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Aggregated Royalties for Top-Down FRAND Determinations: Revisiting "Joint Negotiation"

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AGGREGATED ROYALTIES FOR TOP-DOWN FRAND DETERMINATIONS: REVISITING "JOINT NEGOTIATION"

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ABSTRACT

In an environment in which widely-adopted technical standards may each be covered by large numbers of patents, there have been increasing calls for courts to determine "fair, reasonable and non-discriminatory" (FRAND) royalties payable to holders of standards-essential patents (SEPs) using "top-down" methodologies. Top-down royalty approaches begin with the aggregate royalty that should be payable with respect to all SEPs covering a particular standard, and then allocate a portion of the total to individual SEPs. Top-down approaches avoid many drawbacks associated with bottom-up approaches in which royalties for individual SEPs are assessed, often in an inconsistent and piecemeal manner, without regard for the other SEPs that cover the standard. Yet despite the potential benefits of top-down methodologies, one of the most promising means for determining aggregate royalty levels – joint agreement by the members of the relevant standards-development organization (SDO) – has gained little traction. The idea of SDO participants jointly negotiating FRAND royalties attracted the attention of commentators and antitrust agencies about a decade ago, when a handful of SDOs began to explore mandatory ex ante rate disclosure requirements. But few SDOs adopted such policies, and joint negotiations were never incorporated into the mainstream standardization process. One of the principal reason that SDOs have been hesitant to endorse joint royalty negotiations is the perceived risk of antitrust liability arising from concerted action among competitors. But as numerous commentators and antitrust officials have reiterated, this fear is largely misplaced in the context of industry standard-setting. Thus, SDOs should follow the lead of patent pools and begin more actively to determine aggregate patent royalty burdens for standards that they develop. In addition, antitrust and competition authorities should assure the market that collective agreement on aggregate royalty rates alone should not give rise to antitrust liability.

Keywords: FRAND, standards, SEP, patent, joint negotiation, oligopsony

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I. THE CASE FOR AGGREGATED STANDARDS ROYALTIES

A. Many Patents, Many Royalties?

Many standards development organizations (SDOs) require that their participants license patents that are essential to standardized products (standards-essential patents or SEPs) to product manufacturers on terms that are fair, reasonable, and non-discriminatory (FRAND). An extensive literature and growing body of case law exists regarding the determination of FRAND royalties.[1] But even if individual royalty rates can be considered "fair" and "reasonable", when large numbers of patents are involved, there is a risk that the total royalty burden on a standardized product can become excessive. This is the familiar issue of royalty stacking. As has been discussed extensively in the literature, royalty stacking is a variant of the well-known Cournot complements problem in which different firms each control necessary inputs to production and act in an uncoordinated manner when charging a manufacturer for the use of those inputs.[2] As the U.S. Court of Appeals for the Federal Circuit has explained,

> [r]oyalty stacking can arise when a standard implicates numerous patents, perhaps hundreds, if not thousands. If companies are forced to pay royalties to all [patent] holders, the royalties will 'stack' on top of each other and may become excessive in the aggregate."[3]

Under most current SEP licensing frameworks, the negotiation of FRAND license agreements is left to bilateral interactions between SEP holders and manufacturers of standardized products. In these cases, SEP holders have little incentive to consider royalty rates charged by anyone other than themselves. Yet some broadly adopted standards are covered by patents held by dozens and sometimes more than a hundred different firms.[4] Thus, if each of

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[1] *See, generally*, Chryssoula Pentheroudakis & Justus A. Baron, *Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases*. JRC Science for Policy Report EUR 28302 at 95-96 (2017) (collecting and summarizing cases); Jorge L. Contreras, *Patents, Technical Standards and Standards-Setting Organizations: A Survey of the Empirical, Legal and Economics Literature, in* RESEARCH HANDBOOK ON THE ECONOMICS OF INTELLECTUAL PROPERTY LAW: ANALYTICAL METHODS (Vol. 2) (Peter Menell et al., eds., 2017) (collecting literature).

[2] *See, e.g.*, Pierre Régibeau, Raphaël De Coninck and Hans Zenger, Transparency, Predictability, and Efficiency of SSO-based Standardization and SEP Licensing: A Report for the European Commission 15-17 (2016) (discussing relevance of Cournot complements problem in standard-setting); Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2013–15 (2007) (describing the problems of Cournot complements and double marginalization and their potential to lead to hold-up in SEP markets), Joseph Farrell, John Hayes, Carl Shapiro & Theresa Sullivan, *Standard Setting, Patents, and Hold-Up*, 74 ANTITRUST L.J. 603, 642 (2007) ("the sum of the incremental values of [multiple] patents exceeds their value in combination").

[3] Ericsson, Inc. v. D-Link Sys., 773 F.3d 1201, 1209 (Fed. Cir. 2015). *See also* In re. Innovatio IP Ventures, LLC Patent Litig., U.S. Dist. LEXIS 144061 at *62 (N.D. Ill. 2013) ("the determination of a RAND royalty must address the risk of royalty stacking")

[4] *See Microsoft Corp. v. Motorola, Inc.*, Findings of Fact and Conclusions of Law, 2013 U.S. Dist. LEXIS 60233 at *213 (W.D. Wash., Apr. 25, 2013) ("[t]here are at least 92 entities that own 802.11 [standard-essential

these SEP holders independently sought to maximize its royalty revenue, patent royalties could far exceed sustainable product prices.[5]

Commentators disagree whether royalty stacking is currently having a significant impact on prices or innovation in industries such as wireless telecommunications that are heavily dependent on standardized technologies. Some researchers claim that there is no empirical evidence that royalty stacking is a significant issue in practice.[6] Estimates of the actual royalty stack for mobile telephone products range from about 4-5%[7] to 30% of the product price.[8] But even if lower-end estimates are accepted, Pierre Régibeau et al. hypothesize that current royalty levels may be depressed due to uncertainty surrounding patent litigation and may rise once litigation is resolved.[9] What's more, there are clear indications that developers of standardized technologies are increasingly transferring SEPs to patent assertion entities (in some cases known as privateers) for the purpose of asserting those patents.[10] If this trend continues, royalty stacking could become a serious issue for product manufacturers, particularly in emerging areas such as the Internet of Things and broadband 5G wireless connectivity.[11]

Given the growing recognition of these issues, commentators, courts and policy makers have become increasingly attracted to mechanisms that take into account the aggregate royalty burden associated with a standard when considering the royalties owed to any particular patent holder. Thus, as the U.S. District Court for the Northern District of Illinois noted in *Innovatio*, "the determination of a [F]RAND royalty must address the risk of royalty stacking by

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patents]"); Bekkers, Rudi & Joel West. 2009. "The limits to IPR Standardization Policies as evidenced by Strategic Patenting in UMTS*," 33 Telecommunications Policy* 80 (72 holders of SEPs covering ETSI's 3G UMTS standard).

[5] *See* Microsoft, 2013 U.S. Dist. LEXIS 60233 at *213.

[6] *See, e.g.*, J. Gregory Sidak, *The Antitrust Division's Devaluation of Standard-Essential Patents*, 104 GEO. L.J. ONLINE 48, 61 (2015) ("By early 2015, more than two dozen economists and lawyers had disapproved or disputed the numerous assumptions and predictions of the patent-holdup and royalty-stacking conjectures."); Anne Layne-Farrar, *Patent Holdup and Royalty Stacking Theory and Evidence: Where Do We Stand After 15 Years of History*? (Submitted for 122nd Meeting of the OECD Competition Committee, Dec. 17-18, 2014), http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/WD%282014%2984&doclanguage=en (also citing lack of empirical evidence).

[7] *See* J. Gregory Sidak, *What Aggregate Royalty to Manufacturers of Mobile Phones Pay to License Standard-Essential Patents?*, 1 CRITERION J. INNOVATION 701 (2016); Keith Mallinson, *Cumulative Mobile-SEP Royalty Payments No More Than Around 5% of Mobile Handset Revenues*, WiseHarbor (2015), http://www.wiseharbor.com/pdfs/Mallinson%20on%20cumulative%20mobile%20SEP%20royalties%20for%20IP%20Finance%202015Aug19.pdf

[8] Ann Armstrong, Joseph J. Mueller, & Timothy D. Syrett, *The Smartphone Royalty Stack: Surveying Royalty Demands for the Components Within Modern Smartphones* (Working Paper, May 29, 2014), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2443848. *But see* Keith Mallinson, *Smartphone Revolution: Technology Patenting and Licensing Fosters Innovation, Market Entry, and Exceptional Growth*, IEEE CONSUMER ELECTRONICS MAGAZINE, Apr. 2015, 60-66 (challenging findings of Armstrong et al.) and Layne-Farrar, *supra* note 6 (also raising several challenges to Armstrong et al.).

[9] Régibeau et al., *supra* note 2, at 19.

[10] *See* Part I.C, *infra*.

