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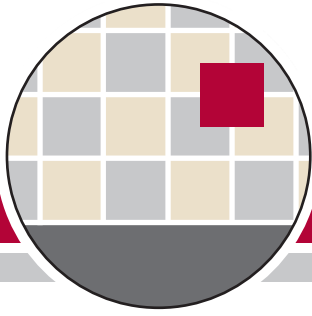
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Markets for Patent Scope

Ted Sichelman*

Abstract: A recurring issue in intellectual property theory is how the scope of patent rights affects invention and commercialization. Traditionally, there has been a dichotomous debate: one view stemming from Ed Kitch, promoting broad “prospect”-style patents in the hands of a single inventor, and another view from Robert Merges and Richard Nelson, advocating relatively narrow scope to encourage competition in innovation. More recently, a variety of scholars have set forth more nuanced positions. My thesis here is that the variance in these views can be traced to differing empirical attitudes about how well the market functions relative to a patent system in promoting invention, commercialization, and coordination among market actors in the R&D process. By investigating these empirical differences, scholars can more rigorously address a number of important issues not fully examined by the literature, such as the cumulative nature of technology commercialization (not just invention), the tailoring of patent scope by industry, collaborative innovation, and the decoupling of patent rights to separately address invention and commercialization incentives.

A long-standing question in IP scholarship is how the patent system should optimally balance the rights of an initial, pioneering inventor and follow-on inventors who improve upon the initial invention. Surprisingly, this critical issue was not fully recognized until two seminal articles emerged—one by Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*,¹ and the other by Robert Merges and Richard Nelson, *On the Complex Economics of Patent Scope*.² The insights of these works, particularly as to how patent scope affects cumulative innovation, have been extensively recounted. However, the literature has failed to address an important shortcoming in these articles: their failure to account for another follow-on activity, the commercialization of the initial invention into a product or method suitable for use by consumers.³ In this brief essay, I focus on Merges and Nelson’s article to illustrate my point, as well as to make a broader claim that scholarly views about patent scope boil down to empirical assumptions about how

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1. Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSP. 29, 29 (1991).

2. Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 873 (1990).

3. See Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 382-83 & n.245 (2010) (recounting how the literature has failed to address the effects of patent scope on commercialization).

well the market functions to drive invention and commercialization, as well as to coordinate R&D among disparate market actors.

More than a decade before *Merges and Nelson's* article, Ed Kitch tackled commercialization concerns in his landmark article, *On the Nature and Function of the Patent System*.⁴ Kitch argued that by granting broad patent rights early in the inventive process, a single patent holder could effectively coordinate post-invention development and commercialization efforts undertaken by others.⁵ This approach reduces potential costs of duplication in the R & D process, and—importantly, for the argument here—prevents third parties' use of unpatentable information generated during the development and commercialization process.⁶ Kitch argued that his “prospect theory”—which analogized the granting of patents to the allocation of mining rights—would optimally insure against commercialization risk and costs, promoting the investment needed to make and sell products in the marketplace.⁷

Merges and Nelson take issue with Kitch's preference for a single firm to control the innovation process surrounding a given prospect, or technological opportunity, via broad patent rights.⁸ First, relying on early forms of behavioral economics, they argue that a single firm is often sluggish, and will not capitalize on every profitable opportunity to develop a technological prospect.⁹ In this regard, they contend that the analogy of mining or fishing rights is inapt,¹⁰ because there is generally no single, known prospect that inventors seek out—rather, each inventor will view a technological problem differently, arriving at various solutions, which will promote more diverse kinds of innovation.¹¹ Second, while the prospect patent holder could theoretically bring many minds to bear on any given technological problem, steep transaction costs—particularly in coordinating the licensing of patent rights among many actors—will generally diminish the holder's ability to do so.¹² Because of these reasons—which *Merges and Nelson* back up with a host of short case studies—Kitch's prospect-style patents will

4. Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265 (1977).

