policy*, in COMPETITION POLICY AND INTELLECTUAL PROPERTY RIGHTS IN THE KNOWLEDGE-BASED ECONOMY 230 (Robert D. Anderson & Nancy T. Gallini eds., 1998).

¹³ DIRECTORATE-GENERAL FOR COMPETITION, EUR. COMM’N, COMPETITION POLICY FOR THE DIGITAL ERA (2019) [hereinafter EC REPORT], <https://ec.europa.eu/competition/publications/reports/kd0419345enn.pdf>.

¹⁴ See, e.g., John M. Yun, *Overview of Network Effects and Platforms*, in THE GAI REPORT ON THE DIGITAL ECONOMY (2020); and Christopher Yoo, *Network Effects in Action*, in THE GAI REPORT ON THE DIGITAL ECONOMY (2020).

costs on consumers by reducing *ex ante* competition and consumer choice, and by promoting proprietary control over a closed standard.¹⁵ In the absence of property rights to standards, for example, the adoption of uniform standards may create incentives for free riding and suppress incentives for firms to improve on the current standard or create alternative standards.¹⁶ Moreover, a standard that is adopted too early in the development of a type of technology may snuff out other inventions that offer the same functionality but are superior. Adopting a standard too early may discourage competition between different inventors and suppress other innovations. Critical to the tradeoffs inherent between SDO and *de facto* standards, and to their respective effects upon competition and consumer welfare, are incentives to participate in the SDO process and, in turn, SDO contracting and IPR policies.

C. Contractual Commitments with the SDOs

There is modest but growing literature on SDOs and their IPR policies, including a small number of empirical examinations of SDOs' contract terms. Lemley (2002) offers an early and comprehensive study of SDOs and their contract terms, concluding that SDO IPR policies fundamentally change the way in which IPRs are used in practice and provide incentives to develop and commercialize IPRs in different industries.¹⁷ Lemley emphasizes the significant diversity among SDO IPR policies and examines how antitrust rules can restrict SDOs from engaging in some important procompetitive activities.

SDO IPR policies exhibit rich variation across a number of dimensions. The heterogeneity could suggest the contract terms respond and adapt to changes in the

¹⁵ Shapiro, *supra* note 8.

¹⁶ See, e.g., Luis Cabral & David Salant, *Evolving Technologies and Standards Regulation* (2014), 36 INT'L J. INDUS. ORG. 48 (2014); Kobayashi & Wright, *supra* note 8. See generally STAN J. LIEBOWITZ & STEPHEN E. MARGOLIS, WINNERS, LOSERS & MICROSOFT: COMPETITION AND ANTITRUST IN HIGH TECHNOLOGY (1999) (discussing standards competition).

¹⁷ Lemley, *supra* note 10.

competitive environment and to the specific needs of each SDO to design, incorporate, and attract the IPRs that yield the best standard for the organization. Although some SDOs have no policies at all, others have well-developed IPR policies.¹⁸ For those SDOs with IPR policies, SDO rules governing the scope of disclosure, licensing arrangements, and whether members' ownership of IPRs within a standard is prohibited, all vary considerably.

Some SDOs require royalty-free licensing before incorporating the IP into a standard, while others require "reasonable and nondiscriminatory licensing."¹⁹ Other SDOs specifically compel members to license worldwide to everyone using the standard, not just to other members of the SDO. Certain SDOs provide guidance upon the meaning of "reasonable" and specify a mechanism for dispute resolution, while others do not. The FRAND commitment itself can also take a variety of forms—it may be implicit from the patentees' participation in a standard development process (per the SDOs' bylaws), or it may be an explicit written acknowledgement of such obligations to the SDOs.²⁰ SDOs may require an IPR holder to make a uniform and specified FRAND assurance, or may allow the IPR holder the freedom to express its willingness to license on its own terms. For example, IEEE considers the letters of assurance from four different owners of SEPs for the Wi-Fi standard. One patent holder promises that the technology "will be made available at nominal costs to all who seek to use it for compliance with an incorporated standard," while another agrees to license on a "non-discriminatory basis and on

¹⁸ See, e.g., U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, *supra* note 7, at 47; Benjamin Chiao, Josh Lerner & Jean Tirole, *The Rules of Standard-Setting Organizations: An Empirical Analysis*, 38 RAND J. ECON. 905, 916-18 (2007); Lemley, *supra* note 10, at 1904-6, 1973-1980; Joanna Tsai & Joshua Wright, *Standard Setting, Intellectual Property Rights, and the Role of Antitrust in Regulating Incomplete Contracts*, 80 ANTITRUST L. J. 157 (2015).

¹⁹ See, e.g., U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, *supra* note 7, at 47; Chiao et al., *supra* note 18; Lemley, *supra* note 10, at 1904-06, 1973-80.

²⁰ See James Ratliff & Daniel L. Rubinfeld, *The Use and Threat of Injunctions in the RAND Context*, 9 J. COMP. L. & ECON. 1, 10-11 (2013).

reasonable terms including its then current royalty rates.”²¹ A third patent holder provides no benchmark at all to roughly estimate the royalty rates it would charge. In short, SDO contract terms exhibit remarkable heterogeneity quite consistent with the variation in market forces faced by their remarkably varied members and associated technologies.

Lerner and Tirole (2006) address the question of how firms choose between competing SDOs.²² They introduce competition between SDOs and IPR policies in that competition. Specifically, Lerner and Tirole demonstrate the incentives for forum shopping technology contributors to respond to “sponsor friendly,” and less rigid, IPR policies, resulting in higher quality standards. Chiao, Lerner and Tirole (2007) test these predictions by examining SDO IPR policies and find that user-friendliness is positively correlated with concessions. They also show that royalty-free licensing tends to be associated with no disclosure requirements, while RAND licenses are associated with disclosure requirements.