[11] *See, e.g.*, Jason R. Bartlett & Jorge L. Contreras, *Rationalizing FRAND Royalties: Can Interpleader Save the Internet of Things*, __ REV. LITIG. __, Part I.D (2017, forthcoming); Fiona Scott Morton & Carl Shapiro, *Patent Assertions: Are We Any Closer to Aligning Reward to Contribution?*, 32 (NBER Working Paper No. 21678, 2015) ("Failure to prevent patent hold-up relating to tomorrow's information technology and communications standards is likely to cause significant social welfare loss in the years ahead").

considering the aggregate royalties that would apply if other [SEP] holders made royalty demands of the implementer."[12] Royalty calculation methodologies that seek to address these issues can broadly be termed "top-down" approaches because they look first to the overall level of royalties associated with a standard and then seek to allocate the appropriate portion of this total to individual patent holders. Top-down approaches implicitly recognize that, when multiple patents cover a single standard, the rate charged by one SEP holder will necessarily affect the rates that the other SEP holders are able to obtain from a single manufacturer.[13]

Top-down approaches contrast with "bottom-up" royalty approaches, in which royalties due to individual patent holders are determined independently of one another, and the total royalty burden emerges only as the sum of its individual components.[14] Courts applying bottom-up approaches have used different royalty calculation criteria and factors case by case, even when patents covering the same features of the same standard have been involved, thus yielding inconsistent and potentially excessive results.[15] For example, in 2013 and 2014, five different U.S. district courts calculated royalties for a total of thirty-five SEPs covering Wi-Fi standards. The aggregate royalty for these thirty-five patents amounted to approximately 4.5% of the total sale price of a typical $50 Wi-Fi router.[16] Yet it has been estimated that there are approximately 3,000 patents covering the Wi-Fi standard,[17] nearly one hundred times the number subject to adjudication thus far. Were the royalty for each of these patents to be calculated in a similarly uncoordinated, bottom-up manner, the aggregate patent royalty on a Wi-Fi router could easily surpass the product's total selling price by at least an order of magnitude.

B. Top-Down Approaches in the Courts

Due to the issues noted above, a number of courts around the world have begun to explore the use of top-down royalty allocation methodologies for standardized products. The U.S. District Court for the Northern District of Illinois took a step in this direction in *Innovatio*, when it held that the aggregate per-product royalty attributable to the Wi-Fi standard should be $1.80, and then apportioned a fraction of this total to the plaintiff.[18] As noted by the trial judge, a "Top Down approach best approximates the RAND rate that the parties to a hypothetical ex ante negotiation most likely would have agreed upon…"[19]

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[12] *Innovatio*, U.S. Dist. LEXIS 144061 at *62 (internal quotes omitted).

[13] *See* Lemley & Shapiro, *supra* note 2, at 2011 ("the royalty rate negotiated by one patent holder is affected by the rates the downstream firm pays to other patent holders, so a proper analysis must account for the joint determination of all the royalty rates").

[14] *See* Bartlett & Contreras, *supra* note 11, at Part I.D (discussing and providing examples of bottom-up calculations).

[15] See *id*. at __ and Table 2.

[16] *Id*.

[17] *Innovatio*, 2013 U.S. Dist. LEXIS 144061 at *179.

[18] *See id.*at *83.

[19] *Id*. at *163. *See also* Thomas F. Cotter, *Patent Damages Heuristics*, __ TEX. INTELL. PROP. L.J. __, ms pp. 43-44 (forthcoming 2017) (discussing *Innovatio* top-down analysis), Pentheroudakis & Baron, *supra* note 1, at 95-96 (analyzing top-down approaches *Innovatio* and other cases).

Likewise, in *Samsung v. Apple Japan*[20], the Japanese Intellectual Property High Court held that the aggregate royalty burden for the 3G UMTS standard should not exceed 5%. It then allocated a portion of this total royalty to Samsung's asserted UMTS-essential patent based on the total number of SEPs likely to be essential to the standard.[21]

Perhaps the most significant recent use of a top-down FRAND royalty calculation occurred in *Unwired Planet v. Huawei*, decided by the UK High Court of Justice (Patents) in April, 2017.[22] In this case, the court determined the aggregate royalty attributable to a standard under all applicable SEPs and then allocated an appropriate amount to the SEP holder asserting the patents in suit. Under the court's top-down methodology, the FRAND royalty was calculated as the aggregate SEP royalty burden of a particular standard on a product (i.e., the portion of a smartphone's price that should be charged for all patents covering 4G) multiplied by the percentage of the total number of SEPs held by the plaintiff.[23] To calculate the aggregate royalty burden attributable to the various standards in suit, the court considered public statements made by other holders of SEPs with respect to royalties on those standards.[24] It then calculated the plaintiff's share of the total SEP pool, using a variety of counting and filtering methodologies, including a filter for the likely essentiality of the patents in the asserted portfolio.[25] The result calculated by the court was consistent with the result that it obtained using a methodology based on comparable licenses.[26]

C. Top-Down Approaches and Privateering

In addition to helping courts more fairly determine the royalties owed to individual patent holders, top-down approaches to SEP royalties may also help to address emerging issues associated with "privateering" of SEPs.[27] An increasing number of operating companies that were or are active in standards development appear to be transferring some or all of their SEPs to patent assertion entities (PAEs) for enforcement. One 2015 study found that 77% of all assertions of SEPs covering seven widely-adopted interoperability standards made in U.S.

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[20] Apple Japan Godo Kaisha v. Samsung Electronics Co., Ltd., IP High Court of Japan, 2013 (Ne) 10043 (May 16, 2014).

[21] *Id*. at 132, 137-38 (noting that out of 1889 patent families declared as essential to UMTS, an independent research report issued by Fairfield Resources International, Inc. found that only 529 of these patent families "are or are likely to be essential" to the standard. Accordingly, the court based the royalty due to Samsung on a total pool of 529, rather than 1889, SEP families).

[22] [2017] EWHC 711 (Pat) (Apr. 5, 2017).

[23] *Id.* at ¶178.

[24] *Id.* at ¶¶264-272.

[25] *Id.* at ¶¶325 *et seq*.

[26] *Id.* at ¶476. In *Unwired Planet*, the court did not use the above top-down methodology as its primary means for calculating the FRAND royalty, but as a "cross check" of the result that it obtained using the "comparables" methodology. The reasons that the court discounted the top-down methodology in this case are discussed in Part I.D, below.

[27] *See, e.g.*, D. Daniel Sokol, *Patent Privateering: The Rise of Hybrid Patent Assertion Entities* in PATENT ASSERTION ENTITIES AND COMPETITION POLICY, Ch. 5 (D. Daniel Sokol, ed. 2017); Erik Hovenkamp & Thomas F. Cotter, *Anticompetitive Patent Injunctions*, 100 MINN. L. REV. 871 (2016); BJÖRN LUNDQVIST, STANDARDIZATION UNDER EU COMPETITION RULES AND US ANTITRUST LAWS 412 (2014).

district courts between 2000 and 2015 were made by non-practicing entities.[28] Another recent study found that more than 12% of all declared SEPs have been transferred at least once, outstripping the industry average of 9%.[29] Indeed, the PAEs asserting SEPs in both the *Innovatio* and *Unwired Planet* cases obtained those SEPs from operating companies.[30]

In one recent case, Apple alleged that Nokia, the holder of a large SEP portfolio covering wireless telecommunications technologies, conspired with Acacia and other PAEs to divide Nokia's SEP portfolio so as to inflate licensees' overall royalty burdens. Apple alleged that this conduct violated both the SEP holder's FRAND commitments to ETSI and U.S. antitrust law, and that Nokia and the PAEs entered into a scheme to "diffuse and abuse" Nokia's SEP portfolio by forcing manufacturers to defend multiple suits by different plaintiffs and "demanding far more in royalties than [Nokia] could have sought on its own".[31] Nokia is alleged to have retained a financial interest in the proceeds earned by Acacia and the other PAEs from assertion of the SEPs.[32]

Irrespective of the outcome of this case, it is clear the ability of a SEP holder to increase the total royalty burden associated with a SEP portfolio by diffusing the constituent SEPs among a group of PAEs would be reduced if a top-down royalty approach were used. That is, if the aggregate royalty associated with a particular SEP portfolio were known and fixed in advance, then the number of entities holding and possibly asserting individual SEPs would be immaterial: the aggregate royalty would be the same. It is only when royalties are determined in a case-by-case, bottom-up manner that serial adjudications can yield aggregate royalty burdens that can greatly exceed the value of a SEP portfolio.

D. Insufficient Information for Judicial Aggregate Royalty Assessments

Though, as discussed above, courts have become increasingly drawn to top-down aggregate royalty assessments for SEPs, reliable and systematic methods of determining the aggregate royalty burden on a particular standard have yet to be developed. One reason that aggregate royalty determinations are difficult to make in the current environment is that the royalty rates charged by SEP holders are typically subject to strict confidentiality restrictions and are largely opaque to the public. Thus, though litigants may be required to disclose their own license agreements and rates in a judicial proceeding, there is little that can be done to learn the royalty rates of *other* holders of SEPs covering the same standard if they are not parties to the

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[28] Jorge L. Contreras, *When a Stranger Calls—Standards Outsiders and Unencumbered Patents*, 12 J. COMP. L. & ECON. 507, 528 (2016). *See also* Jorge L. Contreras, Fabian Gaessler, Christian Helmers, and Brian Love *Litigation of Standards-Essential Patents in Europe: A Comparative Analysis*, 32 BERKELEY TECH. L.J. __ (2017, forthcoming) (finding significant levels of SEP assertion by non-practicing entities in Germany and the United Kingdom).

[29] Tim Pohlmann & Knut Blind, Landscaping Study on Standard Essential Patents (SEPs) at 31, Study Commissioned by European Commission DG GROW Unit F.5 (2016).

[30] Innovatio obtained its asserted SEPs from Broadcom. Unwired Planet acquired its asserted SEPs from Ericsson.

[31] Apple Inc. v. Acacia Research Corp., Complaint. No. 16-CV-7266 at 2, 4 (N.D. Cal., filed Dec. 20, 2016).

