



ANTITRUST POLICY TOWARD TECHNOLOGY STANDARDS



*By Daniel F. Spulber*¹

I. INTRODUCTION

What should be antitrust policy toward technology standards? Antitrust policy makers agree that standard setting organizations (“SSOs”) and technology standards provide significant economic benefits. However, antitrust authorities also express concerns that technology standards pose a competitive problem because they allegedly give market power to owners of Standard Essential Patents (“SEPs”). Thus, antitrust authorities appear to find a conflict between antitrust policy and technology standards, at least where patents are involved.

This article argues that there is not a conflict between antitrust policy and technology standards. A better understanding of the economic role of technology standards suggests that standard setting increases competition in product markets and markets for inventions. SSOs and technology standards are vital for entrepreneurs seeking to apply new technologies and to establish innovative firms. This implies that antitrust authorities should view antitrust policy and technology standards as complementary.

¹ Elinor Hobbs Distinguished Professor of International Business, Professor of Strategy, 606 Jacobs, Kellogg School of Management, 2001 Sheridan Road, Northwestern University, Evanston, IL 60208. E-mail: jems@kellogg.northwestern.edu. I thank the Ewing Marion Kauffman Foundation and Qualcomm for research grants. All opinions expressed are solely those of the author.



Antitrust policy should be based on a realistic view of the market for inventions and economic institutions. The concerns expressed by antitrust authorities about SEPs often are based on inaccurate pictures of patent licensing and the standard setting process. Patent licensing typically involves bargaining rather than posted prices. Economic analysis shows that bargaining over license royalties blocks standard antitrust concerns about SEP holdup, royalty stacking, patent thickets and the Tragedy of the Anticommons.²

In addition, standard setting typically involves voting by SSO members. Economic analysis shows that voting procedures tend to result in efficient technology standards.³ The interaction between technology standards and patents strengthens the pro-competitive effects of standards.

Standards aside, antitrust authorities have come to recognize that antitrust policy and protections for intellectual property (“IP”) are complementary. Antitrust authorities should recognize that antitrust policy toward technology standards and maintenance of strong IP rights also are complementary. Economic analysis implies that antitrust policy makers should consider the important contributions of technology standards to competitive markets. Accordingly, antitrust policy makers should exercise forbearance toward technology standards and SEPs.

II. DO STANDARDS CREATE MONOPOLY?

The key question is whether or not technology standards create monopolies for SEP owners. Antitrust authorities have expressed the concern that standard setting gives undue market power to owners of SEPs. FTC Chairwoman Edith Ramirez observes: “In the standard-setting context, the risk of patent hold-up creates the type of competitive harm that falls properly within the scope of antitrust enforcement.”⁴ The European Commission expresses similar views about market failure in licensing SEPs.⁵ These concerns are misplaced for a number of important reasons.

These concerns about SEPs recall the common but incorrect belief that any patent creates a monopoly. This view is inaccurate because patents do not limit access to markets and so do not create economic monopolies. Patents limit the usage of new technologies thus

² Daniel F. Spulber, Patent Licensing and Bargaining with Innovative Complements and Substitutes, *Research in Economics*, September 2016, 70, 3, <http://dx.doi.org/10.1016/j.rie.2016.08.004>.

³ Daniel F. Spulber, Standard Setting Organizations and Standard Essential Patents: Voting Power versus Market Power, Kellogg School of Management, Working Paper, Evanston, IL, Revised, March, 2016.

⁴ Edith Ramirez, Standard-Essential Patents and Licensing: An Antitrust Enforcement Perspective, Address by FTC Chairwoman Edith Ramirez, 8th Annual Global Antitrust Enforcement Symposium Georgetown University Law Center Washington, DC, September 10, 2014.