5. See Kitch, *supra* note 4, at 276-80.

6. See *id.* at 276-278.

7. See *id.* at 269; see also Joshua S. Gans & Scott Stern, *The Product Market and the Market for “Ideas”: Commercialization Strategies for Technology Entrepreneurs*, 32 RES. POL'Y 333, 348 (2003) (“[IP protection] allows for cooperation between start-ups and incumbents who might otherwise view innovation purely as a competitive threat.”). Recent empirical research lends support to Kitch's thesis. For example, a cross-industry empirical study found that firms lacking specialized complementary assets were, in the presence of strong patent protection, more likely to license their innovations than compete in the market—arguably, a relatively efficient outcome. See Asish Arora & Marco Ceccagnoli, *Patent Protection, Complementary Assets, and Firms' Incentives for Technology Licensing*, 52 MGMT. SCI. 293 (2006).

8. See *Merges & Nelson*, *supra* note 2, at 871-78.

9. See *id.* at 872-73.

10. See Kitch, *supra* note 4, at 265-66 (citing Yoram Barzel, *Optimal Timing of Innovations*, 50 REV. ECON. & STAT. 348 (1968) (analogizing the development of technological information to fisheries, public roads, and other common resources)).

11. See *Merges & Nelson*, *supra* note 2, at 873.

12. See *id.* at 874.

often grant too broad protection for optimal technological development. As such, Merges and Nelson contend that a theory of cabined patent scope is more suitable.

Merges and Nelson's critique of Kitch is incisive and has been cited widely in later scholarship.¹³ But Merges and Nelson obscure an important distinction in Kitch's work—that between reducing duplicated development costs through coordination and promoting optimal commercialization of a given invention.¹⁴ Merges and Nelson essentially focus on the first aspect of prospect theory, mostly ignoring Kitch's concerns about commercialization.¹⁵ So while Merges and Nelson may have convincingly cast doubt on the value of broad patents in spurring follow-on development and invention, they said nearly nothing about the effects of such patents on commercialization. Following upon Merges and Nelson, later scholars have generally taken the same tack, treating prospect theory as solely concerning the improvement of initial invention, rather than commercialization.¹⁶ Indeed, at the symposium associated with this volume, Merges admitted that his and Nelson's article perhaps unfairly characterized prospect theory in this manner.¹⁷

This distinction between follow-on invention and post-invention commercialization is not just semantic. Specifically, follow-on invention is technological in nature, and—if sufficiently innovative—is protectable by additional patent rights. Commercialization efforts, however, often involve non-technological activities, including market research to assess which product features are most desirable as well as to determine optimal pricing and sales techniques, and build a consumer market by generating sufficient product demand.¹⁸ These activities are generally not protectable by intellectual property and, thus, are subject to free riding.¹⁹ By providing strong patent rights, however, as Kitch recognized, “the patent owner has an incentive to make investments to maximize the value of the patent without fear that the fruits of the investment will produce unpatentable information appropriable by competitors.”²⁰ Thus, by focusing on follow-on technological—instead of commercialization—efforts, Merges and Nelson unfairly intensify the thrust of their counter-attack.

13. See, e.g., John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439, 441-42 (2004); Tim Wu, *Intellectual Property, Innovation, and Decentralized Decisions*, 92 VA. L. REV. 123, 133 (2006).

14. See Merges & Nelson, *supra* note 2, at 878-79.

15. Similarly, Scotchmer's model of “cumulative innovation” implicitly assumes that the invention process always produces a commercial “good” that may be immediately distributed, thereby abstracting away from the critical step of post-invention development and commercialization. See SUZANNE SCOTCHMER, *INNOVATION AND INCENTIVES* 37-39, 243-44 (2004).

16. See, e.g., Jonathan M. Barnett, *Cultivating the Genetic Commons: Imperfect Patent Protection and the Network Model of Innovation*, 37 SAN DIEGO L. REV. 987, 1007 (2000); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 1047 (1997).