[32] This case is still at an early stage, and the court has not yet ruled on the substantive issues.

litigation. This lack of transparency pervades industries such as wireless telecommunications and computer networking, which are heavily dependent on standardized technologies, and makes the determination of aggregate royalty rates for these standards challenging at best.[33]

Faced with these challenges, courts seeking to adopt top-down royalty methodologies have been forced to rely upon less reliable means of determining aggregate royalty burdens for widely-adopted standards. Thus, in most of the cases cited above, courts have used a combination of public statements by SEP holders and other industry participants coupled with other market factors to assess aggregate royalty burdens on standards. For example, in *Unwired Planet*, the court notes eight different press releases and public statements in which industry participants estimated either the total royalty burden for ETSI's 3G and 4G standards, or their share of SEPs covering those standards.[34] In some cases, these rates appeared to be mere ballpark estimates[35] and, as noted by the judge, were "obviously self-serving".[36] As a result of the limited probative value of this evidence, the court chose to use the top-down aggregate royalty rates that it determined solely as a cross-check against the royalty rates that it calculated using comparable license agreements, which it viewed, at least, as "concrete data points."[37]

Even more tenuous evidence was utilized by the Japanese IP High Court in *Samsung v. Apple Japan*[38], which established an aggregate royalty rate of 5% for ETSI's 3G UMTS standard. Like the UK court in *Unwired Planet*, the Japanese court relied on four public statements and informal agreements among industry participants relating to an aggregate 5% royalty cap for UMTS SEPs.[39] On this basis, the court reasons that "many owners of the UMTS standard essential patents support the 5% aggregate royalty cap with a view to preventing the aggregate cap from being excessively high."[40]

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[33] *See* Jorge L. Contreras, Colleen Chien, Thomas Cotter and Brad Biddle. Study Proposal – Commercial Patent Licensing Data (2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2755706 (critiquing lack of transparency in license transactions).

[34] Similar statements were recently relied upon by the parties in *TCL Communication Tech. Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson*, Case No. SACV14-00341 JVS (DFMx), TCL's Redacted Trial Brief at 8 (C.D. Cal. Feb. 14, 2017) [hereinafter TCL Trial Brief].

[35] For example, in one public statement by "wireless industry leaders", the maximum reasonable aggregate royalty level for the 4G LTE standard should be a "single-digit percentage of the sales price". *Unwired Planet* at ¶264(i). Another press release by Huawei anticipated "a low single-digit percentage of sales prices as a reasonable maximum aggregate royalty rate applicable to end-user devices". *Id*. at ¶264(iii). This is not to say, of course, that such statements should be disregarded entirely. In other work, I have argued that public statements made by patent holders in order to influence the market should presumptively be enforceable against them. Jorge L. Contreras, *A Market Reliance Theory for FRAND Commitments and Other Patent Pledges*, 2015 UTAH L. REV 479 (2015). But while such enforcement could, and should, hold patent holders to their promises, it does little to address the problem of aggregate royalty burdens across multiple patent holders.

[36] *Unwired Planet* at ¶269.

[37] *Id.* at ¶270. Fortuitously, the royalty rates calculated by the court using the comparables methodology were quite similar to those calculated using the top-down methodology.

[38] Apple Japan Godo Kaisha v. Samsung Electronics Co. Ltd., IP High Court of Japan 2013 (Ne) 10043 (May 16, 2014).

[39] *Id*. at 131.

[40] *Id*. at 136.

A different approach to determining the aggregate royalty burden for the 3,000 patents essential to the Wi-Fi standard was utilized by the court in *Innovatio*. There, the court first determined, based on expert testimony, that the average profit margin on the sale of a Wi-Fi chip during the relevant period was 12.1%.[41] It then multiplied this percentage by the average price of a Wi-Fi chip during the period ($14.85), yielding an average total profit of $1.80 per chip.[42] The court reasoned that a chip manufacturer could spend no more than its total profit on patent royalties, and therefor equated the aggregate royalty for *all* Wi-Fi SEPs to the chip maker's total profit.[43]

While this methodology has merits, it also suffers from a number of questionable assumptions. First, if a chip manufacturer paid its entire profit to SEP holders, there would be little reason for that manufacturer to remain in business. Clearly, the manufacturer should be entitled to retain some share of the profit on its sales. More importantly, it assumes that the manufacturer's profit of $1.80 per chip does not already reflect the payment of patent royalties, leaving the full amount available for royalty payments. However, it may be the case that the manufacturer is already paying $1.00 per chip in patent royalties, reducing what would otherwise be a profit of $2.80 to $1.80. Finally, while allocating a manufacturer's entire profit to patents covering a single standard may be somewhat plausible for a product such as a Wi-Fi router, which has as its primary purpose the transmission of Wi-Fi signals, it is difficult to apply to products such as smartphones and laptops that are compliant with hundreds of standards.[44] Thus, like aggregate royalty calculations based on public statements, the total profit methodology utilized in *Innovatio* is substantially lacking in precision.

In each of these cases, once the aggregate royalty burden for the relevant standard was determined, the total was apportioned to allocate a corresponding share of the total to the asserting SEP holder.[45] But while the court in each of these cases devoted significant attention to adopting a top-down approach to SEP royalty determination, the effort in each case faltered due to the difficulty of determining the aggregate royalty burden for the standard in question. The next section discusses proposals for improving that determination.

II. PROPOSALS FOR AGGREGATING SEP ROYALTIES

As discussed above, a top-down approach to calculating SEP royalties avoids potential stacking issues when multiple SEPs cover a single standard. However, accurately determining

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[41] *Innovatio*, 2013 U.S. Dist. LEXIS 144061 at *174.

[42] Id. at *180.

[43] *See id*. at *161 ("In the hypothetical negotiation, chip manufacturers facing a demand for a royalty far outstripping their expected profit margin would not agree to take a license on the patents, but would instead exit the chip-making business.") *See also* Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233 ("you can't pay too many royalties before you just run out of profits").

[44] *See, e.g.,* Brad Biddle, Andrew White, & Sean Woods, *How Many Standards in a Laptop? (And Other Empirical Questions)*, 2010 Int'l Telecomm. Union Sec. Telecomm. Standardization, Kaleidoscope Acad. Conf. Proc. at 3 & fig. 2 (finding 251 standards implemented in a typical out-of-the-box laptop computer).

[45] The method for accomplishing this allocation varies from case to case and itself presents a number of complex issues that are beyond the scope of this article.

the aggregate royalty burden for all SEPs covering a standard has proven difficult within a litigation framework. Courts, relying on evidence presented by the parties to the litigation, lack the broader perspective of the other holders of SEPs covering the relevant standard, and, as shown above, the benchmarks that have previously been employed to determine aggregate royalty levels are crude, at best.[46]

Nevertheless, over the past several years a variety of proposals have been made that could improve the determination of aggregate royalty levels for standards. Many of these proposals seek to improve the accuracy of individual FRAND royalty determinations rather than aggregate royalty levels for all SEPs covering a standard. Nevertheless, these proposals are informative when thinking about the determination of aggregate royalty levels. They include both means for improving judicial royalty determinations, as well as modifications to the privately ordered interactions among SDO participants.

A. Litigation Approaches

One of the issues that impacts the calculation of FRAND royalties in litigation is the fact that, in typical patent lawsuit, the plaintiff is a single patent holder. That patent holder has the burden of demonstrating the value of its patented technology by introducing evidence not only of its technical merit, but also of the time, effort and ingenuity that went into its development. In this setting, every patented technology can be made to appear revolutionary. Missing from this picture, however, are the many other patented technologies that contribute to the standard that the asserted patents cover.[47] The value of a patented technology, especially one covering a standard, must be evaluated not in isolation, but in comparison to the other technological contributions to the standard.[48] But infringement actions are litigated patent by patent, patent holder by patent holder. In a typical action, the owners of the other patented and unpatented technologies embodied in a standard are not represented. Rather, the accused infringer must describe the hundreds or thousands of other SEPs covering the standard. Needless to say, this process is not likely to result in an accurate portrayal of the aggregate value of the patented contributions to a standard, nor a useful framework for calculating the aggregate royalty burden on that standard.[49]

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[46] Stanley Besen argues that, given the lack of information available to courts, courts, in general, should not be placed in the position of determining FRAND royalty rates at all. Stanley M. Besen, *Why Royalties for Standard Essential Patents Should not be Set by the Courts*, 15 CHICAGO-KENT J. INTELL. PROP. 19 (2016).

[47] For example, Justus Baron and Tim Pohlmann report that more than 40,000 and 60,000 SEPs have been declared to cover ETSI's 3G and 4G standards, respectively. Justus Baron & Tim Pohlmann, *Mapping Standards to Patents Using Databases of Declared Standard-Essential Patents and Systems of Technological Classification* 9–10 (Regulation & Econ. Growth, Working Paper, 2015), http://www.law.northwestern.edu/research-faculty/searlecenter/innovationeconomics/documents/Baron_Pohlmann_Mapping_Standards.pdf.

[48] *See* Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233, at *__ (W.D. Wash., Apr. 25, 2013), *aff'd*, 795 F.3d 1024 (9th Cir. 2015) (the SEP holder must demonstrate both the value of its patented technology to the relevant standard and the value of the standard to the overall product in which it is implemented).

[49] This problem, and other weaknesses in the current litigation system relating to SEP royalty calculations, are discussed in Bartlett and Contreras, *supra* note 11, at Part II.B.3.