⁵ European Commission, 2014, *Patents and Standards: A modern framework for IPR-based standardization, A study prepared for the European Commission Directorate-General for Enterprise and Industry*, <http://ec.europa.eu/DocsRoom/documents/4843/attachments/1/translations>, Accessed August 12, 2016 (“The licensing of such standard essential patents (SEPs) is however prone to market failures such as externalities (positive and negative), information problems, market power and free-riding. The various forms of market failure can result in barriers obstructing the efficient licensing of SEPs and can thus hinder the realization of the economic and societal benefits of the affected standards.” at 9).



allowing inventors to obtain returns to their inventions, to apply their inventions and to transfer technologies to innovators. Patents serve to promote competition, not only in the market for inventions but in markets for goods and services as well.

Patents are property rights that allow technology providers and adopters to transact more efficiently. Patents provide standardization and market information that lowers transaction costs in the market for inventions.⁶ Patents help IP owners coordinate with innovative producers.⁷ Patents provide many of the important economic functions associated with other forms of property rights. Lower transaction costs mean more efficient markets and thus more competition. Patents help entrepreneurs develop startups and establish innovative firms.

Patents also support the “market for innovative control,” a term used to describe how property rights in technology help in the development of innovations based on that technology.⁸ The market for the transfer of technology is not just a mechanism for allocating *returns* from inventions. Instead, the market is a mechanism for allocating the *control* of inventions, allowing inventors to affect innovative decisions. Just as the stock market is a market for the control of corporations, the market for inventions is a market for the control of innovations based on patented inventions. More effective innovations generate dynamic efficiencies and promote entrepreneurship and competition.

Patents also are very useful for financing invention, innovation and entrepreneurship.⁹ Patents allow inventors to license or transfer their inventions to others, helping to finance their inventions. Patents allow innovators to raise capital to support their projects. Finally, patents provide help to entrepreneurs in financing and growing new ventures. In this way, patents strengthen the financing of technological change, thus further promoting competition.

These three factors – lowering transaction costs, supporting the market for innovation control and financing invention and innovation – demonstrate that patents are pro-competitive. In turn, greater competition stimulates invention and innovation, whether there is competition among inventors or among technology adopters.¹⁰ Patents stimulate invention, innovation and entrepreneurship. This is why antitrust enforcement and protection for IP rights are complementary.

One of the antitrust issues raised by critics of technology standards is that SEPs create monopoly power for IP owners. The argument is that prior to setting standards, a greater number of patents compete in the market for inventions. After a standard is established, the argument goes, the number of competing patents goes down, thereby generating monopoly rents for the owners of patents that read on the standard.

⁶ Daniel F. Spulber, How Patents Provide the Foundation of the Market for Inventions, *Journal of Competition Law and Economics*, 2015, 11(2): pp. 271-316.

⁷ F. Scott Kieff, Coordination, Property, and Intellectual Property: An Unconventional Approach to Anticompetitive Effects and Downstream Access, *Emory Law Journal*, 2006, 56, pp. 327-438.

⁸ The term “market for innovative control” is introduced in Spulber, 2015, id.

⁹ Spulber, 2015, id.

¹⁰ Daniel F. Spulber, How Do Competitive Pressures Affect Incentives to Innovate when there is a Market for Inventions?, *Journal of Political Economy*, 2013, 121(6): 1007-1054.



This argument is an oversimplification of market institutions; it is a basic numbers game that does not accurately describe markets. Elsewhere, I refer to this view as the “standards-conduct-performance” paradigm.¹¹

The “standards-conduct-performance” paradigm is reminiscent of the old antitrust view known as the “structure-conduct-performance” paradigm. That view was that simply knowing how many firms were in a market was enough to predict competitive conduct and economic performance of that market. In short, few firms meant monopoly and many firms meant competition. This characterization was eventually rejected because evidence showed that simply counting firms did little to predict the strength of competition. In practice, competitive entry, entrepreneurship and innovation improved market performance over time. Just counting firms did not accurately describe competition.

The “standards-conduct-performance” paradigm is a similar misconception. Simply counting patents does not accurately describe competition. Companies may declare their patents to be SEPs and these patents may be incorporated in the standard. Patents declared to be SEPs need not be technologically essential. They may compete against other SEPs or alternative technological solutions. Companies involved in standard setting often develop new technologies in response to opportunities and information generated by the standard-setting process. These patented technologies compete in the market for inventions. The extent of competition in the market for inventions depends on innovation and entry, rather than the number of SEPs.