17. See Audio recording: Patent Scope Revisited: Merges & Nelson's “On the Complex Economics of Patent Scope,” 20 Years After, held by the Indiana University-Bloomington Maurer School of Law (Sept. 23-24, 2010) (on file with the Maurer School of Law).

18. See Sichelman, *supra* note 3, at 352, 360.

19. See *id.*

20. Kitch, *supra* note 4, at 276.

But I cannot entirely fault Merges and Nelson for taking such an approach. Like most IP scholars, they are “commercialization optimists” in the sense that they believe the market will optimally provide for the commercialization of inventions absent patent protection.²¹ In other words, inventions are commercial products “out of the box,” and any further work necessary to dress up the product for sales and distribution will be taken care of by unprotected markets.²² On this view, the only reason we afford any sort of patent protection after the invention is completed is to sufficiently recompense the inventor for his efforts and investment undertaking *prior* to filing for a patent.²³ If the government, for instance, could somehow determine the optimal payment *ex ante* to induce invention, then patents would be unnecessary. Instead, after appropriate payment to the inventor, an invention otherwise suitable for patenting would be dumped into the public domain, after which any third party could come along and commercialize the invention by transforming it into a consumable product or method.²⁴

More generally, Merges and Nelson differ from Kitch in their underlying assumptions about how well the market incentivizes certain innovative activity. Although Merges and Nelson are commercialization optimists, they are invention market pessimists in the sense that they believe patents are often necessary to afford invention in the first instance, particularly for pioneering inventions. And, finally, they are patent “coordination” pessimists because they believe patents will tend to hinder coordination in R&D among multiple market actors.²⁵ Kitch, on the other hand, is exactly the opposite—a commercialization pessimist, invention optimist, and coordination optimist. Ultimately, Merges and Nelson seem to differ from Kitch not so much in their utilitarian theoretical lens on the patent system, but rather on their views of how the underlying empirical mechanics of the patent system function in an embedded market.

Traditionally, Kitch’s and Merges and Nelson’s work has created a long-standing dichotomy between a strong, property rights-oriented and a weaker, governance-centered vision of patent law.²⁶ But, more recently, several scholars have tread different paths. Perhaps the first divergence was Scott Kieff’s insightful work, *Property Rights and Property Rules for Commercializing Inventions*.²⁷ Drawing upon Kitch’s espousal of broad patent rights, Kieff

21. See Sichelman, *supra* note 3, at 358-59; see also Mark A. Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129, 129-30 & n.2 (2004); Robert P. Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CAL. L. REV. 805, 807 (1988).

22. See Sichelman, *supra* note 3, at 358-59.

23. See Lemley, *supra* note 21, at 129-31.

24. Cf. Steven Shavell & Tanguy van Ypersele, *Rewards Versus Intellectual Property Rights*, 44 J.L. & ECON. 525, 529 (2001) (assuming that the result of “research” is an “innovation,” such that if the “innovation” were made freely “available to competitors” that it would “sell at marginal cost”).

25. See Merges & Nelson, *supra* note 2, at 908-909.

26. See Henry E. Smith, *Intellectual Property as Property: Delineating Entitlements in Information*, 116 YALE L.J. 1742, 1745-46 (2007) (contrasting “exclusion” with “governance” policy strategies in intellectual property law).

27. F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 707-08 (2001).

argues that strong, real property-like protection “is necessary to facilitate investment in the complex, costly, and risky commercialization activities required to turn nascent inventions into new goods and services.”²⁸ Yet, unlike Kitch, Kieff is less sanguine about patents as tools for reducing duplicated development costs (so-called “rent dissipation”) via control of a technological prospect by a single actor; instead, he promotes the ability of patents to coordinate activities across multiple, complementary actors during the commercialization process.²⁹ Moreover, Kieff is even less concerned than Kitch about the role of patents in spurring invention.³⁰