As a result, Jason Bartlett and I have recently proposed that the venerable procedural mechanism of statutory interpleader be resuscitated for suits involving the assertion of patents covering complex technical standards.[50] The interpleader action allows all parties having an interest in a particular asset (e.g., the funds that a manufacturer has available to pay patent royalties with respect to a standard) to be haled into court in a single action to divide that asset amongst themselves. In an interpleader action, each SEP holder may make the case for the value and contribution of its own patented technology. Such an action would thus overcome the information gaps that otherwise limit the analytical power of judicial determinations and are likely to produce a far more accurate result than the methodologies used by courts to date.

This being said, multiparty actions will demand significant resources, both from the parties and the judicial system. While this level of expenditure may be justified in cases involving large product markets and multiple competing SEP holders, it may be desirable to find a more economical alternative for more modest technologies. The next section reviews private ordering proposals that may address this need.

B. SDO-Based Approaches

A number approaches have been proposed that could be taken by SDOs to facilitate the assessment of aggregate SEP royalties. Unlike courts, SDO participants, taken together, have relatively complete information regarding the technologies and patents necessary to determine the value of the relevant standards. Thus, SDOs, which, in essence, are simply aggregations of market actors, may be well-placed to develop the most accurate aggregate royalty burdens for standards. SDO-based approaches useful for determining aggregate royalty burdens fall into two broad categories: those that involve unilateral action by SEP holders, and those that require coordination among multiple SEP holders.

1. Unilateral Approaches - Ex Ante Disclosure

Unilateral approaches generally require patent holders to disclose the maximum rates that they would charge for their SEPs should a patented technology be incorporated into a standard. This approach results in what Joshua Lerner and Jean Tirole refer to as "structured price commitments", in which all SEP holders are required to commit, noncooperatively and simultaneously, to price caps on royalties.[51] If all SEP holders made such commitments, then SDO participants would know, for each potential standard, the aggregate royalty burden associated with that standard. In theory, if alternative technologies were available for standardization, standards developers could also use price as a basis for comparison among these alternatives.

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[50] *Id*.

[51] Josh Lerner and Jean Tirole, *Standard-Essential Patents*, 123 J. POLITICAL ECON. 547 (2015). *See also* Dennis W. Carlton & Allan L. Shampine, *Identifying Benchmarks for Applying Non-Discrimination in FRAND*, CPI ANTITRUST CHRON., Aug. 2014, at 6-7 (referring to such commitments as "preannouncement"); Mark Lemley, *Ten Things to do About Patent Holdup of Standards (And One Not To)*, 48 B.C. L. Rev. 149, 158 (2007) (proposing that patentees specify the content of their RAND licenses ex ante).

A logical extension of disclosing rates prior to finalization of a standard is the "auction" approach modelled by Daniel Swanson and William Baumol.[52] They liken the selection of patented technologies for standardization to an auction in which patent holders compete, based on technical merit and price, to be included in a standard. They reason that such an auction process would result in the selected technologies being priced at their incremental value above the next best alternative, and excluding any "hold-up" value attributable to the later adoption of the standard.[53] Thus, more than simply announcing their royalty rates, patent holders would be able to modify those rates in response to competitive pressure.[54]

These approaches, which have been characterized in the literature as structured price commitments, pre-announcements, pre-negotiation and auctioning, are generally referred to in the industry as "ex ante" disclosure approaches.[55] Ex ante disclosure policies have been adopted by a handful of organizations. In 2006, the Next-Generation Mobile Networks consortium (NGMN), a group comprised primarily of European mobile network operators, adopted a policy that required members to disclose their maximum SEP royalty rates to a trusted third party, which then combined the disclosed rates and reported the aggregated figures to the members.[56] Unfortunately, allowing members to report their maximum rates anonymously and without the need for explanation apparently led to significant inflation in reported rates. According to one researcher, the aggregate royalties reported to NGMN with respect to some standards approached 130% of the relevant product price and were often structured in a complex manner that made comparison difficult.[57]

An ex ante disclosure policy was more successfully adopted by the VMEbus International Trade Association (VITA) in 2007.[58] The VITA policy (which remains in effect today) requires members to disclose their maximum royalty rates for SEPs covering a standard prior to voting to adopt that standard. Though one large patent holder (Motorola) strenuously objected to VITA's

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[52] Daniel G. Swanson and William J. Baumol, *Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power*, 73 ANTITRUST L.J. 1 (2005).

[53] *Id*. at 13.

[54] Despite its theoretical appeal, the Swanson-Baumol auction approach is not generally viewed as a solution that could practically be adopted in the current standard-setting environment. *See, e.g*., Farrell, et al., *supra* note 3, at 635 (questioning whether such an auction process is practical) and Anne Layne-Farrar, Gerard Llobet & A. Jorge Padilla, *Preventing Patent Hold Up: An Economic Assessment of Ex Ante Licensing Negotiations in Standard Setting*, 37 AIPLA Q.J. 445, 451-52 (2009) ("the practical challenges of designing, organizing, and implementing such an auction likely rule out this method for anything more than hindsight-assisted thought experiments").

[55] *See, e.g*., PATENT CHALLENGES FOR STANDARD-SETTING IN THE GLOBAL ECONOMY, 46-47 (Keith Maskus & Stephen A. Merrill eds., 2013) [hereinafter NAS REPORT]; U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 49-56 (2007) [hereinafter DOJ/FTC ANTITRUST & IPR], COMM. ON TECHNICAL STANDARDIZATION, AM. BAR ASS'N, STANDARDS DEVELOPMENT PATENT POLICY MANUAL, App. A (Jorge L. Contreras ed., 2007) [hereinafter ABA PATENT POLICY MANUAL] (referring to the "Ex Ante" Question);

[56] *See* Jorge L. Contreras, *Technical Standards and* Ex Ante *Disclosure: Results and Analysis of an Empirical Study*, 53 JURIMETRICS 163, 178-79 (2013).

[57] CLAUDIA TAPIA, INDUSTRIAL PROPERTY RIGHTS, TECHNICAL STANDARDS AND LICENSING PRACTICES (FRAND) IN THE TELECOMMUNICATIONS INDUSTRY 194 (2010).

[58] *See* Contreras – Ex Ante, *supra* note 56, at 173-74.

ex ante policy and eventually withdrew from the organization,[59] the policy was generally popular with the membership and viewed as improving the standardization process.[60] In addition, VITA sought and obtained a favourable business review letter from the U.S. Department of Justice, acknowledging the potentially procompetitive benefits this approach.[61] The European Commission has likewise indicated that unilateral ex ante disclosures of most restrictive licensing terms do not, in principle, restrict competition within the meaning of Article 101(a) of the Treaty on the Functioning of the European Union (TFEU).[62]

Despite the apparent success of VITA's ex ante policy, few, if any, other SDOs have followed its lead.[63] There are many possible reasons for the unwillingness of most SDOs to adopt ex ante disclosure policies.[64] But whatever the reasons, unless there is a sea change in the attitude of SDO participants, policies requiring individual SEP holders to disclose royalty rates do not seem like viable mechanisms to develop information regarding aggregate royalty burdens for standards.

2. Coordinated Approaches - Aggregate Caps

Though unilateral declarations of maximum royalty rates offer improved transparency for standards developers and product manufacturers, even the most accurate and honest unilateral declarations do not address issues that can arise when multiple "reasonable" royalties are stacked on top of one another. And while auctions and other iterative processes may result in the rationalization of overall royalty rates, such processes may be vulnerable to gamesmanship and

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[59] *Id*. at 174-75.

[60] *Id*. at 204-05.

[61] U.S. Dept. of Justice, Business Review Letter to VMEbus International Trade Association (VITA) (Oct. 30, 2006) [hereinafter DOJ 2006 VITA Letter]. *See also* Renata Hesse, Deputy Assistant Att'y Gen., Antitrust Div., U.S. Dep't of Justice, Remarks at the ITU-T Patent Roundtable: Six "Small" Proposals for SSOs Before Lunch, at 8 (Oct. 10, 2012), *available at* http://www.justice.gov/atr/public/speeches/287855.pdf ("We saw then and continue to see now, the potential benefits to competition of such an approach.")

[62] *See* European Commission, Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal cooperation agreements, Para. 299 (2011) ("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)"). *See also* VALERIO TORTI, INTELLECTUAL PROPERTY RIGHTS AND COMPETITION IN STANDARD SETTING 197-205 (2016) (noting the European Commission's generally favorable view toward unilateral ex ante disclosure of maximum terms).

[63] *See* Rudi Bekkers & Andrew Updegrove, A Study of IPR Policies and Practices of a Representative Group of Standards Setting Organizations Worldwide 94-97 (2012), *archived at* http://perma.cc/U6FN-XK2E (of ten SDOs studied, only VITA requires ex ante disclosure, while IEEE, ETSI and IETF permit it voluntarily). *See also* Contreras – Ex Ante, *supra* note 56, at 175-77, 179-80. Because ex ante disclosure is not mandatory, there have been very few royalty disclosures at IEEE or ETSI. At IETF, a large number of disclosures have been made relating to SEP holders' commitments to license on a royalty-free basis, but very few disclosures state a non-zero royalty rate. *Id*. at 182-83.

