

ARTICLES

INTELLECTUAL PROPERTY FOR MARKET EXPERIMENTATION

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Intellectual property protects investments in the production of information, but the relevant literature has largely neglected one type of information that intellectual property might protect: information about the market success of goods and services. A first entrant into a market often cannot prevent other firms from free riding on the information its entry reveals about consumer demand and market feasibility. Despite the existence of some first-mover advantages, the incentives to be the first entrant into a market may sometimes be inefficiently low, thereby giving rise to a net first-mover disadvantage that discourages innovation. Intellectual property may counteract this inefficiency by providing market exclusivity, thus promoting earlier market entry and increasing the level of entrepreneurial activity in the economy. The goal of encouraging market experimentation helps to explain certain puzzling aspects of current intellectual property doctrine and provides a coherent basis for appreciating some of the current criticisms of intellectual property rights.

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INTRODUCTION

Consider two similarly situated companies. Company *A* is contemplating testing thousands of materials to see if it can find one that could make standard light bulb filaments cheaper. No one knows for sure which, if any, will work. The testing process is expected to cost \$100,000,000 and holds about a 50% chance of yielding a successful new technology. If testing is successful and Company *A* obtains exclusive rights to the new material for a period of years, the firm would gain over \$200,000,000. Company *B*, meanwhile, is considering promoting a more efficient type of light bulb that was discovered long ago but never was marketed effectively. A marketing campaign costing \$100,000,000 is expected to hold only about a 50% chance of convincing consumers to accept the bulb, which produces a different tint of light from conventional bulbs and which, though cheaper in the long run, requires higher up-front costs. If the campaign is successful and the firm obtains exclusive rights to the newly commercialized bulbs for a period of years, the firm would reap over \$200,000,000.¹

¹ We have designed the hypothetical Company *B* to remind readers of the experience with compact fluorescent light bulbs (CFLs). The basic technology associated with the bulbs is now more than a half-century old and thus is in the public domain. See U.S. Patent No. 2,279,635 (filed Jan. 7, 1941) (disclosing compact fluorescent bulb with coil-shaped tube and standard socket mount); U.S. Patent No. 2,525,022 (filed Oct. 23, 1946) (disclosing light bulb having as “its principal object . . . to provide a compact lighting unit or fixture including a tubular fluorescent lamp of circular shape which is readily mountable in many types of fixtures designed for incandescent lamps”). By the 1980s, several companies were engaged in limited manufacturing of this type of bulb. See U.S. Patent No. 4,495,443 col.1 ll.23–24 (filed Jan. 27, 1984) (noting that compact fluorescent bulbs were already being “made by several companies”). Yet despite the long availability of the technology, the bulbs remained for decades only a small fraction of the market. See L.J. SANDAHL ET AL., PAC. NW. NAT’L LAB., COMPACT FLUORESCENT LIGHTING IN AMERICA: LESSONS LEARNED ON THE WAY TO MARKET 5.1 (2006), available at http://www.eere.energy.gov/buildings/info/documents/pdfs/cfl_lessons_learned_web.pdf (noting that sales of compact

The social benefits and costs of providing exclusive property rights are about equal in these two cases.² It makes no economic difference whether the source of risk arises from scientific or market uncertainty. The legal treatment, however, presents a paradox of differential treatment: Company *A* likely can secure exclusive rights, while Company *B* likely cannot.³ In this Article, we ask why this differential treatment exists and whether it should continue.

Intellectual property law has long been understood as a means of encouraging the production of information in the form of technological discoveries and creative works. Modern intellectual property theory, however, has generally paid little attention to information arising from market experimentation.⁴ Economists, ranging from leading twentieth-century champions of free markets to modern economists studying matters as seemingly diverse as high-tech entrepreneurship and economic growth in developing economies, have long recognized a parallel between market experimentation and technological experimentation.⁵ They have not, however, explored the implications of that parallel. Thus, even those who support intellectual property rights have not considered the possibility that such rights

fluorescent bulbs in United States remained below 1% of screw-socket bulb market through 2000 and “jump[ed]” to 2.1% market share by end of 2001). The new bulbs faced numerous marketing and consumer-information hurdles. *See id.* at 2.1–2 (describing consumer barriers to widespread adoption of CFLs into U.S. residential market). By the late 1990s, the technological problems (which can be the subject of exclusive rights) had been solved in a variety of ways, but the overarching market problems remain unsolved to this day. Perhaps existing market barriers could be overcome with extensive “educational and marketing campaigns,” “in-store product demonstrations,” and “guarantees or trusted labeling” to back up claims of long-lasting performance, *id.* at 7.2, but with “hundreds” of competing manufacturers, *id.* at 5.1 tbl.5.1, no one firm may be able to reap any significant rewards from such efforts, even if they turn out to be successful.

² In both cases, the producer of the information may receive a small expected profit and, assuming that the demand curve has a downward slope, consumers will collect some surplus. The benefits may not be exactly identical because success and failure might have implications for other projects. For example, success in identifying the better material might give scientists clues about how to search more efficiently for other new materials in the future. There are also possible social benefits to the market experiment: Pioneering the market for more efficient lights might give other businesses more information about the potential market for other products. The social benefits for each type of experiment might differ, but the problems of scientific and market uncertainty are structurally the same.

³ *See* 35 U.S.C. § 102(a)–(b) (2000) (precluding grant of exclusive rights for non-novel subject matter).

⁴ By “market experimentation,” we mean the commercial test of a product or service that is new to the market in which it is launched and that has uncertain prospects for commercial success. In using this definition, we mean to distinguish it from technological experimentation, which could occur in a laboratory and which would test feasibility as a matter of science and engineering.

