

Paper Trail: Working Papers and Recent Scholarship

Editor's Note: In this edition, *Antitrust Source* editor and economist Allan Shampine of Compass Lexecon reviews a working paper, in which the authors present intriguing evidence suggesting that continuations are used opportunistically at the USPTO to, in the authors' words, "invent patents" that are infringed by already-published standards.

Send suggestions for papers to review to jwoodbury@crai.com.

—JOHN R. WOODBURY

Recent Paper

Cesare Righi & Timothy Simcoe, Patenting Inventions or Inventing Patents? Strategic Use of Continuations at the USPTO (NBER Working Paper 27686, Jan. 2021), <https://www.nber.org/papers/w27686>

Standard-setting organizations (SSOs) have for many years had something of a fraught relationship with patented technology. While SSOs can and do produce great benefits for society, it is the nature of compatibility standards that they generally involve competing manufacturers of products cooperating in certain ways to ensure that their products are compatible. That can raise a variety of antitrust concerns. One of the most commonly discussed antitrust concerns stemming from the standard-setting process is that patent-holders may be able to exploit the cooperative standard-setting process to extract excessive patent royalties from standards implementers. When a patent is necessarily infringed by compliant implementations of an industry standard, it is called "essential." Essential patents can be valuable to their owners, both because a successful standard reduces competition from substitute technologies, and because it can be easier to prove infringement by comparing the product to a public standard, rather than trying to reverse engineer a competitor's product. Thus, while SSOs may have good reasons to include a patented technology in an industry standard, doing so can place the patent owner in a very strong bargaining position if the standard succeeds.¹ Patent-holders therefore have incentives to see their patented technologies incorporated into standards.

However, there are also concerns that this practice sometimes works in reverse—with firms attempting to patent elements of a standard after the standard has been set. For example, practitioners have long discussed anecdotal evidence that some patent-holders would adapt their patent filings to more closely match, or even outright copy, the language of a standard, thus helping to build the case that the patent is essential to the standard. Such behavior could exacerbate antitrust concerns about standard-setting and hold-up or even raise additional antitrust concerns.

This sort of ex post modification can occur through the practice of continuations, which "allow applicants to tailor their patent claims to cover products and technologies developed by others

¹ For further discussion, see Timothy Simcoe & Allan Shampine, *Economics of Patents and Standardization: Network Effects, Hold-up, Hold-out, Stacking*, in THE CAMBRIDGE HANDBOOK OF TECHNICAL STANDARDIZATION LAW: COMPETITION, ANTITRUST, AND PATENTS (Jorge L. Contreras ed., 2018).

after an invention is disclosed.”² Indeed, researchers for years have documented examples of opportunistic use of continuations in a variety of areas, not just with SSOs.³ Despite the anecdotes and research, however, the authors note that “there is little statistical evidence on the opportunistic use of continuations.”⁴ They attribute this to two reasons. First, it can be difficult to link patents to potentially infringing technologies. Second, it can be difficult to identify milestones after which incentives to behave opportunistically occur.

The authors address both problems by focusing on standard setting generally, and on information and communications technology specifically. Several large SSOs encourage or require participants to disclose patents that might be infringed by a proposed standard. The disclosure requirements of these SSOs provide a group of patents where opportunistic behavior might be expected, and the publication of the standard itself provides a point in time after which opportunistic behavior might be expected to increase. The authors do not look only to standard-essential patents (SEPs). The vast majority of the SEPs in their data set were examined by the Computers and Communication centers of the USPTO. The authors therefore take the non-SEP applications examined by those centers as a control group.

To a large degree, the story of the paper lies in a simple comparison between the SEP and non-SEP filings. SEP filings are much more likely to be continuations than non-SEP filings, and a majority of SEP filings are made *after* the relevant standard is finalized. The authors provide a range of statistical tests that support this intuition. While interesting, some of the supporting work is perhaps of even greater interest to practitioners, as it provides some innovative approaches in a couple of areas that could easily be applied in other contexts.

In particular, the authors tackle the concept of patent examiner leniency in a quantitative manner. There has been prior research that there are large differences in patenting outcomes depending on the assigned examiner. Those differences can be addressed in a statistical analysis in a number of ways, such as using fixed effects by examiner. However, in addition to that kind of approach, the authors introduce a quantitative measure of leniency that appears to be new to the literature. To come up with this measure, the authors take advantage of the fact that the number of independent claims in a patent typically declines from the initial filing as the examiner disallows some of them. While the degree to which original claims get cut will vary for many reasons from patent to patent, the authors suggest that on average, across a large number of patents, if one examiner consistently cuts more claims than another, the difference between the two examiners can be taken as a difference in “leniency.”⁵ They thus create a numeric measure of “leniency” by comparing the average difference between the number of independent claims at issuance and at publication. This idea of using a numerical measure of leniency as a control variable is quite interesting independent of its application here, and the idea could be fruitfully applied in other contexts.