Layne-Farrar (2013) assesses the changes of SDOs’ IPR policies over time in response to antitrust enforcement policy changes and enforcement actions.²³ Layne-Farrar illustrates that most SDOs have responded specifically to changes in the risk of antitrust exposure by altering their IPR policies. In fact, she found several examples of proactive policy changes to prevent certain risks from materializing and many examples of reactive but still timely changes. Only a handful of SDOs fail to keep pace with the evolution of antitrust concerns. Layne-Farrar concludes that this suggests that “heavy-handed” interventions are unwarranted, but safe harbor guidelines from competition

²¹ *Id.* (citing Kamilo Feher, Dir. Digital Commc’ns Research Laboratory, Univ. of Cal., Davis, Notice of Patent Applicability (Sept. 20, 1993, rev. June 29, 1994), <http://goo.gl/F0djs>; Letter from Walter L. Willigan, Program Dir., Licensing, IBM, to Vic Hayes, Chairman, IEEE P802.11 (Oct. 10, 1995), <http://goo.gl/ioCp4>).

²² Josh Lerner & Jean Tirole, *A Model of Forum Shopping*, 96 AM. ECON. REV. 1091 (2006).

²³ Anne Layne-Farrar, *Proactive or Reactive? An Empirical Assessment of IPR Policy Revisions in the Wake of Antitrust Actions*, 59 ANTITRUST BULL. 37 (2014).

agencies in key jurisdictions may be helpful, provided that the guidelines provide sufficient flexibility to be workable across a diverse set of organizations.

Finally, Tsai and Wright (2015) find that SDOs have proven to be dynamic institutions, and that in response to threats of patent holdup, many have adopted and modified a number of contractual provisions to reduce the occurrence.²⁴ In particular, SDOs' contractual innovations to mitigate holdup include patent disclosure rules and IPR licensing terms such as the FRAND commitment. Moreover, rather than inefficiently incomplete, Tsai and Wright find that SDO contracts are an efficient outcome reflecting the costs and benefits of adding greater specificity to SDO contracts.

D. SDOs as a Platform

The significant variation in IPR policies for SDOs IPR that now exist is what one expects to see with competitive contracting in a diverse ecosystem of technologies and SDOs.²⁵ The diversity in contract terms also reflects the many different ways SDOs seek to attract valuable technology contributors as well as adopters to their standards. Although some technology companies join more than one SDO, complying with differing disclosure rules and other policies in different SDOs can be very costly to companies with IPRs, especially for those with large patent portfolios.²⁶

Competition to attract contributors does not imply SDOs would always craft IPR policies that favor contributing members, possibly leading to a higher probability of hold-up, in which a patent holder exercises its right to exclude the use of its invention unless a higher royalty rate is agreed upon. SDOs are also constrained to have policies that are attractive to adopter members and, all else equal, an SDO is more attractive to technology

²⁴ Tsai & Wright, *supra* note 18, at 158.

²⁵ See, e.g., Michael J. Schallop, *The IPR Paradox: Leveraging Intellectual Property Rights to Encourage Interoperability in the Network Computing Age*, 28 AIPLA Q.J. 195, 234 (2000) (suggesting that the variance in IP policies creates a sort of competition, with the most efficient IP rule likely to prevail).

²⁶ U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, *supra* note 7, at 43; Lemley, *supra* note 10, at 1907.

contributors with a larger base of adopters. Similarly, while an SDO with a larger base of adopters is more attractive to technology contributors, it would not attract technology contributors if its IPR policies overwhelmingly favor adopters.

SDOs thus have the features of a two-sided market, where they serve as platforms to join together contributors and adopters. As a platform, a successful SDO needs to attract members on both sides of the platform, by striking a balance for the two sides with respect to their rules and policies. The contract terms optimizing this balance will vary between and within SDOs as technological, regulatory, and market conditions facing the organization change over time.

II. COMPETITION POLICY AND SDO IPR POLICY DEBATE

Despite the benefits of standards, voluntary consensus standards issued by SDOs have become the subject of much controversy, including policy debate, regulatory enforcement, and private litigation. Much of the controversy centers upon the standards that read on patents, the potentially abusive enforcement of such IPRs against manufacturers and other users of products that incorporate such standards, and the terms on which patent holders license the use of those patents.

A. The Role of Patents and SDOs in Innovation and Competition

Patents and the granting of IPRs encourage innovation because it awards enforceable rights to the inventor and allows the invention to be widely adopted by others who can then build upon the invention. The application of intellectual property to standards can be beneficial for the same reasons that intellectual property is generally beneficial.²⁷ The IPRs provide incentives for firms to invest in the production of standards

²⁷ For more on the incentives created by granting IPRs, see Greg Werden, Luke Froeb, Bernhard Ganglmair & Steven Tschantz, *Technology Economics: Innovation, Licensing, and Antitrust*, in THE GAI REPORT ON THE DIGITAL ECONOMY (2020); and Richard A. Epstein, *Toward the Peaceful Coexistence of Patent and Antitrust Law*, in THE GAI REPORT ON THE DIGITAL ECONOMY (2020).

and can facilitate the licensing of IPRs as standards are adopted. Patents disclosed to SDOs are cited much more frequently and for a longer period of time than other patents, which suggests that allowing IPRs in standards plays an important role in introducing important technologies into the marketplace.²⁸ The absence of IPRs in standards can lead to the underproduction of standards. Moreover, precluding the use of IPRs in the standard development process may deter investment into research and development and reduce the quality of the final product.