⁵ *See infra* Part I.

could be modified or extended to provide direct incentives for market experimentation, nor have they considered the possibility that various subtle features of current intellectual property systems may already foster market experimentation.

Modern intellectual property theory posits that market exclusivity imposes a static cost but that the dynamic benefit of encouraging information production and dissemination may make this cost worth bearing. This same logic applies to market experimentation. The effective launch of a new product or service may require substantial investments. Commercial success or failure produces information about market demand and supply upon which competitors often can free ride. To be sure, early experimenters will gain some first-mover advantages, as they also do with technological innovations, but late-entering competitors obtain two important second-mover advantages against early market experimenters. First, they do not have to bear the cost of investing in market development. Second, they can copy the first experimenter's market successes and avoid repeating its failures. Once such market information is created, consumers would benefit from competition, but without a sufficient guarantee of exclusivity, it may be that no one will have enough incentive to undertake the risky initial investment in developing and testing the market. Just as patents encourage risky but ultimately beneficial technological experimentation, some form of intellectual property protection could result in a socially beneficial increase in market experimentation and entrepreneurial activity.

We anticipate two general objections to the argument for intellectual property for market experimentation. The first was voiced long ago by Friedrich Hayek as a general objection to any form of government-sanctioned exclusive rights to promote innovation: The free market already provides abundant incentives to experiment and innovate.⁶ This "Hayekian" position draws no distinction between technological and market experimentation; thus, it would resolve the paradox of differential treatment present in the law by abolishing intellectual property rights for innovation generally. The Hayekian position has remained a polar position and, while free competition remains an important alternative to intellectual property in some cir-

⁶ As we show in Part I, *infra*, the argument has its intellectual roots in the writings of Friedrich Hayek, whose defense of free market principles stressed the ability of unregulated markets to generate information and innovation through constant and pervasive experimentation.

cumstances,⁷ all developed nations now recognize intellectual property rights as a means of fostering technological experimentation.

The second objection maintains that even if free competition is suboptimal in encouraging market experimentation, the remedy of expanding intellectual property protection will be worse than the original disease. This argument is more formidable than the Hayekian objection. Certainly, we acknowledge that even a limited grant of exclusive rights may impose significant costs on society. However, given the fundamental similarities between technological and market experimentation, it would be highly surprising if the optimal policy choice for encouraging market experimentation were always to rely upon whatever natural first-mover advantages exist in a particular market and never to deploy some form of exclusive rights, since society generally relies on exclusive rights to encourage technological experimentation. Moreover, we observe that exclusive rights have been, and continue to be, used in some circumstances to encourage market experimentation. British “patents of importation” were permissible for hundreds of years and present a very clear example of exclusivity being used to encourage experimentation in new markets.⁸ Exclusive franchise agreements are a widely employed means by which franchisors encourage new franchisees to risk developing a business in new geographic locations.⁹ Finally, recognition that market experimentation may be a legitimate goal of intellectual property does not necessarily lead to an expansion of intellectual property rights. Since there is already a patchwork of imprecise protection in the current legal doctrine,¹⁰ a more coherent and carefully tailored system may be able to provide greater encouragement for market experimentation while reducing the overall costs to society of existing intellectual property rights.¹¹

In Part II, we present our own argument that a hypothetical regime of free competition would provide inefficiently low incentives

⁷ See generally Michael A. Carrier, *Unraveling the Patent-Antitrust Paradox*, 150 U. PA. L. REV. 761 (2002) (arguing that competition and patents are alternative means of fostering innovation and that patent system should be curtailed in industries where competition is successful in fostering sufficient degree of innovation).

⁸ See *infra* notes 114–17 and accompanying text.

⁹ See *infra* note 112 and accompanying text.

¹⁰ See *infra* Part III (discussing market experimentation in current intellectual property doctrine).

¹¹ See *infra* notes 218–19 and accompanying text (arguing in favor of restricting existing doctrine that allows innovation’s commercial success to support validity of patents). The proposed alternative—limiting the doctrine so that only the patentee’s commercial success could be used—may provide a clearer metric for the doctrine and may reduce the number of patents permitted on relatively trivial developments that would have been marketed even without a government grant of exclusive rights.

for market experimentation. Admittedly, we are handicapped in finding empirical support for our claim that the existing level of market experimentation is inefficiently low; it is difficult to measure what does not exist. There are, however, strong theoretical arguments that incentives for market innovation are insufficient. Industrial organization scholars have long recognized that in many contexts, free entry will not lead to socially optimal entry.¹² Similarly, the literature on business management has recognized that while first movers enjoy significant advantages, second movers have significant advantages too.¹³ Our model focuses on the ability of a market experiment to produce information of a type generally ignored by the literature—information about whether consumer demand and other market conditions will permit commercial success.¹⁴ Our model shows how a system of free competition with no exclusive rights for market experiments may provide inadequate incentives to induce socially valuable experiments such as the introduction of a new (but technologically uninnovative) product or service or even the marketing of an old product or service to a new geographic market. We demonstrate that intellectual property protection for market experimentation can raise

¹² See, e.g., Avinash K. Dixit & Joseph E. Stiglitz, *Monopolistic Competition and Optimum Product Diversity*, 67 AM. ECON. REV. 297, 297, 308 (1977) (noting that because of scale economies, competitive market with free entry will produce “suboptimal” solution while “monopoly power enables firms to pay fixed costs” and thus “the relationship between monopoly power and the direction of market distortion is no longer obvious”); N. Gregory Mankiw & Michael D. Whinston, *Free Entry and Social Inefficiency*, 17 RAND J. ECON. 48, 57 (1986) (providing intuitive foundation for appreciating “the inefficiencies that can arise from free entry in the presence of fixed set-up costs”); Steven C. Salop, *Monopolistic Competition with Outside Goods*, 10 BELL J. ECON. 141, 154 (1979) (setting forth model demonstrating that, under certain assumptions, optimal policy for regulating industrial entry could be “either free entry or entry restricted to the point of each brand having a complete monopoly market”).