Michael Abramowicz and John Duffy are—like Kitch and Kieff—commercialization market pessimists, particularly regarding the ability of the market to promote market experimentation for innovative products.³¹ Yet, Abramowicz and Duffy are not so quick as Kitch and Kieff to dismiss invention concerns.³² Similarly, Chris Cotropia analyzes how the timing of patent filing affects commercialization incentives, yet he does not downplay invention incentives, nor does he promote patents as coordinating tools.³³ In my own work, I have been quite sympathetic to the general approach of these “ex post” theories but adopt a slightly different stance. Like Kieff, I do not view patent law as particularly important to spurring inventive activity, but like Cotropia, I think large transaction costs are likely to prevent patents from being terribly effective in reducing duplicated development costs.³⁴

Other scholars use Merges and Nelson as their starting point, but stretch to different extremes. James Bessen and Michael Meurer, in their popular book, *Patent Failure*, are market optimists for invention and commercialization—at least in the sense that they contend patents (outside of biotech and pharma) result in net social losses—and are skeptical that

28. *Id.* at 703; see also Atul Nerkar & Scott Shane, *Determinants of Invention Commercialization: An Empirical Examination of Academically Sourced Inventions*, 28 STRAT. MGMT. J. 1155, 1157 (2007) (“Broader scope protection increases the likelihood that any trial-and-error efforts that are necessary to develop new products and services will result in something for which returns can be appropriated because broader patent scope allows the firm exploiting the invention to explore product and service applications over a wider range of technical areas.”); *id.* at 1162 (finding that inventions covered by patents with broader scope were more likely to be commercialized); Scott Shane, *Technological Opportunities and New Firm Creation*, 47 MGMT. SCI. 205, 215 (2001) (finding in an empirical study of MIT patents that ones with broader “scope,” defined as the number of international classes assigned to the patent, were “more likely to be commercialized through the creation of new firms”).

29. See F. Scott Kieff, *Coordination, Property, and Intellectual Property: An Unconventional Approach to Anticompetitive Effects and Downstream Access*, 56 EMORY L.J. 327, 405-06 (2006).

30. See *id.* at 328.

31. See Michael Abramowicz & John Duffy, *Intellectual Property for Market Experimentation*, 83 N.Y.U. L. REV. 337 (2008).

32. See, e.g., Michael Abramowicz & John Duffy, *The Inducement Standard of Patentability*, 120 YALE L.J. (2011) (forthcoming), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1694883.

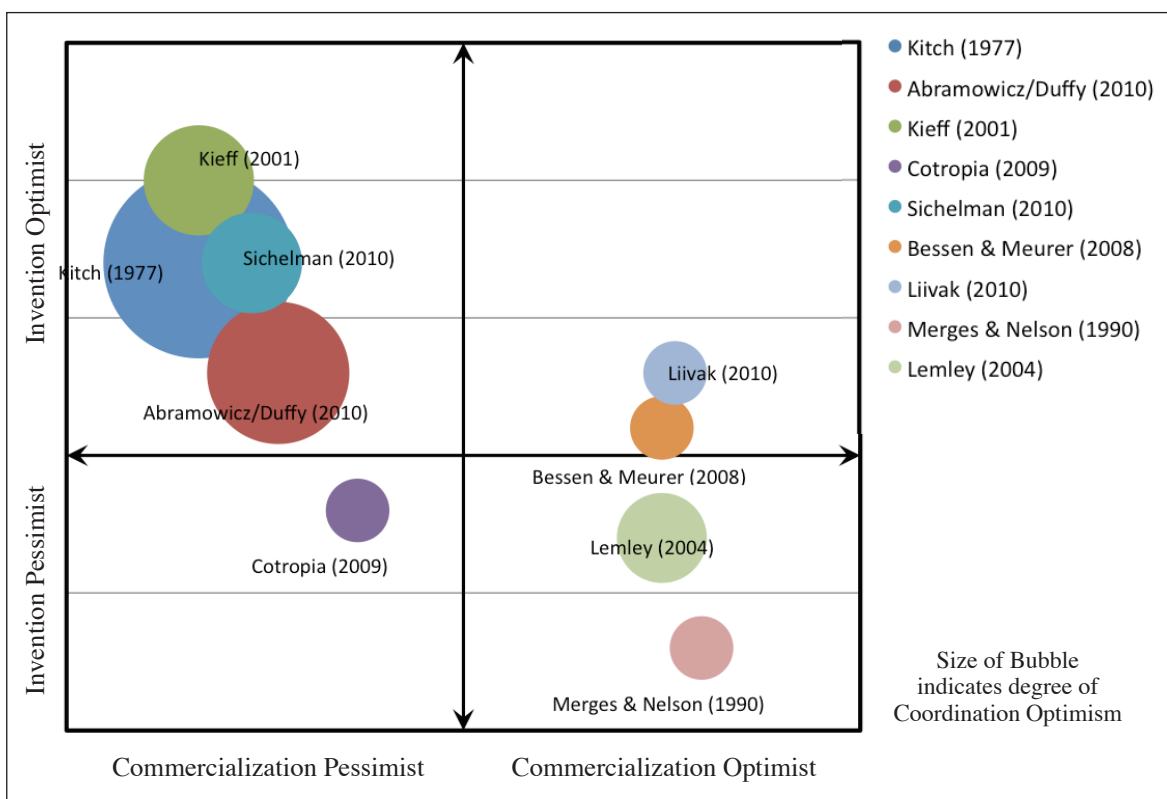
33. See Christopher A. Cotropia, *The Folly of Early Filing In Patent Law*, 61 HASTINGS L.J. 65 (2009).