That said, the inclusion of IPRs in standards can create the potential for significant market power. The adoption of a standard often requires specific investment, which can in turn leave those who have adopted the standards without feasible alternatives. If a standard becomes successful and is widely adopted, a firm that owns IPRs that are incorporated into the standard may possess significant market power. Thus, while including IPRs in standards can increase the value of the standard to consumers, standards with IPRs can also present significant risks.

Indeed, there are several articulated concerns over the use of IPRs in standards development.²⁹ An articulated concern is patent ambush, where a patent holder can fail to disclose a patent during the development of a standard, and once that patent has been incorporated and becomes essential, the patent holder may be able to “ambush” implementers of the standard.³⁰ Once implementers have made standard-specific

²⁸ Marc Rysman & Timothy Simcoe, *Patents and the Performance of Voluntary Standard-Setting Organizations*, MGMT. SCI. 1920-34 (2008) (“Our main results show that . . . citations increase substantially following standardization. These results suggest that SSOs identify promising technologies and influence their subsequent adoption.”).

²⁹ See, e.g., Layne-Farrar, *supra* note 23; Kobayashi & Wright, *supra* note 8.

³⁰ A couple of well-known cases brought by the FTC spurred the SDO patent ambush debate, including Complaint, *Dell Computer Corporation*, No. C-3658, 121 F.T.C. 616 (1996). The SDO implicated was VESA (Video Electronics Standards Association). Another is Complaint, *Rambus Inc.*, No. 9302 (June 19, 2002). The SDO implicated was JEDEC (Joint Electron Device Engineering Council), which promulgates standards for the memory chip market, DRAM in particular.

investments, they are locked-in and are subject to a “patent hold-up” because they would have no alternative but to pay patent holders what they demand. Two well-known cases brought by the Federal Trade Commission (FTC) that spurred the SDO patent ambush debate include the FTC’s Administrative Complaint *In the Matter of Dell Computer Corporation* in 1995,³¹ and *In the Matter of Rambus* in 2002.³²

Another articulated concern is over the breach of FRAND licensing commitments, where firms with essential patents (SEP holders) may attempt to charge above-FRAND rates after the patents have been incorporated into the standard, or the patent owner may attempt to seek an injunction against any licensees with whom the owner is not able to reach an agreement on royalty rates. On breach of the FRAND commitment, the allegation is that patent holders may renege on their FRAND commitments after their patents are included in a standard and SDO members have made standard-specific investments in implementing the standard, exploiting *ex post* opportunism. One of the earliest cases was *Broadcom v. Qualcomm* in 2005, in a dispute that spanned several jurisdictions.³³ The main allegations were that Qualcomm charged discriminatory royalties and collected double royalties. In *European Commission v. Qualcomm*, the EC initiated proceedings against Qualcomm, alleging that Qualcomm’s licensing terms and conditions were not FRAND.³⁴ More recently, in 2017, the FTC brought a case against Qualcomm for violating Qualcomm’s FRAND commitments. In particular, the FTC alleged that Qualcomm excluded competitors and harmed competition through policies

³¹ See Complaint, *Dell Computer Corporation*, No. C-3658, 121 F.T.C. 616 (1996); Decision and Order, *Dell Computer Corporation*, No. C-3658, 121 F.T.C. 618 (1996).

³² For a case summary and a list of the filings on this matter, see *In the matter of Rambus Inc.*, FED. TRADE COMM’N (last updated May 14, 2009), <http://www.ftc.gov/os/adjpro/d9302/index.shtm>.

³³ See Press Release, Broadcom Corporation, Broadcom Charges Qualcomm with Violating U.S. Antitrust Laws (July 5, 2005), <http://www.broadcom.com/press/release.php?id=726224&source=home>.

³⁴ See Press Release, European Commission, Antitrust: Commission Initiates Formal Proceedings Against Qualcomm, (Oct. 1, 2007), http://europa.eu/rapid/pressrelease_MEMO-07-389_en.htm.

that required customers to accept elevated royalties when using competitors' processors, refused to license its cellular SEPs to its competitors, and entered into exclusive dealing arrangements with Apple, among others.³⁵ In August 2020, the Ninth Circuit Court of Appeals vacated the District Court's judgment, and reversed the District Court's permanent, worldwide injunction in *FTC v. Qualcomm*, which prohibited several of Qualcomm's business practices. In particular, the Ninth Circuit held that Qualcomm does not have an antitrust duty to license its SEPs to its direct competitors in the modern chip markets, because none of the required elements for the *Aspen Skiing* exception were present. Moreover, to the extent Qualcomm breached any of its FRAND commitments, the remedy for such a breach was in contract or tort law, because the Court was not convinced that Qualcomm's alleged breach of its contractual commitment impaired the opportunities of rivals. Finally, the court concluded that royalties and the "no license, no chips" policy did not impose an anticompetitive surcharge on rivals' modem chip sales.³⁶ In September 2020, a district court in Texas declined to adopt the Broadcom framework in *Continental v. Avanci*, dismissing a claim based on allegedly fraudulent FRAND declarations.³⁷ Clearly, the laws on the breach of a FRAND licensing agreement as it pertains to antitrust claims have continued to develop.

On injunctive relief, the debate focuses on whether the SEP holder should have access to any form of injunctive relief. In particular, does promising to license a SEP on FRAND terms to any licensee preclude the SEP holder from seeking an injunction? On the one hand, by making a FRAND commitment the SEP holder has indicated that it is committed to grant a license to the patent, and that monetary compensation is sufficient.³⁸

³⁵ See Complaint, Fed. Trade Comm'n v. Qualcomm Inc., No. 5:17-cv-00220-LHK (Feb. 1, 2017), https://www.ftc.gov/system/files/documents/cases/0038_2017_02_01_redacted_complaint_per_court_order_dkt.pdf.