¹³ See, e.g., Roger A. Kerin et al., *First-Mover Advantage: A Synthesis, Conceptual Framework, and Research Propositions*, 56 J. MARKETING 33, 34–39 (1992) (discussing extensive economic literature about first-mover advantages and disadvantages and identifying areas in which more research is necessary); Marvin B. Lieberman & David B. Montgomery, *First-Mover Advantages*, 9 STRATEGIC MGMT. J. (SPECIAL ISSUE) 41, 42–47 (1988) (same); see also Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257, 257–58, 268–70 (2007) (noting that competitors entering market after first mover can benefit from information arising from first mover’s decisions, allowing them to apply knowledge obtained from publicly released patent toward more innovative products and processes); Lieberman & Montgomery, *supra*, at 47–49 (noting that “[l]ate-movers may be able to ‘free-ride’ on a pioneering firm’s investments in a number of areas including R&D, buyer education, and infrastructure development” and may be able to “gain an edge through resolution of market or technological uncertainty”).

¹⁴ See generally Michael Waldman, *Noncooperative Entry Deterrence, Uncertainty, and the Free Rider Problem*, 54 REV. ECON. STUD. 301 (1987) (considering uncertainty about demand in context in which members of existing oligopoly are considering whether to take actions that might deter subsequent entry). Waldman’s analysis, however, does not consider the problem of the first entrant into a new market.

social welfare, even if the exclusive rights impose substantial dead-weight losses and are subject to other known limitations and difficulties. The advantages of exclusive rights seem to outweigh the disadvantages across a wide set of plausible assumptions.

Furthermore, as we show in Part III, the goal of promoting market experimentation is not as alien to existing intellectual property regimes as it may first seem. Perhaps as much by accident as by design, our existing systems of intellectual property already include several doctrines that are difficult to explain unless the relevant intellectual property rights are recognized as partially advancing the goal of encouraging market experimentation.¹⁵ For example, some observers have argued that productive American industry is being overrun by “patent trolls,” companies that produce no actual products but that merely obtain and enforce patents.¹⁶ The conventional theory of the patent system maintains that the basic quid pro quo for obtaining exclusive patent rights is the disclosure of technology set forth in the patent document itself.¹⁷ Under that theory, the concern about patent trolls seems inexplicable: Someone who makes a sufficient disclosure and obtains a valid patent cannot be gaming the system. But if the patent system is recognized as having mixed goals—both spurring the disclosure of technological information and fostering actual investment in real-world market experiments—then the concern over patent trolls makes sense. The law should be more generous to firms that have both made technological disclosure in

¹⁵ F. Scott Kieff observes that patent law may promote commercialization of new technologies by offsetting second-mover advantages, though he does not address the possibility that intellectual property might promote commercialization in the absence of technological innovation. See F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 708–10 (2001) (“The patent right to exclude competitors who have not shared in bearing [the] initial costs provides incentives for [the first mover] to . . . incur all costs necessary to facilitate commercialization of the patented invention.”).

¹⁶ See, e.g., Joe Nocera, *Tired of Trolls, A Feisty Chief Fights Back*, N.Y. TIMES, Sept. 16, 2006, at C1 (describing “patent trolls” as firms that, “[i]nstead of using [their patents] to build a commercial product, . . . extract licensing fees from companies that are making and selling real products,” and asserting that such firms are responsible for patent litigation becoming “part of the dark underbelly of American business”); see also James F. McDonough III, Comment, *The Myth of the Patent Troll: An Alternative View of the Function of Patent Dealers in an Idea Economy*, 56 EMORY L.J. 189, 189–90 (2006) (collecting criticisms of patent trolls, which are defined as firms that “acquire[] ownership of a patent without the intention of actually using it to produce a product”). For a historical analysis showing that patent trolls are nothing new, see generally Gerard N. Magliocca, *BlackBerries and Barnyards: Patent Trolls and the Perils of Innovation*, 82 NOTRE DAME L. REV. 1809 (2007). For the argument that trolls are merely traders in property rights who increase liquidity and decrease transaction costs, see McDonough, *supra*, at 204, 211–20.

¹⁷ J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int’l, Inc., 534 U.S. 124, 142 (2001) (“The disclosure required by the Patent Act is ‘the quid pro quo of the right to exclude.’” (quoting *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 484 (1974))).

patent documents *and* risked assets in launching new businesses based on the technology.

Existing intellectual property systems, however, do not provide well-tailored incentives for market experimentation. The problem is that the granting of intellectual property protection—specifically, patents—is not dependent upon the extent to which an innovation will promote market experimentation. This holds true even with—perhaps especially with—the modern advent of so-called business method patents.¹⁸ Such patents might be granted for innovations that are based on new technologies but that would have been created and marketed even without patent protection.¹⁹ On the other hand, such patents could be refused for being technologically obvious, non-novel, or outside the scope of patentable subject matter, even though some grant of economic exclusivity might be needed to encourage the risky testing of such ideas in the marketplace.²⁰ A more reasonable system would be open to granting exclusive rights based on market, rather than technological innovation, but only in those cases where the market success is truly doubtful—in other words, where the market innovation is nonobvious.

We reject the conclusion that intellectual property theory and property rights theory fail to contemplate property protection for market experimentation because information about market success is a type of information that inherently needs no protection. Rather, we argue that these theories fail to contemplate it because our property

¹⁸ See *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1375 (Fed. Cir. 1998) (upholding business method patent and concluding that, “[s]ince the 1952 Patent Act, business methods have been, and should have been, subject to the same legal requirements for patentability as applied to any other process or method”); see also *Carrier*, *supra* note 7, at 826 (arguing that patents are not necessary for Internet business methods because they generally reflect “simple ideas easily conceived”). The availability of pure business method patents has recently been placed in doubt by the decision in *In re Comiskey*, 499 F.3d 1365 (Fed. Cir. 2007). See *infra* note 20.