Here, the authors find that after a standard is finalized, the increase in continuation filings is larger for SEPs assigned to more lenient examiners. They claim that the evidence suggests applicants do gain knowledge and wait to take advantage of lenient examiners until they have better

² Cesare Righi & Timothy Simcoe, *Patenting Inventions or Inventing Patents? Strategic Use of Continuations at the USPTO* (NBER Working Paper 27686, Jan. 2021).

³ *Id.*

⁴ *Id.*

⁵ The authors provide an alternative measure of leniency based on examiners’ leave-one-out grant rates and obtain similar results using that variable.

information on the content of the standard, i.e., after the standard has been finalized. There does appear to be some relationship present, but the mechanism and causality are not so clear to this writer. Nonetheless, it is an interesting finding, and one that invites further research.

As the authors note, the interpretation that applicants use continuations opportunistically is, in the statistical work, largely based on timing, i.e., that one might expect more continuations after a standard is set if firms were engaging in opportunistic behavior.⁶ The authors supplement this temporal test by looking at features of the continuations themselves. To begin with, the authors attempt to distinguish between opportunistic continuations and non-opportunistic continuations by looking at a particular kind of rejection—a double-patenting rejection. These are used if a claim is “patentably indistinct” from a previous application, and the authors suggest it is a useful proxy for “claim broadening” or “claim tailoring” continuation applications, as opposed to continuations that claim new and distinct uses of the original invention.⁷ That is, the authors suggest that if many post-standard-setting continuations for SEPs are intended to tailor the patent language to better match the standard, then one might expect to see a larger fraction of rejections be due to double-patenting concerns. In fact, they find that to be the case.

Finally, the authors look to the patent application language over time to see if there is any convergence after a standard is set. As noted earlier, practitioners have discussed anecdotal evidence of continuations copying language from standards but analyzing such claims on a systematic basis is challenging. One could simply take the patent applications before and after the standard is set and compare the language with that of the finalized standard, either by hand or using some statistical methodology for language similarity. At least one working paper has attempted something like this based on automated text matching,⁸ but, as the authors note, this approach is time consuming and difficult. Rather than compare the standard itself to the patent application language before and after the standard is finalized, the authors identify pairs of patents related to the same standard, and see if the language in the patents’ applications converges after the standard is finalized.

The authors assume that if the patents are consistently being adjusted to more closely adhere to the standard language, then separate patents related to the same standard should also become more similar. They find that, in fact, post-standard-finalization continuations do look more similar across patents related to that standard than before finalization.⁹

However, while this approach has the benefit of being easier to implement than comparing the actual standards’ language with the patent applications’ language, it is also an indirect approach. One can imagine situations where two patents related to the same standard might not converge, such as if they were related to two different parts of a lengthy standard. They might even diverge relative to one another rather than converge, even if both actually copied the exact language of the standard. It is also conceivable that the patents might converge even without opportunistic behavior. For example, certain key terms might come into more common use simply because of evolution in the industry.

Thus, while convergence of language between patents after finalization of a standard is suggestive, some caution should be exercised in interpreting the results. Indeed, it would be very

⁶ Righi & Simcoe, *supra* note 2, at 21.

⁷ *Id.* at 22.

⁸ Lorenz Brachtendorf, Fabian Gaessler & Dietmar Harhoff, Approximating the Standard Essentiality of Patents—A Semantics-Based Analysis, 12th Searle Conference on Innovation Economics (June 4, 2019), [gaessler_approximating_standard_essentiality.pdf](#).

⁹ “Similar” here has a particular meaning. The authors use a Jaccard index, which equals the number of common keywords in the claims of the two applications divided by the number of total keywords, multiplied by 100. Righi & Simcoe, *supra* note 2, at 24.

interesting to see further research on the reliability of this method. One way to test its reliability would be to take the same sample, or even a subset of the sample, and add comparisons to the actual language of the standards. That is, if this method shows that two patents have converging language, are they also converging with the language of the standard itself? Conversely, are there examples where the language of the paired patents converges, but that language does not converge with the standard?

Overall, the authors present intriguing evidence suggesting that continuations are used opportunistically to, in the authors' words, "invent patents" that are infringed by already-published standards.¹⁰ However, the paper is as notable for data and methodological innovations that may be of use in other scholarship related to patents. In particular, their insights into how to quantify examiner "leniency" or to engage in textual comparisons across patents and across time in a relatively tractable way are of great interest to practitioners and suggest a number of interesting areas for future research. ●

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¹⁰ *Id.* abstract.