[64] See Contreras – Ex Ante, *supra* note 56, at 210-12 (discussing possible reasons for failure of SDOs to adopt ex ante disclosure policies); DOJ/FTC ANTITRUST & IPR, *supra* note 55, at 50 (discussing possible reasons for lack of ex ante negotiation), Régibeau, et al., *supra* note 2, at 43 (discussing shortcomings and "practical difficulties" associated with individual royalty caps).

defection. Coordinated determination of aggregate royalty rates, however, has the potential to yield aggregate rates that include the bulk of SEPs covering a particular standard.

Unlike unilateral approaches, which focus on the disclosure and possible adjustment of royalty rates by individual patent holders, coordinated approaches require the participation of all (or a substantial number) of the holders of SEPs pertaining to a particular standard. As Dennis Carlton and Allan Shampine explain, pre-negotiation of terms by SEP holders can reduce the likelihood of hold-up "as long as firms that can influence the standard can determine, prior to the standard being set, the terms that would be offered if the patent were to be adopted into the standard."[65] Though details vary, coordinated approaches generally seek to establish an overall ceiling or cap on the aggregate SEP royalties that are applicable to a standard. Various methodologies can then be used to allocate that total among individual SEP holders.[66] As such, these coordinated approaches offer an inherently top-down approach to SEP royalties.

Coordinated approaches have been endorsed by commentators, agency officials and SDO participants themselves. In some cases, leading market actors seeking to encourage adoption of a new standard or technology have joined together the make public pledges regarding the rates that they will charge for their patents.[67] For example, between 2002 and 2013, major wireless telecommunications technology providers including Nokia, Ericsson, Alcatel-Lucent, Motorola Mobility and Qualcomm made both individual and joint public commitments to cap the royalties that they would seek on standards such as W-CDMA, LTE and WiMax.[68] It is likely that voluntary commitments such as these helped to induce manufacturers and other market actors to adopt standards known to be covered by significant numbers of patents. This being said, such commitments have been made by only a handful of SEP holders, leaving the majority of SEP holders unaffected. Moreover, as noted above, there is a growing trend toward transfer of SEPs to patent assertion entities, which may not be bound by pricing commitments made by SEP holders outside of the SDO setting.[69] Thus coordinated approaches like these, while better than many alternatives, may still not be ideal mechanisms for arriving at accurate aggregate royalty rates.

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[65] Carlton & Shampine, *supra* note 51, at 7.

[66] Allocation methodologies, while critical to the determination of FRAND royalties, are subject to an extensive literature, a discussion of which is beyond the scope of this article. *See, generally*, Bartlett & Contreras, *supra* note 11, at x (cataloging a range of patent valuation and allocation methodologies, including proportionality/head count, citation count, cost recovery, real option value, substitute cost, footprint, discounted cash flow and comparable license analysis (with associated citations)).

[67] *See* Jorge L. Contreras, *Patent Pledges*, 47 ARIZ. ST. L.J. 543, 578-80 (2015) (discussing economic and strategic rationales for SEP holder pledges beyond the requirements of SDOs).

[68] *Id*. at 559–61 and Table 4 (discussing maximum royalty commitments made with respect to wireless telecommunications standards). As noted above, the courts in *Unwired Planet* and *Apple Japan* referred to several of these pledges in assessing an aggregate royalty burden applicable to ETSI's 2G/3G/4G wireless standards. *See* notes 34-35, *supra*, and accompanying text.

[69] *See* Contreras – Outsiders, *supra* note 28, at 520-21 (outsiders to the SDO process may not be bound by commitments made by SEP holders to SDO).

3. Coordinated Approaches – Joint Negotiation

While the coordination of aggregate royalty caps by SEP holders can yield benefits, such caps are most likely to be accepted broadly if the potential manufacturers of standardized products are involved in determining aggregate royalty levels.[70] The involvement of standards implementers in the royalty determination process can yield several benefits. Most obviously, of course, it will be more likely to result in an aggregate royalty that is viewed as acceptable and reasonable within the relevant industry, resulting in a greater willingness by implementers to enter into license agreements with SEP holders and fewer disputes over SEP holders' compliance with FRAND and other licensing obligations. Moreover, the involvement of implementers in the royalty determination process may lead to royalty rates that more accurately reflect their on-the-ground knowledge of production costs and cycles, as well as potential market demand for the standardized products.

The collective determination of aggregate SEP royalty rates by SEP holders and implementers can be viewed as a multilateral joint negotiation. Joint royalty negotiation proposals have been made by a number of academic commentators. Joseph Farrell and co-authors reason that collective negotiation of royalty rates may avoid both hold-up as well as practical difficulties arising from bilateral negotiation.[71] They suggest that a beneficial approach would be

> to permit members of an SSO collectively to negotiate royalties with patent holders, so long as membership in the SSO does not preclude any individual firm, or group of firms acting in concert, from producing competing products that do not comply with the standard. This approach recognizes the benefits of collective negotiation to prevent hold-up and subjects the SSO to rule of reason evaluation.[72]

Richard Gilbert also reasons that "if standard-related holdup is likely and substantial, joint negotiation of licensing terms by the members of an SSO before a standard issues can help

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[70] Some have suggested that governmental intervention may be necessary to determine appropriate aggregate royalty caps for SEPs. *See, e.g.*, Govt. of India, Dept. of Industrial Policy & Promotion, Discussion Paper on Standard Essential Patents and Their Availability on FRAND Terms at 26 ¶11.f (1 Mar. 2016) (asking "Whether total payment of royalty in case of various SEPs used in one product should be capped? If so, then should this limit be fixed by Government of India or some other statutory body or left to be decided among the parties?") [hereinafter India DIPP Discussion Paper]. Such proposals have met with both opposition and approval. See, e.g., Am. Bar Assn. Sections of Antitrust Law, Intell. Prop. Law, Intl. Law and Sci. & Tech. Law, Joint Comments on the Government of India's Discussion Paper on Standard Essential Patents and Their Availability on FRAND Terms at 14 ("While some SSOs might seek to adopt pricing caps or other voluntary policies, the Sections do not support governmental imposition of industry royalty caps through legislation, regulation or other means") and Centre for Internet & Society, India, Comments on the Dept. of Industrial Policy & Promotion, Discussion Paper on Standard Essential Patents and Their Availability on FRAND Terms at 8-9 (supporting governmental imposition of aggregate royalty caps). Because the focus of this article is on private sector joint negotiation of aggregate royalty caps, the complex issue of governmental rate setting is beyond the scope of the present discussion.

[71] *See* Farrell, et al., *supra* note 2, at 632 ("decentralized or bilateral (patent holder/user) negotiations do not fit well with the [collective] mechanisms by which standards are chosen").

[72] *Id*. at 635.

fill the void left by vague FRAND commitments to limit possible opportunistic conduct".[73] In prior work, I have proposed a methodology termed a "pseudo-pool" in which all relevant stakeholders in a standards-development group, including both SEP holders and product manufacturers, must negotiate and agree upon an aggregate royalty rate for all SEPs covering a standard before the standard is approved or published.[74] I suggest that "[c]onsistent with the FRAND commitment, the Aggregate Royalty must be 'reasonable', taking into account the expected overall market for standardized products, historical royalty rates in the industry, typical product price ranges, and the like."[75] If an SDO does not wish to be the locus for royalty-setting negotiations, then "it may authorize a neutral, outside party (e.g., an arbitration panel or neutral expert appointed by a respected external agency such as the American Arbitration Association (AAA) or World Intellectual Property Organization (WIPO)) to facilitate the Aggregate Royalty determination."[76] Once the aggregate royalty is determined, a subsequent procedure for allocation among the SEP holders is proposed.[77] Finally, because the agreed aggregate rate would be adopted by the relevant SDO, it (and the manner in which royalties are allocated among SEP holders) would be binding on all SDO participants, even if they declined to participate in the rate negotiation.[78] What's more, courts would consistently be able to look to the SDO's publicly announced aggregate royalty rates in every case, whether the SEP holder were a manufacturer, technology developer or PAE.

In a recent report commissioned by the European Commission, Pierre Régibeau, Raphaël De Coninck and Hans Zenger of Charles River Associates also support the use of aggregate royalty caps in standard-setting.[79] They argue that such caps "can be helpful to alleviate the negative effects of both hold-up and royalty stacking."[80] They find market-wide benefits arising from such arrangements, noting that "coordinated pricing of strict complements may allow limiting potentially excessive royalty requests on the part of individual licensors, thereby leading to lower final consumer prices and hence more successful commercialization of end products."[81] And, as in my earlier proposal, Régibeau et al. recognize that in order to be successful, a

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[73] Richard J. Gilbert, *Deal or No Deal? Licensing Negotiations in Standard-Setting Organizations*, 77 ANTITRUST L.J. 855, 858 (2011) (reasoning, however, that bilateral negotiations among SEP holders and implementers may produce similar results if strong non-discrimination provisions are applied). *See also* Layne-Farrar et al., *supra* note 54, at 474 (ex ante bilateral negotiation should be encouraged over joint negotiation).

[74] Jorge L. Contreras, *Fixing FRAND: A Pseudo-Pool Approach to Standards-Based Patent Licensing*, 79 ANTITRUST L.J. 47, 78-84 (2013). This proposal is an expanded version of a proposal submitted to the International Telecommunications Union (ITU) Patent Roundtable held in Geneva on October 10, 2012, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2159749.

[75] *Id*. at 79-80.

[76] *Id*. at 80 (citations omitted).

[77] *Id*. at 81-83 (proposing numerical/proportionality based allocation methodology with over-declaration penalty).