Even if standards do restrict the number of technologies to be included in the standard at a particular time, it does not mean that future inventions and innovations are reduced. The result of standards can be more inventions, greater innovation and increased entrepreneurship in response to standardization. Standardization increases demand for final products and thus generates returns to invention and innovation. Standardization can increase incentives to invent and to innovate.

Greater incentives to invent and to innovate imply that standards do not create monopoly. Standards do not restrict access to markets and are not a barrier to entry. Standards created by SSOs are freely available to market entrants. There can be multiple standardized products that compete in the marketplace. There can be multiple technologies that are applied to design and manufacture products conforming to a standard. There can also be multiple standards that compete in the marketplace. For these and other reasons, just counting patents does not describe the dynamics of competition.

III. LICENSING SEPs

Many of the concerns expressed about SEPs are due to a mischaracterization of patent licensing. These concerns generally are developed by theoretical economic analyses with a common source: Cournot’s complementary monopolies model from 1838. In that model, monopoly sellers of complementary inputs independently choose input prices such that total

¹¹ Daniel F. Spulber, Innovation Economics: Technology Standards, Competitive Conduct and Economic Performance, *Journal of Competition Law and Economics*, 2013, 9 (4), pp. 777-825, doi:10.1093/joclec/nht041.



input prices are greater than what would be charged by a monopolist selling the bundle of inputs. The reason for Cournot's famous result is that input sellers are free riders; they do not recognize that increasing their prices diminishes the returns to other input sellers. The lack of coordination, either explicit or implicit, results in inefficiently high prices. Input suppliers and producers are made worse off in comparison to a monopoly selling the bundle of inputs.

This reasoning has been frequently applied to the study of SEPs. The idea is that patent owners are free riders; they increase patent royalties without recognizing that increasing royalties diminishes the returns to other patent owners. Producers that license patents are made worse off in comparison to what they would pay to a monopoly IP owner licensing the bundle of inventions.

On the basis of the Cournot model, economists have raised a variety of concerns. First, they suggest that "SEP holdup" may occur, with patent owners asking high licensing royalties for technologies already in use that satisfy the standard. Second, they suggest that total royalties will exceed the monopoly level, a problem known as "royalty stacking." Third, they suggest that a lack of coordination between producers and many owners of SEPs will deter innovation and the development of standardized products, a problem referred to as "patent thickets." Fourth, they suggest that patents in general and SEPs in particular will generate excessive entry of patent owners to the point where production is discouraged, a problem referred to as the "Tragedy of the Anticommons."

Because all of these problems have a common source, it is necessary to ask whether the Cournot model generates accurate predictions. The problem with the Cournot approach is that it is based on an inaccurate description of market institutions. The Cournot approach to patent licensing presumes that patent owners use posted prices. In practice, however, patent owners negotiate licenses with technology adopters. Bargaining over license royalties is an important feature of the market for patent licensing.

The question is whether a proper description of the market institutions makes a difference in describing market outcomes. Bargaining does indeed lead to very different predictions in comparison to posted prices. In particular, bargaining between IP owners and technology adopters addresses the free rider problem. Bargaining between IP owners and technology adopters results in joint profit maximization.

With bargaining, total royalties are *less than* what a monopoly IP owner would charge for the bundle of inventions.¹² Bargaining between IP owners and technology adopters eliminates antitrust concerns that are based on posted prices. In particular, bargaining over patent licenses blocks problems such as SEP holdup, royalty stacking, patent thickets and the Tragedy of the Anticommons.¹³

Hypothetical concerns such as SEP holdup are inconsistent with observed market institutions. This helps explain why alleged problems with SEPs are rarely if ever observed in practice. It follows that SEP holdup and related issues should not be the basis for antitrust policy toward technology standards. Because of the importance of bargaining, concerns about

¹² Spulber, 2016, *supra* note 2.