³⁶ See Fed. Trade Comm'n v. Qualcomm Inc., 969 F.3d 974, 1005 (9th Cir. 2020).

³⁷ Cont'l Auto. Sys., Inc. v. Avanci, LLC, No. 3:19-CV-02933-M, 2020 WL 5627224 (N.D. Tex. Sept. 10, 2020).

³⁸ Joseph Farrell, John Hayes, Carl Shapiro & Theresa Sullivan, *Standard-Setting, Patents and Hold-Up*, 74

On the other hand, a blanket rule against even seeking an injunction after negotiations were attempted would amount to compulsory licensing for SEPs and would place SEP holders at a significant bargaining disadvantage. Moreover, SEP holders would be subject to “patent hold-out,” in which they would have no relief if implementers refuse to pay a rightful reward to the SEP holders unless SEP holders bring a costly litigation.

B. The Department of Justice’s (DOJ) New 2019 Policy Statement on SEPs Subject to Voluntary FRAND Requirements

In the last year, the DOJ withdrew the joint statement issued by the Department of Justice and the U.S. Patent and Trademark Office (PTO) in early 2013, entitled “Policy statement on Remedies for Standards-Essential Patents Subject to Voluntary F/RAND Commitments.” In its place, the DOJ, PTO, and the National Institute of Standards and Technology (NIST) issued a new joint policy statement at the end of 2019.³⁹ In a speech at the Advanced Patent Law Institute, Assistant Attorney General Makan Delrahim addressed the reasons to protect the patent holder’s right to seek an injunction against infringement of its technology, even when the patent is essential to the practice of a standard.⁴⁰ Moreover, he stressed the importance of how SDOs can affect incentives to innovate when they set patent policies that govern participation in the forum.

In particular, in the AAG’s view, there has been a shift toward the view that patents might confer too much power, particularly if those patents are essential to a technical interoperability standard. The fundamental right of the patent holder to exclude

ANTITRUST L. J. 603 (2007); Lemley, *supra* note 10; Joseph Miller, *Standard Setting, Patents, and Access Lock-in: RAND Licensing and the Theory of the Firm*, 40 IND. L. REV. 351 (2007).

³⁹ U.S. Patent & Trademark Office, Nat’l Inst. of Standards and Tech. & U.S. Dep’t of Justice, Policy Statement on Remedies for Standards-Essential Patents Subject to Voluntary F/Rand Commitments (Dec. 19, 2019), <https://www.justice.gov/atr/page/file/1228016/download>.

⁴⁰ Makan Delrahim, Assistant Att’y Gen. for Antitrust Division, U.S. Dep’t of Justice, Remarks at the 19th Annual Berkeley-Stanford Advanced Patent Law Institute: “Telegraph Road”: Incentivizing Innovation at the Intersection of Patent and Antitrust Law (Dec. 7, 2018), <https://www.justice.gov/opa/speech/assistant-attorney-general-makan-delrahim-delivers-remarks-19th-annual-berkeley-stanford>.

competitors has been questioned in this context. Even with a FRAND commitment, the test for obtaining injunctive relief against infringement is balancing incentives to innovate and benefits to the public. The relevant questions should be, what will optimize the incentive to innovate for the benefit of the public? What would be the effect of disfavoring an injunction in the case of FRAND encumbered patents? Since injunctions against infringement frequently *do* serve the public interest in maintaining a patent system that incentivizes and rewards successful inventors through the process of dynamic competition, enforcement agencies without clear direction otherwise from Congress should not place a thumb on the scale against an injunction in the case of FRAND-encumbered patents.

Moreover, discussion regarding injunctive relief should include the recognition that in addition to patent holders being able to engage in patent hold-up, patent implementers can also engage in patent hold-out, once innovators have already sunk their investment into development of valuable technology, and that both of these possibilities ought to be considered. A balanced discussion should recognize that SDOs may make it too easy for patent implementers to bargain collectively and achieve sub-optimal concessions from patent holders that undermine the incentive to innovate. There is a monopoly versus monopsony problem – a group of manufacturers within an SDO can come together to dictate licensing terms to a patent holder as a condition for inclusion in a standard, exercising collective monopsony power over the patent holder.

Finally, SDOs can and do affect incentives to innovate when they set patent policies that govern participation in the forum. If an SDO's policy is too restrictive for one side or another, it risks deterring participation in pro-competitive standard development. There is no special set of rules for exclusion when patents are part of standards. A FRAND commitment does not, and should not, create a compulsory licensing scheme. The supplemental IEEE business review letter that the DOJ recently issued also reiterates these points. In addition, the letter specifically raises the concern that IEEE's IP policy

might discourage participation in the SDO process.⁴¹

III. RECENT POLICY PROPOSALS RELATED TO STANDARDS

There have been a few recent policy proposals that relate to standards, in particular systems of open standards, protocol and data interoperability, and mandated data sharing. This section reviews those proposals and discusses them in turn from an economic perspective and in the context of the economics of standardization.

A. Proposals on Open Standards for Data and Personal Data Mobility

In a recent report on digital competition, Professor Jason Furman and others propose that a digital markets unit be charged with “enabling greater personal data mobility and systems with open standards.”⁴² Among other things, the Furman Report advocates that there are significant benefits to systems with open standards, which are built using technical specifications that are agreed in common and freely available for implementation. The open standards can thus enable interoperability and compatibility across markets.⁴³

Moreover, the Furman Report indicates that open standards are developed via processes that are transparent and open to broad participation from industry. But the

⁴¹ See Letter from Assistant Attorney General Makan Delrahim to Sophia A. Muirhead, General Counsel and Chief Complaint Officer for Institute of Electrical and Electronics Engineers, Inc. (Sept. 10, 2020), <https://www.justice.gov/atr/page/file/1315291/download>.