34. See Sichelman, *supra* note 3.

patents can efficiently coordinate R&D.³⁵ Oskar Liivak takes a similar tack and would go so far as to limit patent infringement to instances where the accused infringer directly copied from the patent holder's technology.³⁶

These views divide scholars into various camps, depending on their particular levels of optimism among three axes: invention market optimism, commercialization market optimism, and patent coordination optimism (see Figure 1).

Figure 1: Typologies of Patent Scope Theorists



More generally, my thesis here is that scholars' differing empirical views about how well the market operates to promote invention and commercialization—along with how well patents can lead to the coordination of R & D activity—sculpts their theoretical positions about the proper role of patent scope and, indeed, the patent system as a whole. The traditional

35. JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK* (2008).

36. Oscar Liivak, *Rethinking the Concept of Exclusion in Patent Law*, 98 *Geo. L.J.* 1643 (2010).

debate among these scholars has been between commercialization market optimists/coordination pessimists like Merges and Nelson, who advocate relatively narrow patent scope, and commercialization pessimists/coordination optimists, like Kitch, who advocate relatively broad patent scope.

But a more complex empirical picture leads to much richer—and, indeed, even less tractable—sets of questions for the patent scope debate. For instance, the whole set of literature on cumulative invention³⁷—and the difficulties associated with optimally dividing rents between initial and follow-on inventors—can be fruitfully applied to issues in optimizing *commercialization* of an invention (or, a technological prospect, in Kitch’s terms). Indeed, Meurer has recently applied Scotchmer’s theory of cumulative invention to formulate a commercialization decision-making model.³⁸

Another area worthy of more study is how differences in industry structure and dynamic evolution should affect patent scope. Dan Burk and Mark Lemley have made an admirable initial attempt to tackle this thorny issue,³⁹ but several particulars are in need of further exploration, especially from an empirical standpoint. First, how do industries differ in the ability of the market to promote invention and commercialization? Second, how do they differ in the use of patents to coordinate R&D? Third, how do these results change as industries mature? Some empirical work in the industrial organization literature has explored answers to these questions, but much remains to be done. My sense is that further study will help scholars come to more agreement on which perspective outlined above best applies to particular industries, and companies and individuals within industries.