¹⁹ See, e.g., *Method and System for Placing a Purchase Order Via a Communications Network*, U.S. Patent No. 5,960,411 (filed Sept. 12, 1997) (disclosing patent for making of online purchases with single mouse click); see also *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1347, 1364–66 (Fed. Cir. 2001) (finding that Amazon.com demonstrated likely literal infringement of ’411 Patent, but remanding for determination of whether patent met requirement of nonobviousness).

²⁰ *Comiskey*, 499 F.3d at 1378–79 (“It is thus clear that the present statute does not allow patents to be issued on particular business systems—such as a particular type of arbitration—that depend entirely on the use of mental processes.”). The Federal Circuit’s decision in *Comiskey* also states, in dicta, that computer-implemented business methods may remain unpatentable due to obviousness if the computerization of the business method is merely “[t]he routine addition of modern electronics to an otherwise unpatentable invention.” *Id.* at 1380. The court was willing to disallow issuance of the patent even if the applicant could demonstrate a “long-felt need for the unpatentable mental process.” *Id.*

rights institutions, as currently designed, are poorly suited to afford such protection. Institutional limitations have become theoretical limitations that inhibit a clear conceptualization of the entire field of intellectual property. This Article's theoretical ambition is to demonstrate that market experimentation can produce information that, if institutional difficulties can be overcome, would sometimes be worth protecting much in the same way that intellectual property is currently protected. This Article's practical ambition is to consider the relevance of this insight for existing intellectual property institutions and doctrines.

Part I discusses the economic literature on market experimentation and shows how the differential treatment of technological and market experimentation has long presented a puzzle to theorists. Part II presents our model explaining why market experimentation will be inefficiently low without protection and then discusses different types of market experimentation. Finally, Part III shows that a concern for market experimentation helps explain several inconsistent aspects of current intellectual property doctrine. We conclude that market experimentation provides a fuller positive account of intellectual property law, and that more direct consideration of market experimentation theory could lead to improvement of intellectual property doctrine and institutions.

I

TECHNOLOGICAL AND MARKET EXPERIMENTATION IN ECONOMIC THOUGHT

The ability of open markets to foster entrepreneurial activity, experimentation, and innovation has played a pivotal role in the defense of free-market economic policies for at least a century. We review that history here to make three points. First, although technological experimentation is considered distinct from market experimentation in legal doctrine, the economic literature generally does not make the assumption that technological experiments are inherently different from—or more in need of legal protection than—other forms of risky but socially desirable testing. Second, most defenders of free markets, who generally think little of government-regulated central planning as a means of fostering experimentation and innovation, have long recognized that unbridled competition is not necessarily the optimal policy for encouraging experimentation. Indeed, free-market economists have often confronted the problem that market experimenters may not be able to appropriate a fraction of the gains from their experimentation sufficient to justify the

expense and risk of the experiment in the first place. This “appropriability problem” has several conventional solutions, none of which is considered complete. Third, in more recent years, some economists in various fields—particularly those who study developing countries and entrepreneurship—have become increasingly impatient with the traditional solutions to the appropriability problem and have sought new means to address the problem. That group of economists, however, has tended to accept the existing structure of intellectual property law as a given. By reviewing how defenders of free markets have recognized both the similarity between technological and market experimentation and the limitations of the market in fostering an optimal amount of experimentation, we hope to counter the intuition that competition alone is particularly well suited to generate experimentation in a free market and to suggest that the possibility of intellectual property for market experimentation is a natural extension of the more recent economic literature.

A. Free-Market Experimentation and the Appropriability Problem

An intellectual connection between free markets and innovation began to be constructed in the early twentieth century, at the inception of what would be a pitched battle between the advocates of governmental control of industry and the defenders of the free market.²¹ Frank Knight, an early leader of the Chicago school of economics, saw the encouragement “of entrepreneurship or risk-taking”—i.e., experimentation—as “the central principle of the enterprise economy.”²² Social control of industry, he believed, was undesirable precisely because it could diminish risk-taking, for “[t]he real trouble with bureaucracies is not that they are rash, but the opposite. . . . [T]hey universally show a tendency to ‘play safe’ and become hopelessly conservative,” leading to “the arrest of progress and the vegetation of life.”²³ Hayek likewise thought that the true strength of the free market was its ability to make “constant deliberate adjustments, by new dispositions made every day in the light of circumstances not

²¹ The best recounting of this epic struggle is in DANIEL YERGIN & JOSEPH STANISLAW, *THE COMMANDING HEIGHTS: THE BATTLE FOR THE WORLD ECONOMY* (2002). As Yergin and Stanislaw note, by the middle of the twentieth century, “[t]he Soviet Union enjoyed an economic prestige and respect in the West that is hard to reconstruct today”: Admiration came “even from conservatives,” for “[t]he limitations and rigidity of central planning—and, ultimately, its fatal flaw, its inability to innovate—were still decades away from being evident.” *Id.* at 4.

²² Frank H. Knight, *Socialism: The Nature of the Problem*, 50 *ETHICS* 253, 285 (1940).

²³ FRANK H. KNIGHT, *RISK, UNCERTAINTY, AND PROFIT* 361 (Sentry Press 1964) (1921).

known the day before.”²⁴ Joseph Schumpeter stressed that the free market generates a “perennial gale of creative destruction” in which productive competition comes from “the new commodity, the new technology, the new source of supply, [or] the new type of organization.”²⁵ All three saw the dynamic process of risk-taking, experimentation, and innovation as the central strength of a free market and understood that the phenomenon went beyond technological advances that could be achieved by researchers in lab coats. Innovation was seen as broadly encompassing all forms of risk-taking and entrepreneurship, from new technology to new business organization to minutia-laden everyday business decisions.