[78] For a discussion of the binding effect of SDO policies on participants, see Contreras – Market Reliance, *supra* note 35. It is worth noting that, even if SDO policy commitments bind SDO participants and those to whom they transfer their SEPs, there is a chance that some SEP holders may be "outsiders" that are not bound by the SDO's policies. *See* Contreras – Outsiders, *supra* note 28 (finding that a non-negligible portion of SEPs are asserted by SDO outsiders).

[79] Régibeau, et al, *supra* note 2, at 43.

[80] *Id*. at 43.

[81] *Id*. at 44.

coordinated aggregate royalty cap should involve the participation of significant SEP holders as well as product manufacturers.[82]

III. ANTITRUST CONSIDERATIONS FOR JOINTLY-NEGOTIATED AGGREGATE ROYALTIES[83]

A. The Threat of Oligopsony

Despite the potential efficiencies that jointly-negotiated aggregate royalty caps may offer to standards developers and implementers, few if any SDOs have adopted them. One of the principal reasons offered by SDOs and patent holders for their reluctance to engage in collective negotiation of aggregate royalty rates is antitrust law. Specifically, it has been suggested that a group of manufacturers negotiating license rates with a SEP holder could collectively exert anticompetitive pressure to depress the SEP holder's royalties below a reasonable level, and even to zero, thereby devaluing the patents covering the standard.[84] As argued by J. Gregory Sidak, "ex ante collective action that is privately undertaken in an [SDO] to counteract potential patent holdup may facilitate, if not serve as an outright façade for, horizontal price fixing by oligopsonists of the patented input."[85] Another line of objection arises from the potential impact of group negotiation on incentives to innovate: "The potential danger .. is that by negotiating as a group, technology users could extract such favourable terms from patent holders (another form of hold-up) that they will inefficiently discourage future innovation".[86]

These arguments have held considerable sway in the industry and have influenced enforcement authorities, particularly in Europe. In early 2005, a proposal to cap aggregate royalty rates on new wireless telecommunications standards was made to ETSI by several of its members.[87] Despite significant interest, discussion of this proposal within ETSI was terminated following receipt of a 2006 letter from the European Commission's Competition Directorate-

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[82] *Id*. at 44-45 ("given that patent-holders seem, understandably, more frightened by the idea of an ex ante aggregate cap than implementers we would suggest that ex ante aggregate royalty caps be set by the SSO members with a significant number of potentially standard-relevant patents").

[83] The analysis in this Part focuses on U.S. antitrust law. While European competition law is mentioned in passing, an analysis of the European legal landscape is beyond the scope of this article. For a comparative analysis of U.S. and EU antitrust law in the area of standardization, see LUNDQVIST, *supra* note 27, and TORTI, *supra* note 62. It is worth noting that at least some European scholars believe that European competition law prohibits as cartels any "coordinated interference with the free market price system", even in the face of countervailing procompetitive effects, thereby exceeding U.S. antitrust law in prohibiting price-related concerted action. Nicolas Petit, *The IEEE-SA Revised Patent Policy and its Definition of 'Reasonable' Rates: A Transatlantic Antitrust Divide*? 27 FORDHAM INTELL. PROP., MEDIA & ENTERTAINMENT L.J. 211, 213 (2016) (drawing on non-IP cases in questioning whether recent amendments to IEEE patent policy run afoul of EU competition law). *But see* Marco Lo Bue, *Are These Cartels? Price Guidelines Adopted by Standard Setting* Organizations (US, Institute of Electrical and Electronics Engineers), 7 J. EUROPEAN COMPETITION L. & PRACTICE 537 (2016) (concluding that recent IEEE policy amendments do not run afoul of EU competition law, despite admitted differences between U.S. and EU law).

[84] J. Gregory Sidak, *Patent Holdup and Oligopsonistic Collusion in Standard-Setting Organizations*, 5 J. COMPETITION L. & ECON. 123, 142–51 (2009). *See also* Farrell, et al., *supra* note 2, at 632.

[85] Sidak, *supra* note 84, at 126.

[86] Farrell, et al., *supra* note 2, at 632.

[87] TAPIA, *supra* note 57, at 165–66.

General.[88] The EC's letter questioned whether an aggregate royalty cap would impermissibly preclude price competition, as it would involve fixing the "price" of each SEP in advance. Instead of an aggregate royalty cap, the Commission expressed a preference for "pure" (unilateral) ex ante disclosures of royalty terms, which would enable price competition among competing patented technologies. Eventually, as noted above, ETSI adopted a policy permitting voluntary disclosures of royalty terms, but not requiring either individual disclosure of royalty terms or collective determination of aggregate royalties.[89]

The U.S. DOJ and FTC have also recognized the potential for joint negotiations to lead to anticompetitive conduct including naked price fixing.[90] Short of such per se illegal conduct, such joint negotiations might also be prohibited under a rule of reason analysis

> if there were no viable alternatives to a particular patented technology that is incorporated into the standard, the IP holder's market power was not enhanced by the standard, and all potential licensees refuse to license that particular patented technology except on agreed-upon licensing terms. In such circumstances, the ex ante negotiation among potential licensees does not preserve competition among technologies that existed during the development of the standard but may instead simply eliminate competition among the potential licensees for the patented technology.[91]

Responding to concerns of this nature, a number of SDOs, including IEEE and ETSI, expressly prohibit the negotiation or discussion of royalty terms during SDO meetings.[92] And even when such coordinated action is not expressly prohibited, it is frequently raised as a concern when aggregate royalty discussions are suggested.[93] As observed by Régibeau, et al, "part of the antitrust community still has an almost instinctive allergy to the idea of rivals setting prices together."[94] If aggregate royalty determinations are to be utilized in top-down FRAND royalty calculations, antitrust aversion to them must be overcome.

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[88] Angel Tradacete Cocera, Letter to Karl Heinz Rosenbrock, Director General ETSI, June 21, 2006. *See* TAPIA, *supra* note 57, at 165 (discussing letter and its effects on ETSI process).

[89] *See* note 63, *supra*, and accompanying text.

[90] *See* DOJ/FTC ANTITRUST & IPR, *supra* note 55, at 51.

[91] *Id*. at 53.

[92] *See* IEEE Standards Assn., IEEE-SA Standards Board Operations Manual, §5.3.10.2 ("No discussions or other communications regarding the following topics shall occur during IEEE-SA working group standards-development meetings or other duly authorized IEEE-SA standards-development technical activities: … -- Specific patent license terms or other intellectual property rights…"); Eur. Telecom. Standards Inst., ETSI Guide on Intellectual Property Rights (IPRs), Version Adopted by Board#94 on 19 September 2013, §4.1 ("Specific licensing terms and negotiations are commercial issues between the companies and shall not be addressed within ETSI").

[93] *See* Régibeau, et al, *supra* note 2, at 45 (discussing response of an SDO participant regarding obstacles to aggregate royalty caps: "Problem 1 is antitrust"); Lemley & Shapiro, *supra* note 2, at 2043 (royalty cap approaches raise "antitrust flags" given that they involve both discussion and agreement on price); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting*, 1 INNOVATION POLICY AND THE ECONOMY 119, 128 (2001) ("many standard setting organizations are wary of sanctioning any specific agreement regarding the magnitude of licensing terms for fear of antitrust liability, as such agreements might be construed as price fixing").

[94] Régibeau, et al, *supra* note 2, at 45.

B. Patent Pools and Aggregate Royalty Determinations

Any analysis of aggregated patent royalties would be incomplete without some consideration of patent pools. In a typical patent pool covering a standardized technology, multiple patent holders designate a single agent to license the pooled patents to third parties at an agreed rate and to distribute net revenues among the pool participants in accordance with a pre-determined formula. Patent pools thus enable product manufacturers to obtain licenses to many patents simultaneously with reduced transaction costs. Pools have been employed effectively in connection with a number of widely adopted standards such as MPEG-2, CD and DVD. In each of these cases, a small group of patent holders formed a pool containing relevant SEPs and excluding patents that were not essential to the standard.[95] The U.S. Department of Justice has reviewed several of these pools and found that they did not raise antitrust concerns. Among the procompetitive benefits that the DOJ attributed to these pools was their ability to "create substantial integrative efficiencies by reducing the time and expense of disseminating . . . patents to interested licensees, clearing blocking positions, and integrating complementary technologies."[96]

The rates at which the pooled patents are licensed is determined by agreement among the contributing patent holders, taking into account relevant market factors.[97] The DOJ and FTC have stated that they "generally do not assess the reasonableness of royalties set by patent pools."[98] Rather, they "focus on the pool's formation and whether its structure, including the terms of the contract among pool participants, would likely enable pool participants to raise prices or restrict output in a relevant market."[99] Thus, merely coordinating the price at which a group of patents will be licensed to others is not itself viewed as anticompetitive, absent other evidence of anticompetitive behavior.[100]

Given the benefits and favorable antitrust assessment of patent pools, it is worth asking why voluntary consensus standardization is still carried out through SDOs that do *not* pool essential patents. Recent studies find that the large majority of SEPs are licensed by individual SEP holders under SDO FRAND rules, rather than as part of patent pools.[101] There are several

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[95] This requirement reduces the risk that the pool will stifle competition by making substitute technologies available in the same package and for a single price. *See, e.g.,* Summit Tech., Inc., 127 F.T.C. 208, 217 (1999) (decision and order); DOJ/FTC ANTITRUST & IPR, *supra* note 55, at 76–78; Letter from Joel I. Klein, Assistant Att'y Gen., U.S. Dep't of Justice, to Carey R. Ramos, Paul, Weiss, Rifkind, Wharton & Garrison LLP, at 10 (Jun. 10, 1999) (DVD6C). The Court of Appeals for the Federal Circuit softened the requirement that only essential patents be included in pools when the inclusion of a non-essential patent does not result in competitive harm. *Princo Corp. v. Int'l Trade Comm'n* (Fed. Cir. 2010, p.1338).