Next, each side of the Kitch-Merges/Nelson dichotomy arguably rests on unrealistic assumptions about the ideal structure of industrial innovation. Kitch’s work, especially the over-stylized accounts of it prevalent in the literature, promotes lodging the innovative process in a monopolist patentee that can coordinate every facet of R&D activity for a particular technological prospect.⁴⁰ Merges and Nelson counter Kitch by arguing in favor of competitive rivalry in innovation.⁴¹ Yet, the optimal approach to innovation may, in many situations, lie somewhere in a collaborative middle—whereby multiple parties, each with patents or some other form of proprietary know-how, cooperate in achieving an innovative

37. See, e.g., Christopher A. Cotropia, *After-Arising Technologies and Tailoring Patent Scope*, 61 N.Y.U. ANN. SURV. AM. L. 151 (2005); Arti K. Rai, *Fostering Cumulative Innovation in the Biopharmaceutical Industry: The Role of Patents and Antitrust*, 16 BERKELEY TECH. L. J. 813 (2001); Scotchmer, *supra* note 1.

38. See Michael J. Meurer, *Patent Notice and Cumulative Innovation* (Working Paper, May 15, 2008), available at http://innovationforum.gmu.edu/2008/papers/patent_notice.pdf (adapting Scotchmer’s approach so that the follow-on innovator is a commercializer that is subject to the original innovator’s patent). However, Meurer uses this adapted model to analyze the incentives of commercializers to search for potentially relevant patents—not to determine the effects of patent scope on commercialization. See *id.*

39. See DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* (2009); Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575 (2003).

40. See Kitch, *supra* note 4, at 276-80; Lemley, *supra* note 21, at 138-39.

result. For example, Netflix—the online provider of movies—recently staged a \$1 million contest to solicit algorithms to predict how a user would rate a movie after watching it in order to provide more accurate personalized movie recommendations.⁴² Thousands of teams entered the contest, and the few that finally emerged as the leaders, including the winning team, were mergers among many of the original teams.⁴³ The success of these sorts of collaborative strategies could reflect intermediate levels of R&D coordination defects in the market, counseling in favor of patent scope that lies somewhere between the relatively broad scope recommended by Kitch and the relatively narrow scope promoted by Merges and Nelson.

Last, if the patent system aims to govern a variety of separate innovative activities, then instead of trying to fine-tune the scope of one type of right, another option—which I have suggested elsewhere—is to split the patent system in half.⁴⁴ “Invention” patents would incentivize inventive activity, while “commercialization” patents would foster the commercialization of invention.⁴⁵ My proposal draws from the work of several scholars, including Abramowicz, Duffy, and William Kingston,⁴⁶ and while well-grounded conceptually, certainly needs further empirical study to test its soundness.

In sum, Kitch, Scotchmer, and Merges and Nelson took critical steps in promoting our understanding of the role of patent law, particularly patent scope, in cumulative invention and commercialization. However, in important respects, later scholars have developed more nuanced theoretical approaches. The variety of views on the topic, in my opinion, reflect differing underlying assumptions about how well the market functions to promote invention, commercialization, and the coordination of R & D among market actors. When these root differences are exposed, several important questions come to the fore, such as the cumulative nature of technology commercialization (not just invention), the tailoring of patent scope by industry, collaborative innovation, and the decoupling of patent rights. With further study of these and related issues, I believe enough consensus will emerge among scholars that we can begin to agree on how to best tailor patent scope. ■

41. See Merges & Nelson, *supra* note 2, at 908-09.

42. See Steve Lohr, *A \$1 Million Research Bargain for Netflix, and Maybe a Model for Others*, N.Y. TIMES, Sept. 21, 2009, available at <http://www.nytimes.com/2009/09/22/technology/internet/22netflix.html?pagewanted=1&r=1>.

43. See *id.*

44. See Sichelman, *supra* note 3.

45. See *id.*

46. William Kingston, *The “Thesis” Chapters*, in DIRECT PROTECTION OF INNOVATION (William Kingston ed. 1987); see also WILLIAM KINGSTON, BEYOND INTELLECTUAL PROPERTY (2010); Michael Abramowicz, *The Danger of Underdeveloped Patent Prospects*, 92 CORNELL L. REV. 1065, 1066 (2007); Abramowicz & Duffy, *supra* note 31.