Yet in championing the ability of the free market to foster experimentation and innovation, defenders of capitalism confronted a basic problem: Precisely because the market is free from governmental regulation, copycats are able to enter and thrive if an innovation turns out to be successful. Their entry can drive the price of the new product or service down, thereby benefiting consumers in the short run but reducing profits so substantially as to prevent the experimenter from appropriating a sufficient fraction of the social gain to justify the experimenter’s expense in undertaking the risky experiment in the first place. Thus, while individuals and firms may have more freedom to innovate in a free-market economy than under central planning, the incentive to do so may well be insufficient.

There are various possible approaches to this appropriability problem. One derives from Hayek’s conceptualization of experimentation as involving “small changes”—i.e., the plethora of “day-to-day adjustments” that are conducted at low cost and that produce optimal

²⁴ F.A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519, 524 (1945).

²⁵ JOSEPH A. SCHUMPETER, *CAPITALISM, SOCIALISM, AND DEMOCRACY* 84 (2d ed. 1947). Schumpeter was an unusual defender of capitalism because he believed that the success of capitalism would ultimately lead to its demise. There are various theories as to why he took that position. It is possible that he was seeking to influence young economists who at the time widely believed that capitalism would soon be replaced by socialism. His prediction of capitalism’s demise could then be seen as “bait, leading leftist intellectuals who would never pick up or take seriously the work of a more overt defender of capitalism to bite into the book.” JERRY Z. MULLER, *THE MIND AND THE MARKET: CAPITALISM IN MODERN EUROPEAN THOUGHT* 307 (2002). Another possibility is that Schumpeter truly believed that socialism would prevail, even though it would not be “as efficient as capitalism,” because it would offer society other advantages such as “higher public morale.” ROBERT L. HEILBRONER, *THE WORLDLY PHILOSOPHERS* 324 (5th ed. 1980). Finally, Schumpeter’s prediction of doom may have been a call to arms for the defenders of capitalism—a position seemingly supported by his preface to the second edition of *Capitalism, Socialism, and Democracy*. See SCHUMPETER, *supra*, at xi (marking that prediction of doom on sinking ship may spur crew to “rush to the pumps”).

results through multiple and repetitive incremental changes.²⁶ Paradigmatic examples would be changes in prices, suppliers, and the quantity or quality of the goods produced or ordered.²⁷ With millions of producers and sellers continually making such adjustments, the result may be reasonably optimal solutions within the parameters of the existing market. While Hayek appeared satisfied that this mechanism would always provide a sufficient amount of innovation, incremental change does not work in all situations. Small modifications to cars and trains did not lead to the airplane, little changes to aspirin did not lead to antibiotics, and optimizing adjustments to the traditional mail system did not produce FedEx.

Although intellectual property law is a seemingly obvious solution to the appropriability problem, early theorists such as Knight and Schumpeter understood that the intellectual property protections available under the law²⁸ could protect only a subset of the experimentation that should be encouraged in a free market. Knight viewed trade secret law and the patent system as important means of addressing the problem that, “owing to the low cost of indefinitely multiplying an idea, it is usually difficult to capitalize an increase in productive power.”²⁹ As he summed it up, “[m]aking innovations is a gamble, and a lottery cannot function without large prizes.”³⁰ Knight recognized, however, that existing intellectual property law would make it difficult for an innovator to “secur[e] any permanent gain” from an “improvement of business organization and methods” because such an improvement was “usually neither patentable nor capable of being kept secret.”³¹ He also recognized that these sorts of innovations were a “form of progress” in which society should

²⁶ See Hayek, *supra* note 24, at 523 (disparaging idea that “changes . . . have become less important in modern times” and bemoaning that “economists are increasingly apt to forget about the constant small changes which make up the whole economic picture”).

²⁷ See *id.* at 524 (listing pedestrian adjustments such as firm’s decisions to buy “tiles for its roof” and “stationery for its forms”).

²⁸ While Knight and Schumpeter wrote during the first half of the twentieth century, the scope of intellectual property law remains similar today. See *infra* Part III (discussing current state of intellectual property law).

²⁹ KNIGHT, *supra* note 23, at 372. The desire to encourage “investment in invention,” Knight believed, led society to “permit[] an inventor or his assigns to keep his idea secret as long as possible.” *Id.* But because secrecy was often “impracticable,” “the patent system has come into general use establishing and protecting by law a *temporary*, and rather short-lived, property right in the improvement.” *Id.*

³⁰ Knight, *supra* note 22, at 285.

³¹ KNIGHT, *supra* note 23, at 372–73; see also *id.* at 341–42 (noting that patents and secrecy are possible only in certain circumstances and that “[i]n many cases no direct safeguards are available and the economic profitableness of the idea is limited to the period of time required for competitors to copy the new method”).

encourage investment.³² Yet after thoughtfully identifying this problem, Knight largely dodged solving it. He asserted that “there is no evidence of any unwillingness to make expenditures in this form of improvement,” even though that “fact” was puzzling to him.³³ Perhaps Knight simply assumed, as others have,³⁴ that the large amount of market innovation precluded the possibility that there still might be inefficiently little of it.³⁵

Schumpeter’s solution to the appropriability problem looked not to intellectual property but to market structure. He mentioned patents and trade secrets solely to remind readers that these were “only special cases of a larger class” of the “protecting devices” that are necessary complements to investment in entrepreneurial action.³⁶

³² *Id.* at 372. Knight defined “invention[s]” . . . in a broad sense” to include not only “the improvement of technological processes” but also improvements to “methods of organization, and the like.” *Id.* at 339.