⁴² DIGITAL COMPETITION EXPERT PANEL, UNLOCKING DIGITAL COMPETITION: REPORT OF THE DIGITAL COMPETITION EXPERT PANEL 5 (2019) [hereinafter FURMAN REPORT], https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf (“Second, the digital markets unit would be charged with enabling greater personal data mobility and systems with open standards where those tools will increase competition and consumer choice.”).

⁴³ *Id.* at 71-72 (“Systems built using open standards are commonly referred to as those that were built using technical specifications that are agreed in common and freely available. Open standards are building blocks that enable interoperability, compatibility and consistency across markets. Open standards are publicly available and developed via processes that are transparent and open to broad participation from industry.”).

Furman Report notes that there are several obstacles to interoperability. The obstacles can be technical, due to a lack of coordination, and/or misaligned incentives between dominant companies versus the greater good.⁴⁴ The Report proposes that systems be built on open standards, so that the entire service is compatible with that offered by other third parties, and asserts that requiring systems be built on open standards can support ecosystems where competition and innovation can thrive. For example, the Report notes, innovators can build new solutions that compete directly with existing ones, or innovators can build ancillary services based on existing systems, bringing a host of new opportunities for businesses.

While there are indeed significant benefits from standards and interoperability, as we discussed in Section I, there are significant dangers with open standards and conferring the power to a digital markets unit to establish the systems of open standards. Open standards can very much be at odds with innovation and competition, for several important reasons.

First, although standards enable innovators to build upon existing inventions in a compatible manner, standards can also inhibit innovators from building inventions that could potentially be bigger and better outside of the prevailing standard. If the standards that already exist are the only standards that can be practiced, then inertia would inhibit breakthrough innovations.

Imagine if we were not allowed to have both iOS and Android systems, because whichever system came first in the eyes of the digital markets unit became the standard and Google or Apple either had to scrap the operating system it had in mind or try to build on top of the infrastructure of the other. This is likely to diminish the strengths and benefits of the system. Without the type of digital markets unit that the Furman Report contemplates to impose a rigid path leading to one standard that was available at one

⁴⁴ *Id.* at 71-75.

point in time, both iOS and Android were developed and entered to compete in the marketplace. Consumers have choices when it comes to mobile devices. While the two operating systems learn from each other in terms of the features that consumers desire, they also compete vigorously with each other. Given that there are substantial followings for both, both systems are successes, with millions of users that find one or the other more beneficial.

The parallel existence of Apple's iOS and Google's Android is an example of how a (current) regime without the interference of a digital markets unit resulted in more innovation and more competition, not less. The marketplace has two mobile operating systems to choose from, and the two systems surely resulted in more competition than there would have been with just one government- sanctioned system. Not only do the two systems offer consumers choices, they also allowed different business models to emerge. Apple's iOS only operates on Apple devices, while Android works with a number of original equipment manufacturers (OEMs), including Samsung, HTC, Motorola, and others. As a result, Android devices are not uniform as Apple devices are, and OEMs further compete on functionality such as camera, screen, and other features to gain consumer sales. In other words, the current environment allowed both intra-system competition (among OEM suppliers), as well as inter-system competition, between iOS and Android. What the digital market units would have done, in choosing a "winner" early on for the sake of interoperability, could have suffocated systems that millions of Americans prefer in their infancy.⁴⁵ Although iOS and Android are the largest mobile operating systems today, they are not the only ones nor were they the first. Before iOS and Android, we had Windows Mobile (first released by Microsoft in 2000), and

⁴⁵ According to eMarketer.com, there were 124.4 million Android smartphone users and 105.2 million iOS smartphone users in the US in 2019. *Apple Grows iPhone Share in US, Despite Overseas Challenge*, EMARKETER.COM (Mar. 12, 2019), www.emarketer.com/content/apple-grows-iphone-share-in-us-despite-overseas-challenge.

Blackberry OS, which has been around since 1999. Nokia also had a mobile operating system, Symbian OS, which was the dominant system until 2010.⁴⁶ Where would we be today if multiple mobile operating systems were not allowed to compete? As Joseph Schumpeter explained, benefits from innovation competition are achieved when innovators try to out-perform one another in order to earn the exclusive business of consumers for some period of time.⁴⁷ Competition in dynamic industries is “for the field” rather than “within the field.” This is exactly what we have seen in the mobile industry.

Second, the Furman Report seems to suggest that this proposed open standard would not incorporate patented inventions, or if it does, the holders of any patented inventions that are incorporated into the open standard would allow the use of their inventions for free (“freely available”).⁴⁸ While we all like free goods, economists have long known that there is no free lunch. Such principles violate the basic laws of economics.

Take supply and demand. Every economics student knows that consumer surplus is the difference between the value (or utility) that the consumer derives from the good or service (as shown by the demand curve) and the price the consumer pays for that good/service. While consumer surplus, and in turn consumer welfare, would be largest if the cost of the good to the consumer were zero, we know that is unsustainable. Why? At the price of zero, no producer would be willing, nor would she be able to provide the good. There is a cost to provide the good and producers cannot justify selling a good without recuperating marginal cost in the short-run and average total cost in the long-

⁴⁶ Marko Milijic, *CRAZY Android vs iOS Market Share Discoveries in 2020*, LEFTRONIC (Nov. 15, 2019), <https://leftronic.com/android-vs-ios-market-share/#:~:text=Between%202012%20and%202019%2C%20the,Android%20devices%20around%20the%20world.>

⁴⁷ See Gilbert, Richard, *Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate?*, 6 INNOVATION POL’Y & ECON. 164-67 (2006).