[96] DOJ/FTC ANTITRUST & IPR, *supra* note 55, at 71.

[97] *See, e.g.,* Richard J. Gilbert, *Ties that Bind: Policies to Promote (Good) Patent Pools*, 77 ANTITRUST L.J. 1, 18-25 (2010) (discussing a range of factors that patent pool participants may consider in setting royalty rates).

[98] DOJ/FTC ANTITRUST & IPR, *supra* note 55, at 82.

[99] *Id*. at 82-83.

[100] *Id*. at 83.

[101] *See* Pohlmann and Blind, *supra* note 29, at 36-37 and Fig. 22 (91% of worldwide declared SEPs are licensed directly rather than pooled); Biddle et al., *supra* note 44, at 3 & fig. 2 (of 251 standards embodied in a typical laptop

reasons that this may be the case. First, the formation of a patent pool can be expensive. Unlike SDOs, patent pools must ensure, with a reasonable degree of certainty, that the pooled patents are actually essential to the relevant standard.[102] For this reason, parties creating patent pools typically engage in a lengthy and costly vetting process to assess the essentiality of each patent that is proposed for inclusion in the pool. Estimates of the cost of such assessments are in the range of US$10,000 per patent.[103] Because many SDO standards are never widely adopted or have limited application, and given the large numbers of patents that are sometimes involved, most SDO participants are reluctant to make up-front investments of this magnitude for every standard under development.[104] Mark Lemley and Carl Shapiro also observe that pool formation around complex interoperability standards may be hindered by the number of patentees and patents involved, significant variations in the scope and strength of these patents, and the involvement of non-manufacturing patent holders.[105] Thus, for several reasons, while SDO-developed standards are vulnerable to the patent stacking issues addressed by patent pools, SEPs covering these standards are typically not included in patent pools.

C. Joint Negotiation and Procompetitive Benefits

Like the holders of pooled patents, SDO participants can achieve efficiencies and other procompetitive benefits by coordinating the aggregate rates at which SEPs covering a standard are licensed. As noted by Mark Lemley and Carl Shapiro, collective negotiation of SEP royalty rates is "very likely to be procompetitive if the technology would otherwise be so encumbered by patent rights and blocking positions that the standard would have difficulty moving forward in the market."[106] Robert Skitol argues that such joint activity also enhances the "quality of decision making" within an SDO and "increases the prospects for achieving a procompetitive 'open' standards outcome".[107] Moreover, Shapiro observes that some SDOs' discouragement or outright prohibition of ex ante discussion of pricing terms[108] has had the ironic result of "embolden[ing] some companies to seek substantial royalties after participating in formal standard setting activities."[109]

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computer, 75% were SDO-developed standards subject to FRAND commitments, while only 3% were included in patent pools).

[102] *See* note 95, *supra*, and accompanying text.

[103] *See* Jorge L. Contreras, *Essentiality and Standards Essential Patents* in CAMBRIDGE HANDBOOK OF TECHNICAL STANDARDIZATION LAW – PATENTS, ANTITRUST AND COMPETITION LAW (Jorge L. Contreras, ed., 2017 forthcoming) (collecting sources).

[104] *See id*.; Contreras, Fixing FRAND*, supra* note 74, at 77.

[105] Lemley & Shapiro, *supra* note 2, at 2015.

[106] *Id*. at 2043-44.

[107] Robert A. Skitol, *Concerted Buying Power: Its Potential for Addressing the Patent Holdup Problem in Standard Setting*, 72 ANTITRUST L.J. 727, 735 (2005). *See also* Contreras, Fixing FRAND*, supra* note 74, at 88-90 ("it should be possible, with adequate precautions in place, to ensure that price competition does occur within the pseudo-pool structure proposed here"); Lemley, Ten Things, *supra* note 33, at 161 ("the law ought to permit SSO members the latitude to discuss royalty rates collectively before the standard is set"); Farrell et al, supra note 3, at 635

[108] *See* note 92, *supra*, and accompanying text.

[109] Shapiro, *supra* note 93, at 142.

The U.S. antitrust enforcement agencies have also indicated that ex ante joint negotiation of SEP licensing terms has "the strong potential for procompetitive benefits".[110] As early as 2005, Deborah Platt Majoras, Chairman of the FTC, specifically explained the potential procompetitive benefits of joint ex ante negotiation of licensing terms in the SDO context:

> [J]oint ex ante royalty discussions . . . can be a sensible way of preventing hold up, which can itself be anticompetitive. Put another way, transparency on price can increase competition among rival technologies striving for incorporation into the standard at issue. They may allow the "buyers" (the potential licensees in the standard-setting group) to get a competitive price from the "sellers" (the rival patentees vying to be incorporated into the standard that the group is adopting) before lock in ends the competition for the standard and potentially confers market power on the holder of the chosen technology. . . . If joint ex ante royalty discussions succeed in staving off hold up, we can generally expect lower royalty rates to lead to lower marginal costs for the standardized product and lower consumer prices. By mitigating hold up, joint ex ante royalty discussions might also make possible the more timely and efficient development of standards. A reduction in ex ante uncertainty on royalty rates may reduce the extent to which litigation is needed to resolve issues relating to patent and standards. Joint ex ante royalty discussions also could prevent delays in the implementation of the standard resulting from ex post litigation (or threats of it), which may involve inefficient allocation of resources intended for innovation.[111]

In response to suggestions that "group buying power" might be used inappropriately by SDO members to depress SEP prices, the DOJ and FTC acknowledge that the use of ex ante licensing discussions as "a sham to cover up naked agreements on the licensing terms each IP holder will offer the SSO", a means "to reach side price-fixing agreements" or an effort "to fix the price of standardized products" would likely be condemned as *per se* violations of the antitrust laws.[112] However, the agencies go on to note that these risks "are not sufficient to condemn *all* multilateral *ex ante* licensing negotiations, particularly given the fact that [t]hose developing standards already have extensive experience managing this risk."[113] In contrast, they conclude that:

> [i]n most cases, it is likely that the Agencies would find that joint *ex ante* activity undertaken by an SSO or its members to establish licensing terms as part of the standard-setting process is likely to confer substantial procompetitive benefits by

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[110] DOJ/FTC ANTITRUST & IPR, *supra* note 55, at 54. *See also* DOJ 2006 VITA Letter, *supra* note 61, at 9 n.27;

[111] Deborah Platt Majoras, Chairman of the Fed. Trade Comm'n, Remarks at the Standardization and the Law Conference: Recognizing the Procompetitive Potential of Royalty Discussions in Standard Setting, at 7-8 (Sept. 23, 2005), *available at* http://www.ftc.gov/speeches/majoras/050923stanford.pdf (citations and internal quotation marks omitted).

[112] DOJ/FTC ANTITRUST & IPR, *supra* note 55, at 55.

[113] *Id*. (emphasis in original, internal quotation marks omitted).

avoiding hold up that could occur after a standard is set.[114]

Based on this reasoning, the agencies conclude that joint *ex ante* negotiation of licensing terms in the standard-setting context should not be condemned as *per se* illegal, but rather evaluated on a rule of reason basis.[115]

Michael Carrier identifies several characteristics of SDOs that significantly reduce the risk of anticompetitive oligopsonistic behavior by product manufacturers. These include the involvement of SEP holders in royalty negotiations, the power that SEP holders wield in the standardization process, the unpredictability regarding which patented technologies will ultimately be included in a standard, and the inability of product manufacturers to reduce their purchases to depress prices.[116]

Moreover, were product manufacturers in an SDO to exert the type of oligopsonistic downward royalty pressure envisioned by Sidak and others,[117] patent holders would likely defect from such an SDO.[118] The abandonment of an SDO by patent holders would remove such patent holders from the ambit of the SDO's rules, including its FRAND commitments. Thus, forcing patent holders out of SDOs would worsen the position of implementers, as SEP-holding "outsiders" could charge substantial and comparatively unconstrained (i.e., supra-FRAND) royalties for licenses of their SEPs and seek injunctions against the use of their patented technologies.[119] Thus, even to the extent that potential anticompetitive effects could arise from joint negotiation of aggregate royalties, in the words of one senior DOJ official, these must be balanced against "the inefficiencies of ex post negotiations and licensing hold up."[120]

Admittedly, it is likely, as several economists predict using different negotiation models, that SEP royalties negotiated collectively will be lower than those that would be negotiated in serial bilateral transactions.[121] This result has the potential to reduce investment incentives for

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[114] *Id.* at 52. *See also* Skitol, *supra* note 107, at 735 ("There is nothing 'naked' or otherwise resembling cartel activity in the general idea of standard-setting participants' consideration of --- or indeed even negotiation over --- proposed license terms for a patent on technology that may be written into a proposed standard").

[115] DOJ/FTC ANTITRUST & IPR, *supra* note 55, at 55. The agencies go on to note that such joint negotiations could give rise to antitrust concern under a rule of reason analysis. *Id*. at 53 (text quoted in passage accompanying note 91, *supra*).

[116] MICHAEL A. CARRIER, INNOVATION FOR THE 21ST CENTURY: HARNESSING THE POWER OF INTELLECTUAL PROPERTY AND ANTITRUST LAW 337-38 (2009).