³³ *Id.* at 373.

³⁴ *See, e.g.,* ROBERT P. MERGES, *PATENT LAW AND POLICY* 155 (2d ed. 1997) (“[T]he relatively frequent innovations in the financial services industry prior to the era of patentability suggest that firms had adequate means to appropriate the value of their new financial innovations.”).

³⁵ Knight speculated that trademark law might provide the solution—that the investment in innovative business might “yield a more permanent advantage through the use of distinctive brands and legal protection of trade marks and trade names.” KNIGHT, *supra* note 23, at 373. Indeed, as we will argue, trademark and trade dress law are partially tailored to protect investments in innovative businesses. *See infra* Part III.A. They may not, however, provide a complete solution to the problem, for trademark and trade dress law have been designed primarily to identify goods to consumers, and the rights conferred provide only a modest barrier preventing later entrants from copying a first mover’s success. Knight’s speculation about trademark law concluded his examination of the problem, and even in his later writing he left unanswered the “interesting question[]” of why individuals would make sacrifices to promote progress where the resulting advances fell into the lacunae between the various protections of intellectual property. KNIGHT, *supra* note 23, at 372–73. For example, in his 1940 critique of socialism, Knight asserted:

Inventions and technical improvements of other sorts, whether patentable or not, are in fact private property under the law of modern industrial nations, or they certainly are such for the purposes of economic analysis as long as the person who makes an innovation is in a position to derive any income from it in excess of the necessary remuneration of the productive agencies employed in putting it into effect.

Knight, *supra* note 22, at 283–84. Yet he did not explain how a person would obtain that necessary remuneration if the invention were not legally protected. *See* Frank H. Knight, *Discussion*, 44 *AM. ECON. REV.* 63, 65 (1954) (recognizing that any “new product or other departure” from status quo “involves risk” and therefore “must yield an excess, a monopoly return, over some period to cover costs,” but failing to investigate whether existing legal structures afforded monopoly return to successful novelties over optimal period).

³⁶ SCHUMPETER, *supra* note 25, at 88. A similar theme can be found in some of Knight’s later writings. *See, e.g.,* Frank H. Knight, *Free Society: Its Basic Nature and Problem*, 57 *PHIL. REV.* 39, 52 (1948) (asserting that “a great deal of other monopoly is essentially of the same nature” as patent system because monopoly provides “a stimulus to devising and introducing useful innovations”).

The protecting devices, he noted, were various ways, “which most economists condemn,” of obtaining and maintaining a monopolistic or oligopolistic position.³⁷ Schumpeter believed that the appropriability problem would be diminished if a market, rather than being perfectly competitive, was dominated by a few large firms or even by a monopoly.³⁸ The short-term cost to society would come in terms of diminished competition, but the long-term benefit would be greater innovation.

To a modern observer, Schumpeter’s emphasis on market structure seems strange. Modern literature—even that which expressly builds on his insights—views large firms as a potential threat to innovation precisely because they may lose their entrepreneurial powers of innovation and become very good imitators that “effectively barricade[] [the industry] from the entry and growth of small innovators.”³⁹ Moreover, Schumpeter’s assumption that large firms would be more innovative than small ones seems contrary to the entire experience of innovation in, for example, the Silicon Valley economy.⁴⁰ Consequently, modern innovation policy tends to remain agnostic about industrial structure. Government, it is generally thought, should reward innovation without regard to whether the innovation is produced by a small start-up, like Google a decade ago, or a giant firm, like Google today.

Schumpeter realized that the conventional vision of intellectual property was incapable of covering all the types of experimentation in which firms could engage. If intellectual property rights are assumed to be significantly limited in their effectiveness, his emphasis on market structure makes sense. Indeed, Schumpeter’s emphasis on market structure spawned an entire literature on the connection between market structure and innovation. In retrospect, a striking aspect of this literature is how little attention is given to the possibility that intellectual property rules might be modified to address the basic

³⁷ SCHUMPETER, *supra* note 25, at 88.

³⁸ *Id.* at 101.

³⁹ RICHARD R. NELSON & SIDNEY G. WINTER, AN EVOLUTIONARY THEORY OF ECONOMIC CHANGE 367 (1982).

⁴⁰ The empirical support for a correlation between industrial concentration and innovation has always been viewed as problematic. *See, e.g.*, Wesley M. Cohen & Steven Klepper, *A Reprise of Size and R & D*, 106 *ECON. J.* 925, 925–26 (1996) (noting long-standing controversy over whether large firms are more innovative than small firms); F.M. Scherer, *Market Structure and the Employment of Scientists and Engineers*, 57 *AM. ECON. REV.* 524, 530 (1967) (concluding that relationship between industrial concentration and innovation is “complex” and that where industry concentration becomes too high, further concentration “is probably not conducive to more vigorous technological efforts and may be downright stultifying”).

appropriability problem.⁴¹ The next Section reviews the limited progress that has been made in the direction of adapting intellectual property rules.

B. *Modern Rethinking of Market Experimentation*

More recent economic writing has shown a great willingness to conceive of economic ventures in virtually the same terms as experiments in engineering or technology. This modern literature—especially the literature on entrepreneurship and developing economies—takes the congruence of market and engineering experimentation *nearly* to its logical conclusion. We say “nearly” because while the literature recognizes that exclusivity can foster market experimentation, it does not consider whether property rights should be extended to protect the fruits of such experiments. Perhaps because they are not trained in the law, economists seem timid in recommending changes to it. Instead, they take the law largely as a given—as a constraint—and focus their attention on how market institutions respond to those constraints.