⁴⁸ FURMAN REPORT, *supra* note 42, at 71. (“Systems built using open standards are commonly referred to as those that were built using technical specifications that are agreed in common and freely available.”).

run. Producers do not get raw materials, electricity, and other essential inputs to production for free. Producers also need to be compensated for time and investments. Why? Because the individual's economically rational choice is to devote time and effort to activities that compensate the best. Intellectual property is no different. If the supply of a good must be at a price of zero, the quantity supplied would be forced to zero.

Put another way, while my enjoyment of the latest generation mobile device might be highest if I did not have to pay for it, would a producer be able or willing to provide it for free? Forcing inventions to be free would similarly result in no intellectual property owners with valuable inventions willing to contribute to a standard, which would hurt consumers in the long run. The consequence of forcing goods and inventions to be free is forcing the quantity supplied to be zero. As a society, do we want to have innovative goods and services, and pay for them, or do we want to not pay for and not have innovative goods and services? The two are undetachable.

Not all developers and product innovations are successful and many ventures fail.⁴⁹ The incentive to innovate is the difference in profit that a firm can earn if it invests in R&D compared to what it would earn if it did not invest.⁵⁰ The incentive thus depends on many factors that drive that difference in profit, including the characteristics of the

⁴⁹ For example, some have suggested that 70 to 80 percent of technology-based start-ups do not see the projected return on investment, and 30 to 40 percent of the start-ups end up with investors losing most or all the money they put into the company. See Carmen Nobel, *Why Companies Fail-and How Their Founders Can Bounce Back*, HARV. BUS. SCH. WORKING KNOWLEDGE (2011), hbswk.hbs.edu/item/why-companies-failand-how-their-founders-can-bounce-back; see also Deborah Gage, *The Venture Capital Secret: 3 Out of 4 Start-Ups Fail*, WALL ST. J. (Sept. 20, 2012), www.wsj.com/articles/SB10000872396390443720204578004980476429190.

In addition, between 1991 and 2010, only 19.3% of potential new drugs entering phase I trials were eventually approved for medical use. See Tohru Takebe, Ryoka Imai & Shunsuke Ono, *The Current Status of Drug Discovery and Development as Originated in United States Academia: The Influence of Industrial and Academic Collaboration on Drug Discovery and Development*, 11 CLINICAL & TRANSLATIONAL SCI. 597 (2018).

Moreover, roughly one third of engineering R&D projects funded through innovation programs at the US DoD, US DoE, NIH, NSF, and NASA, failed or were discontinued by the research team. See Albert Link & Mike Wright, *On the Failure of R&D Projects*, 62 IEEE TRANSACTIONS ON ENG'G MGMT. 442 (2015).

⁵⁰ Gilbert, *supra* note 47, at 162-63.

invention and the strength of intellectual property protection, among others. The strength of intellectual property protection is an important determinant of the profit from invention because it determines the extent to which the inventor can exploit the potential of her discovery to add value, including the benefit from licensing the invention. If the inventor cannot license to others, or cannot do so with appropriate compensation, the difference in profit with and without R&D would be small or nil, which in turn could reduce the incentive to innovate.

Similar economic logic explains why the Furman Report's recommendation with respect to personal data mobility could be problematic and stifle rather than enhance competition and innovation. In the Report, Furman et al. recommended that "[t]here may be situations where opening up some data held by digital businesses and providing access on reasonable terms is the essential and justified step needed to unlock competition."⁵¹ This recommendation is based on the observation that data are of key importance and a driver of concentration and barrier to competition in digital markets. Most would agree that in the digital age, data are important, but it is not clear why requiring companies to share their data would be good policy. Data are an asset, similar to production capacities or know-how, that companies invest in. As many are aware, not all data are valuable, raw data are not necessarily valuable, but retrieving the right data and organizing the data in an informative manner can require significant investment. A policy that requires mandatory sharing of data held by digital businesses not only risks significant privacy concerns, it may also have other unintended consequences. For example, if businesses are forced to share their assets with their competitors, this could reduce (or possibly deplete) the difference in profit that they could earn if they invest in data, compared to what they could earn if they did not invest. This, in turn, could dampen (or eliminate, depending on the degree) the incentive to continue to invest. For businesses

⁵¹ FURMAN REPORT, *supra* note 42, at 9.

that have yet to invest, the difference in profit they could earn if they invest in data compared to what the business could earn if it did not invest, could also fall (or disappear). They could obtain access to the asset “on reasonable terms” without investing. We would have a “free-rider” problem. The combined effect is that instead of a race to the front, in investing and collecting the best database (asset), businesses would prefer to drag their feet to finish last in the race. We need to ask ourselves; would this be good for innovation and competition?

B. Proposals on Data and Protocol Interoperability

In 2019, the European Commission issued a report on competition policy for the digital era that, among other topics, discussed data and protocol interoperability, and argued that there is a case for imposing duties to grant protocol interoperability and data interoperability upon dominant platforms.

1. Protocol, Data, and Full Protocol Interoperability

Recognizing the increasing importance of data, the EC Report discussed data regulation in the context of promoting competition on platforms.⁵² In particular, in addition to data portability (to avoid data-driven lock-ins), there are three types of interoperability: protocol, data, and full protocol. Protocol interoperability would allow two services or products to interconnect, technically, with one another. Data interoperability, on the other hand, would allow continuous and potentially real-time access to user data. Full protocol interoperability refers to standards that would allow substitute services to interoperate, for example, in messaging systems.