¹³ Spulber, 2016, *supra* note 2.



SEP holdup also should not be used to alter SSO policies toward IP.¹⁴

Despite hypothetical fears about SEPs, standardized products are produced routinely in a variety of industries, including information and communications technology (“ICT”). Complex innovations conforming to standards incorporate many inventions, including SEPs. The extensive use of bargaining in patent licensing helps IP owners and technology adopters effectively coordinate their activities.

IV. SSOs AND THE EFFICIENCY OF TECHNOLOGY STANDARDS

There is another important institutional aspect of standard setting that makes a difference in understanding how standards work. SSOs generally establish technology standards through voting. The interaction among members of SSOs requires multiple meetings, exchange of information and discussion of alternatives. Voting plays an important role in the selection of standards.¹⁵

Voting in SSOs has implications for the economic performance of standard setting. Voting helps SSOs choose economically efficient technology standards.¹⁶ Concerns about the market power of SEP owners are offset by the voting power of industry members that participate in SSOs.¹⁷

Antitrust restrictions on SSO activities and on licensing of SEPs would limit private coordination both in the SSOs themselves and in the market for inventions.¹⁸ Antitrust pressures that restrict SSO policies could reduce competition and innovation. As Ron Katznelson explains, Institute of Electrical and Electronics Engineers policy changes will lead to problems when new standards incorporate older standards or standards established by other SSOs, which could reduce efficiencies in innovation.¹⁹

Antitrust policies that restrict SSO policies on IP would reduce the effectiveness of standards. Such policy changes could diminish incentives to participate in standard setting or to include patented inventions in standards.

V. CONCLUSION

Technology standards are fundamental for the development of inventions and their application

¹⁴ Ron D. Katznelson, *Perilous Deviations from FRAND Harmony – Operational Pitfalls of the 2015 IEEE Patent Policy*, IEEE SIIT 2015, 9th International Conf. on Standardization and Innovation in Information Technology, Sunnyvale, CA. (Oct-8-2015).

¹⁵ For data on SSOs, see Justus Baron and Daniel F. Spulber, *Technology Standards and Standard Setting Organizations: The Searle Center Database*, Searle Center on Law, Regulation, and Economic Growth, Working Paper, Revised August, 2016.

¹⁶ Spulber, 2016, *supra* note 3.

¹⁷ Spulber, 2016, *supra* note 3.

¹⁸ Richard Epstein, F. Scott Kieff, Daniel F. Spulber, *The FTC, IP, and SSOs: Government Hold-Up Replacing Private Coordination*, *Journal of Competition Law and Economics*, March 2012, Volume 8, Issue 1, pp. 1-46. doi: 10.1093/joclec/nhs002.

¹⁹ Katznelson, 2015, *supra* note 14.



to innovations. Standardization has provided extensive efficiencies to practically every industry. Technology standards are valuable in reducing transaction costs and helping industries coordinate their activities.

Technology standards also are important as means of improving production methods, transaction techniques and final products. Technology standards will only increase in importance with the continued development of network-based innovations, including the “Internet of Things” and extensions of the “Sharing Economy.”

Entrepreneurs are vital in the application and development of innovations.²⁰ SSOs help their members exchange information about new technologies and the specifications necessary for interoperability. Technology standards and SSOs are very helpful to entrepreneurs seeking to learn about and apply new technologies developed by others. SSOs also are important institutions because the standard setting process helps members determine what technologies to develop and helps members disseminate information about new technologies. This implies that SSOs provide important benefits to entrepreneurs in their efforts to establish firms that provide innovations to industries. Technology standards thus help foster competitive entry.

Antitrust policy toward technology standards should be well grounded in an understanding of private institutions such as SSOs and market institutions such as bargaining over patent licensing. The economic contributions of SSOs and technology standards depend on effective IP rights, including SEPs. Antitrust policy objectives in promoting competition and increasing consumer welfare are complementary to an effective system of technology standards.

²⁰ Daniel F. Spulber, *The Innovative Entrepreneur*, 2014, Cambridge: Cambridge University Press.