A good example is found in the writings of Professors Scott Shane and S. Venkataraman, two leading scholars in the study of entrepreneurship. Following in the tradition of Schumpeter, Shane and Venkataraman recognize entrepreneurship as “the crucial engine”

⁴¹ For example, Richard Nelson and Sidney Winter extensively discuss the role of market structure in facilitating innovation and economic evolution, and yet they barely mention intellectual property or the patent system. See NELSON & WINTER, *supra* note 39, at 273–351. Neither rates an entry in their book’s index. See *id.* at 433–35. Patent policy is mentioned only as one variable affecting the rate of industrial imitation. See *id.* at 332 (noting that patent policy can make imitation “hard or easy”). Nelson and Winter view patent policy as “indirectly” affecting market structure and market structure as affecting appropriability and, consequently, innovation. *Id.* at 332. A wide swath of literature takes a similar approach, considering industry structure to be one of the most important determinants of innovation. See, e.g., Morton I. Kamien & Nancy L. Schwartz, *Market Structure and Innovation: A Survey*, 13 J. ECON. LITERATURE 1, 2–3 (1975) (noting that “[f]ew, if any, economists maintain that perfect competition efficiently allocates resources for technical advance” and that among those “who contend that an imperfectly competitive market system is the best alternative” for encouraging innovation, literature tends to focus on “relationship[] between R&D activity and firm size”); Glenn C. Loury, *Market Structure and Innovation*, 93 Q.J. ECON. 395, 395 (1979) (“Both theoretical and empirical studies have suggested the existence of a degree of concentration intermediate between pure monopoly and atomistic (perfect) competition that is best in terms of R&D performance.” (footnotes omitted)); Edwin Mansfield, *Size of Firm, Market Structure, and Innovation*, 71 J. POL. ECON. 556, 556 (1963) (noting that “[i]n recent years economists have become interested” in determining “the effects of an industry’s market structure on its rate of technical progress”); Oliver E. Williamson, *Innovation and Market Structure*, 73 J. POL. ECON. 67, 67–68 (1965) (focusing attention on reasons that firm size might be thought to affect innovative performance). The alternative, which this Article attempts to address, is to consider intellectual policy as a direct means of addressing the appropriability problem.

driving change in a capitalist society.⁴² They also recognize that entrepreneurship is tied to the production and exploitation of new information, and they expressly note that the opportunities for entrepreneurship “need not be restricted to . . . technological developments.”⁴³ They acknowledge the appropriability problem of information generated by entrepreneurship, noting that the new “information diffuses to other members of society who can imitate the innovator and appropriate some of the innovator’s entrepreneurial profit.”⁴⁴ Yet they accept the legal structure addressing the appropriability problem as a given; Shane and Venkataraman view entrepreneurial activity as depending upon factors such as “[t]he provision of monopoly rights, as occurs with patent protection or an exclusive contract,” and “the slowness of information diffusion or the lags in the timeliness with which others recognize information.”⁴⁵

Similarly, another leader in entrepreneurial economics, Mark Casson, draws a creative connection between patents and the exclusive charters granted to English trading companies in the seventeenth through nineteenth centuries.⁴⁶ Casson recognizes that the exclusive trading “charter conferred on the company can be regarded as the equivalent of a patent conferred on a technical invention” because the charter “rewarded pioneers who collected valuable information about new overseas sources of supply.”⁴⁷ Such rewards, Casson recognizes, “were required to compensate for the considerable costs that were sunk in collecting this information,” and, without the exclusive charter, the “[p]rivate reward would have been dissipated by competition.”⁴⁸ Yet elsewhere, Casson accepts that, unlike scientific inventions, “[i]nformation about opportunities for trade . . . cannot be patented.”⁴⁹ He then considers the implications of that legal constraint on observable traits of firms but does not consider the possibility of eliminating or relaxing it.⁵⁰ Other writers have taken a similar approach, viewing economic experiments as similar to techno-

⁴² Scott Shane & S. Venkataraman, *The Promise of Entrepreneurship as a Field of Research*, 25 ACAD. MGMT. REV. 217, 219 (2000).

⁴³ *Id.* at 221.

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ MARK CASSON, INFORMATION AND ORGANIZATION 245–46 (1997).

⁴⁷ *Id.*

⁴⁸ *Id.* at 246.

⁴⁹ *Id.* at 82.

⁵⁰ *Id.* at 82–84.

logical experiments but then considering the implications of that insight solely in terms of how it will affect the structure of firms.⁵¹

Perhaps the most insightful of the modern literature is found in the field of development economics. For example, Ricardo Hausmann and Dani Rodrik of Harvard describe precisely the basic problem of market experimentation when they note, “If learning what a country is good at producing requires an investment *and* the returns to that investment cannot be fully appropriated, the problem faced by potential entrepreneurs in developing countries is identical to the problem faced by innovators in the advanced industrial countries.”⁵² Moreover, they recognize that “the policy environments facing the ‘innovators’ in the two settings are quite different” because the innovator in the developed country can typically obtain intellectual property, which “protects discoverers of new goods through . . . patents,” but “the investor in the developing country who figures out that an existing good can be produced profitably at home does not normally get such protection, no matter how high the social return.”⁵³ Indeed, developing countries are usually encouraged to promote competition and lower the barriers of entry, but “[f]ree entry makes the nonappropriability problem worse.”⁵⁴ Nevertheless, despite the crispness with which they identify the problem, Hausmann and Rodrik consider only conventional policy tools, such as “trade protection, public sector credit, tax holidays, and investment and export subsidies,”⁵⁵ as possible remedies in the developing world.

As with the literature concerning developed economies, scholars in the field have generally overlooked the possibility that intellectual property rights might be tailored to address the appropriability problem. In Part III, this Article considers that possibility directly. First, though, we present models of the economic ramifications of the existing problem and quantify the potential benefits of resolving it.