Protocol interoperability allows for the development of complementary services and competition on the merit of those services, but may require the development of

⁵² EC REPORT, *supra* note 13, at 58-59.

standards.⁵³ Importantly, the EC Report recognizes that if the development of standards is defined too narrowly or too early, it could hinder innovation, as discussed earlier in Section III.A.

The EC Report indicates that data interoperability allows for complementary services to platforms or to other services to be developed in a larger range of cases than protocol interoperability. While it can also favor multi-homing, allowing users access to several services or platforms along with complementary services and fostering competition in mature markets, the Report cautions that data interoperability “can also have some anti-competitive consequences by limiting the incentives for new forms of collection of data.” Indeed, and as discussed in Section III.A., a policy that requires mandatory sharing of data held by digital businesses with competitors could dampen or eliminate the incentive to continue to invest, facilitate a “free-rider” problem, and reduce rather than increase competition.

Similarly, the Report also discusses that while “full protocol interoperability has the benefit that positive network effects stemming from the larger user base of one platform extend to other platforms,”⁵⁴ it can come at a high price. Full protocol interoperability needs strong standardization across competing platforms, which could significantly dampen the platforms’ ability to innovate, and to differentiate the types of services they provide.⁵⁵ Indeed, as discussed earlier, although standards enable

⁵³ *Id.*

⁵⁴ *Id.* at 59. (“Full *protocol interoperability* has the benefit that positive network effects stemming from the large user base of one platform extend to other platforms in other words, through the imposition of interoperability requirements, the benefits of positive network effects can be shared among direct competitors. In this perspective, interconnection could be an efficient instrument to address concentration tendencies.”).

⁵⁵ *Id.* (“On the other hand, *full protocol interoperability* can come at a high price: the need for strong standardisation across several competing platforms could significantly dampen their ability to innovate and to differentiate the type(s) of service(s) they provide. One of the most important grounds for continuing competition between platforms, and possibly for competition for the market, could therefore be weakened or even eliminated. Furthermore, the need for coordination between the firms affected by the requirement

innovators to build upon existing inventions in a compatible manner, standards can also inhibit innovators from building inventions that could potentially be bigger and better outside of the prevailing standard. Inertia could inhibit breakthrough innovations.

That said, in a later chapter about mergers and acquisitions in the digital field, the EC Report argues that there is a case for imposing duties to grant protocol interoperability and data interoperability upon dominant platforms.⁵⁶ Specifically, the Report argues that data interoperability can be a remedy against anti-competitive leveraging of market power into markets for complementary services.⁵⁷ Further, the Report states that data interoperability may be a good alternative to the break-up of firms. The reason, the Report argues, are that we may be less concerned about appropriability of profits and more concerned with behavior that maintains or increases power, and that in turn lowers the likelihood and incentive for “disruptive and complementary innovation.”⁵⁸

Protocol interoperability would allow two or more services or products to interconnect, technically, with one another. Allowing technical interconnectivity can be pro-competitive, as users can switch from one platform to another, if the technical interconnectivity does not require either platforms to adopt the standards of one platform at the expense of its own innovation or innovative features. An example is the type of

would provide opportunities for collusive behaviour, for instance to limit innovation.”).

⁵⁶ *Id.* at 60.

⁵⁷ *Id.* at 125 (“We have discussed the role that data interoperability may play: with a view to dominant platforms, it can be a remedy against anti-competitive leveraging of market power into markets for complementary services. Where vertical and conglomerate integration and the rise of powerful ecosystems may raise concerns, requiring dominant players to ensure data interoperability may be an attractive and efficient alternative to calling for the break-up of firms – a way that allows us to continue to benefit from the efficiencies of integration.”).

⁵⁸ EC REPORT, *supra* note 13, at 127. (“In a setting in which the barriers to entry are high and the position of dominance is entrenched, we may, therefore, be less concerned about appropriability of profits and more concerned with behaviour that fortifies or expands positions of power and that decreases both possibilities and incentives for disruptive and complementary innovation. Attempts to precisely compute and balance innovation effects will frequently be futile and we consider that ensuring the persistence of competitive pressure to the benefits of users is a sound pro-innovation competition policy.”).

interoperability between Apple's operating system for Mac, macOS, and Microsoft Office products. The Apple and Microsoft products are both company inventions without compromises, but because Microsoft offers its Office suite for Mac users, users who prefer MacBooks to PCs are able to enjoy the functions and features of MacBooks, and still use Microsoft Word, Excel, and other Microsoft Office products. Such interoperability can create more intense competition between Apple's and Microsoft's operating systems, as well as between Apple and PC hardware manufacturers, as users that rely on Microsoft's Office Suite have both as options. Such interoperability was not mandated, but Apple and Microsoft decided to collaborate as it made business sense to both. From Apple's perspective, all else equal, the interoperability can induce more users – in particular those who were hindered from choosing Mac – to choose Mac over PC. From Microsoft's perspective, the interoperability allows it to increase its sales of Microsoft Office to Mac users, in addition to PC users. The result is a win-win situation, in which Apple, Microsoft, and users can all benefit from the interoperability.

Protocol interoperability that benefits consumers can and does occur without mandate. A blunt mandate to impose protocol interoperability across the board on dominant platforms could do so without assessing whether in each specific case the result would be win-win all around, and importantly whether the result would be a win for consumers. Although it may be hard to compute and balance innovation effects, it is hard to know the overall consumer welfare effects without taking into account the effect a protocol interoperability mandate would have on not only static but dynamic innovation. While technical interconnectivity could allow more competition in the short-term, it could reduce competition and innovation in the longer-term, especially if it required the adoption of the standards of one platform at the expense of a firm's own innovation or innovative feature. Other questions relevant to consumer welfare include: how the technical interconnectivity required by such a mandate would affect innovation of either products or services? Interoperability can work in both directions in terms of its effects

on dominant platforms and smaller players: would it reduce the incentive and ability of the smaller competitor to differentiate its product or services?