[117] *See* notes 84-85, *supra*, and accompanying text.

[118] *See, e.g.,* David J. Teece, Peter C. Grindley & Edward F. Sherry, SDO IPR Policies in Dynamic Industries -- A Submission in Connection with the October 2012 National Academy of Sciences Symposium on RAND Patent Policies 30 (2012) (SDO-imposed royalty caps may induce undercompensated patent holders not to participate).

[119] *See* Contreras – Outsiders, *supra* note 28.

[120] R. Hewitt Pate, Ass't Att'y Gen., U.S. Dep't of Justice Antitrust Div., EU Competition Workshop, Competition and Intellectual Property in the US: Licensing Freedom and the Limits of Antitrust, at 9 (June 3, 2005), available at http:/ /www.usdoj.gov/atr/public/speeches/209359.pdf.

[121] *See* Gilbert, Deal, *supra* note 73, at 866-68 ("ex ante joint negotiations are likely to result in royalties per firm that are lower than the royalties that most, if not all, licensees would pay with bilateral bargaining"); Layne-Farrar et al, *supra* note 54, at 461 ("with joint ex ante negotiations the patent holder will generally be under-rewarded).

technology developers to participate in standard setting, thereby reducing the overall value of standards produced. A reduction of incentives, however, is not fatal from an antitrust perspective. As one DOJ official explains, "harm to a particular faction does not necessarily equate to harm to competition. If a particular SDO's policy would reduce the royalties obtained by a particular patentee, that is not necessarily a violation of the antitrust laws."[122] Thus, even if royalties to one or a group of SEP holders were reduced as a result of collective negotiation of such rates, an antitrust violation would not necessarily arise absent other forms of abusive conduct (e.g., coordination of downstream product prices), and would need to be considered in light of the procompetitive factors noted above.[123]

It is also important to remember that, to date, the debate regarding "joint negotiation" in the context of SEP royalties has largely focused on concerted action by potential *licensees*. That is, the central question has been whether product manufacturers and standards implementers within an SDO should be permitted to negotiate with a SEP holder regarding the rates that it will charge if its patented technology is included in a standard. If the proffered rate is too high, then the SDO members may chose a less expensive alternative, or persuade the SEP holder to lower its rate (hence the spectre of oligopsony).

But the organizational dynamic with respect to negotiation of *aggregate* SEP royalties is somewhat different. Here, manufacturers and implementers will not be negotiating with individual SEP holders, but with all SEP holders as a group. Thus, SEP holders can also form a coalition within this negotiation framework, thereby lessening the risk that they will be taken advantage of by "buyers" operating in concert. Moreover, the negotiation leverage of the buyer group in this negotiation would be less than it otherwise would be in the traditional joint negotiation setting, because, ideally, all SEP holders will be engaged on the "other side". Thus, if implementers exert too much downward pressure on the royalties sought by SEP holders *as a group*, they risk defection not only by a single SEP holder, but by *all* SEP holders. And once a significant number of SEPs become unencumbered by any licensing commitments, the success of the proposed standard in the market may be seriously compromised.

D. A Role for Agencies in Aggregate Royalty Discussions

Lawyers and engineers are by their natures cautious. As such, it may take more than law review articles to persuade SDOs to take the first steps toward authorizing aggregate royalty negotiations. Far more persuasive would be affirmative statements from relevant antitrust enforcement agencies condoning such coordinated conduct under the right circumstances. In

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[122] Gerald F. Masoudi, Deputy Ass't Att'y Gen., U.S. Dep't of Justice Antitrust Div., Antitrust Enforcement and Standard Setting: The VITA and IEEE Letters and the 'IP2' Report, Speech given at Spring Meeting of the Am. Intell. Prop. L. Assn., Boston, Mass., at 10 (May 10, 2007).

[123] *Cf.* Gilbert, Deal, *supra* note 73, at 884 (proposing that "If the risk of ex post holdup is minimal, there should be a presumption that joint negotiation is unlawful because joint negotiation can harm innovation competition by suppressing royalties. ... The presumption of illegality from joint negotiation of licensing terms can be overturned by demonstrating procompetitive benefits, such as a reduction in the transaction costs of licensing, that are likely to outweigh any competitive harm.")

order to assuage the fear of antitrust law, governmental actors can, and should, clarify the permissibility of joint negotiation of aggregate royalties within the standardization context. Such clarifications could take several forms.

First are policy documents and guidance issued directly by the agencies. Enforcement agencies such as the DOJ and FTC in the United States, the European Commission in the European Union and corresponding agencies in countries such as China, Japan, Korea, India and Canada, have all recently published guidelines regarding antitrust, patents and standards.[124] Each of these agencies could explicitly indicate that antitrust enforcement would be unlikely with respect to the negotiation of aggregate royalties for standards, absent other anticompetitive conduct.

Second, agencies may respond to requests for clarification and intent that are submitted by private parties. In the U.S. the DOJ's business review letter procedure offers a convenient and (relatively) inexpensive way for parties to obtain an early indication regarding the agency's views of a particular transaction.[125] Several such letters have already been issued in the area of voluntary consensus standardization.[126] To the extent that an SDO were considering implementing a joint negotiation approach to develop aggregate SEP royalties for its standards, it would do well to consider requesting a business review letter from the DOJ. This would provide the agency with an opportunity to clarify whether the proposed approach raises antitrust concerns.[127]

Finally, the legislature could take action in this regard. For example, in the U.S. a relatively modest amendment to the Standards Development Organization Advancement Act of 2004,[128] a statute that already offers limited antitrust immunity to SDOs, could clarify that negotiation and agreement on aggregate royalty caps in standard-setting do not constitute violations of the Sherman Act or FTC Act, absent some other anticompetitive conduct. A similar legislative approach could be taken in Europe and other countries in which antitrust, patent and standards issues are currently the subject of regulatory activity.

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[124] *See, e.g.*, DOJ/FTC ANTITRUST & IPR, *supra* note 55; FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 192 (2011); European Comm'n, supra note 62; Korea Fair Trade Comm'n., Review Guidelines on Unfair Exercise of Intellectual Property Rights (Mar. 2016); Canadian Competition Bureau, Intellectual Property Enforcement Guidelines (2015); China NDRC Guidelines on Abuse of Intellectual Property Rights under the Antimonopoly Law (Draft for Comments), Dec. 31, 2015; Japan Fair Trade Comm'n, Declaration Paper of Licensing Industrial Property Rights attached to the Operation Rules of Handling the Industrial Property Rights (2016); India DIPP Discussion Paper, supra note 70.

[125] U.S. Dep't of Justice, Business Review Procedure, 28 C.F.R. § 50.6. *See also* Hesse, *supra* note 61, at 7 ("The division's business review procedure permits industry to receive guidance from the division about activity that has not yet taken place").

[126] *See, e.g.*, DOJ 2006 VITA Letter, *supra* note 61; Letter from Thomas O. Barnett, Assistant Att'y Gen., U.S. Dep't of Justice, to Michael A. Lindsay, Esq., Dorsey & Whitney LLP (Apr. 30, 2007) (IEEE); Letter from William J. Baer, Assistant Att'y Gen., Antitrust Div., U.S. Dep't of Justice, to Garrard R. Beeney, Sullivan & Cromwell LLP (Mar. 26, 2013) (IPXI); Letter from Renata B. Hesse, Acting Assistant Att'y Gen., U.S. Dep't of Justice, to Michael A. Lindsay, Esq., Dorsey & Whitney LLP (Feb. 2, 2015) (IEEE).

[127] Such inquiries are encouraged by the agency. *See* Hesse, *supra* note 61, at 19-20 ("We encourage standards bodies that revise their patent policies to see ex ante review through our business review procedures").

[128] Pub. L. No. 108-237, 118 Stat. 661 (2004) (codified at 15 U.S.C. 4301 et seq.).

While agency and legislative action are not required for SDOs to develop and utilize aggregate royalty caps, such clarifications by authoritative governmental bodies could clear the way for SDOs to adopt such policies.

IV. CONCLUSION

Top-down methodologies for calculating FRAND royalties for patents covering voluntary industry standards are increasingly favored by courts and antitrust enforcement agencies. Yet, without significant alterations to current litigation systems in the U.S. and elsewhere, bilateral disputes between parties offer courts too little information to make informed determinations of aggregate royalty levels applicable to particular standards. As a result, the basis for allocating royalties among individual patent holders is flawed. A preferred means for determining the appropriate aggregate royalty applicable to a particular standard could be joint negotiation among SDO participants, including both patent holders and potential manufacturers of standardized products, prior to the approval of the standard. Despite the potential benefits of this approach, fears of antitrust liability have caused SDOs to avoid adopting it in their internal procedures. Several SDOs, in fact, prohibit any discussion of royalty levels as part of the SDO's proceedings. I argue that these fears are largely unfounded, a position that has been validated by antitrust enforcement agencies in both the U.S. and Europe. In the large majority of cases, the procompetitive benefits of joint negotiation of aggregate royalty levels should outweigh anticompetitive harms. The ex ante determination of aggregate royalty levels for standards would substantially facilitate bilateral negotiation of SEP license agreements and reduce the complexity and unpredictability of SEP litigation. Accordingly, it is time for antitrust enforcement agencies to be more explicit in encouraging the use of collective negotiation mechanisms to support the determination of aggregate royalty burdens on voluntary industry standards and for SDOs to step up to this important role.