Data interoperability on the other hand would allow continuous and potentially real-time access to user data. Imposing duties to grant data interoperability upon dominant platforms is essentially mandating data sharing, which I will discuss next.

2. Mandated Data Sharing

Notably, the European Commission recognizes that competition is driven by the search for opportunities for profitable investments, and that competition law “must not kill economic actors’ incentives to invest and innovate.”⁵⁹ Competition law thus must take incentive effects into account before imposing a duty to grant access to data. The EC Report indicates that sharing of data with competitors may promote competition and innovation in the industry when data are produced as a by-product of another activity, and incentives to generate such data will persist regardless of whether competitor access is mandated. Where the essential business model of the platform is premised on acquiring a large user base and a large amount of data, data collection cannot be considered a mere by-product of another activity.⁶⁰ In this case, the incentives to invest in new products and acquire consumers is intrinsically linked to data acquisition. However, the EC Report cautioned, in platform settings platforms have superior ability to monetize data, and this ability itself generates huge incentives to invest.⁶¹ The EC Report argued that data-driven

⁵⁹ *Id.* at 105. (“Competition is driven by the search for opportunities for profitable investments. Irrespective of dominance, competition law must not kill economic actors’ incentives to invest and innovate. In a data-driven economy, this is also true with regard to investment in data collection and processing. Thus, competition law must take the incentive effects into account before imposing a duty to deal, or more specifically a duty to grant access to data.”).

⁶⁰ *Id.* at 106.

⁶¹ *Id.* (“However, in these platform settings, another aspect may gain in relevance, namely the strong indirect network effects that such platforms – and in particular dominant ad-funded platforms – seem to be able to generate through their superior ability to monetise data. This ability appears to generate huge incentives to invest; incentives which do not vitally depend on engaging in a data-driven leveraging of

feedback loops would tend to further entrench dominance, and the benefits for competition and innovation with mandated data sharing may outweigh the negative effects on the dominant firm.

While many digital platforms today monetize data through advertising revenues, that is their only source of revenue to fund the investments they make and the ongoing costs they incur to attract users to the platforms. To attract users to the platform, platform owners often make significant investments to be able to offer free services to users, whether it is search, text messaging, social media, or driving directions. These investments are costs to the platforms, not dissimilar to other businesses, to build production capacity or attractive store fronts in order to attract customers. The difference for digital platforms is that (1) given it is an innovation industry, investments in some projects succeed while others fail, and (2) the industry exhibits direct and indirect network effects.

A feature of the innovation industry is that not only do revenues need to cover ongoing costs, they also need to cover fixed costs, including investment costs. In the pharmaceutical sector or the music industry, for instance, revenues often exceed ongoing, marginal costs of production. It is understood that revenues are necessary to recoup fixed cost and investment costs for successful and failed drugs or music titles. The fact that revenues exceed ongoing costs does not imply that if revenues were reduced, the same effort and innovation would still take place, because that level of revenue might just be enough for the current level of effort and investments. In digital platforms, the fact that platforms are able to monetize data alone does not mean it has “huge incentives to invest,” and that data sharing would not hinder the platforms’ incentives to invest. To fully understand how data sharing might affect the incentives of platforms, we would need to fully take into account their costs, including operating costs, investment costs,

market power to additional aftermarkets.”).

and the opportunity costs of the investments.

With respect to the effect of indirect network effects and the data-driven feedback loops that the EC Report notes would tend to further entrench dominance, there are self-disciplining effects by virtue of the two-sided nature of platforms. While more users, and more data collected on one side of the platform makes the platform more attractive to advertisers, and the revenues from advertisers help to make the platform more attractive to draw in more users, network effects can also work against the dominant platform when it does not balance the interests of both sides of the platform. Television stations could lose viewers when they do not provide the quality viewers expect or show too many advertisements (perhaps part of what helped contribute to success of streaming services like Netflix and Hulu). Text messaging or social media apps could lose users when they do not adequately protect the privacy of their users. Similar to SDOs, due to the two-sided nature of platforms, the rules that platforms make need to balance the interests of both sides of the platforms, as they require both sides to function and grow.

Network effects can cut both ways. While network effects can be the reason for a platform's rocket-like rise, they can also be the reason for its meteoritic fall. With multi-homing and low switching costs, users are able to move from platform to platform easily, which makes the barriers to entry low to challenge even dominant platforms. We have seen evidence that users can switch quickly to alternative platforms. For example, WhatsApp was used by 90% of Brazil's internet population. When WhatsApp was banned in Brazil, Brazilian users signed up for alternative services in a matter of hours.⁶² While Skype was arguably one of the first to market in video calls and conferencing almost two decades ago (and owned by tech giant Microsoft since 2011), the emergence of Zoom was massive and fairly instantaneous when the COVID-19 pandemic hit, and

⁶² See, e.g., Mike Murphy, *Brazil Shut Down WhatsApp for Roughly 100 Million People for 12 Hours*, QUARTZ, <https://qz.com/576485/brazil-has-shut-down-whatsapp-for-roughly-100-million-people/>.

video conferencing became a necessity for both work and personal applications.⁶³

Any drastic measures such as one that imposes mandatory data sharing on dominant platforms ought to be considered only after having carefully and comprehensively examined the empirical evidence on whether such mandates are truly necessary, and with an understanding of the effect that they would have on competition and innovation in the short and long term.

⁶³ See, e.g., Chris Stokel-Walker, *How Skype Lost Its Crown to Zoom*, WIRED (May 12, 2020), <https://www.wired.co.uk/article/skype-coronavirus-pandemic>.