II

MODELING THE MARKET EXPERIMENTATION PROBLEM

Justice Holmes’s famous defense of free speech insists that “the best test of truth is the power of the thought to get itself accepted in

⁵¹ See, e.g., Kirsten Foss & Nicolai J. Foss, *Organizing Economic Experiments: Property Rights and Firm Organization*, 15 REV. AUSTRIAN ECON. 297, 297–99 (2002) (seeking to understand nature of firm given insight that market process is experimental).

⁵² Ricardo Hausmann & Dani Rodrik, *Economic Development as Self-Discovery*, 72 J. DEV. ECON. 603, 606 (2003).

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ *Id.* at 629.

the competition of the market.”⁵⁶ This marketplace analogy works because of a general assumption that markets at least succeed in sorting out good and bad business ideas. Indeed, we agree with Schumpeter that markets facilitate the process of creative destruction, ultimately promoting economic growth.⁵⁷ Neither legal nor economic scholarship, however, pays much attention to the question of whether the degree of marketplace experimentation is optimal. This Part will seek to identify various reasons why market experimentation may be suboptimal while acknowledging that there might be some factors pushing in the other direction.

The possibility that entry into markets may not be perfectly calibrated is nothing new. The economic literature on imperfect competition has long recognized that there might be too little or too much entry into particular markets.⁵⁸ What differentiates our analysis from previous inquiries is, first, that we focus on entry into new markets and, second, that we emphasize the uncertainty of success and the entrepreneur’s inability to prevent others from free riding on information produced by market experimentation. Ultimately, though, our story describes a familiar market failure: Market experimentation, because it produces the positive externality of information, is underproduced in the market.

A. *A Model*

1. *The Wedge Between Social and Private Benefit*

Our principal claims are twofold. One, even where there are significant first-mover advantages, market experiments that would be socially useful may not be in the interest of any private party. Two, increasing the degree of market exclusivity—in effect, providing legal protection to increase the first-mover advantage—can promote social welfare by increasing the number of experiments that private parties are willing to undertake. To gain an appreciation of how large the wedge between social optimality and private incentives might be, let us consider a simple model, which we will develop by starting with the following baseline set of assumptions. A new business concept may end in success or failure. If it ends in failure, the first entrant’s entire startup cost (assume for now \$1,000,000) will be lost. If it is successful, then there will be some gross social benefit from the experiment

⁵⁶ *Abrams v. United States*, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting).

⁵⁷ SCHUMPETER, *supra* note 25, at 83.

⁵⁸ See *supra* note 12 and accompanying text. For an analysis of the implications of inefficient entry in the copyright context, see generally Michael Abramowicz, *An Industrial Organization Approach to Copyright Law*, 46 WM. & MARY L. REV. 33 (2004).

(assume \$5,000,000). Some portion of this social benefit (assume 50%) will be captured by the combination of the first entrant and the subsequent entrants, while consumers will capture the rest by paying less for the service provided than the maximum that they would be willing to pay. Additional businesses may enter the market if the concept is successful, for some cost (assume \$1,000,000 for this cost also). The number of businesses that will enter is the maximum possible without producing losses.⁵⁹

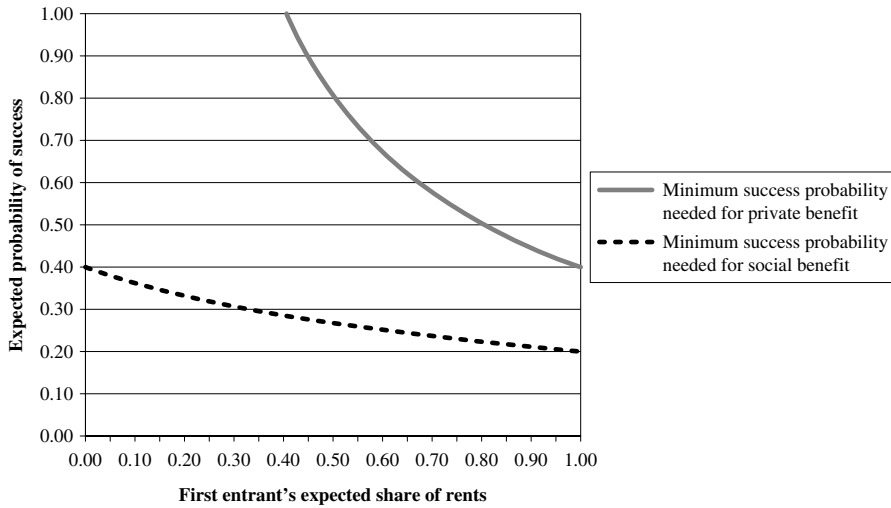
The first entrant will capture some expected share of the rents, while the other entrants share the remaining rents.⁶⁰ Let us suppose, for example, that the first entrant expects to be able to capture 60% of the rents if the experiment is successful, while all other entrants would share the remaining 40%. (The 60/40 split between the first and subsequent entrants is an arbitrary one, but it does represent a case in which the first entrant enjoys a considerable first-mover advantage over all subsequent entrants.) Because we have assumed that consumers capture half of the social benefit, the total rents available to all potential entrants are \$2,500,000. The first entrant's expected rent *in the event of success* is \$1,500,000, so the first entrant's expected profit would be \$500,000. The market would then support one additional entrant, and the net social benefit would be \$3,000,000 (the \$5,000,000 in gross social benefit minus the total entry costs of \$2,000,000). In the event of failure, the first entrant's loss would be the full \$1,000,000 cost of the market experiment. If there is at least a 25% chance of success, then this experiment will be socially beneficial because the expected social benefit ($1/4 \times \$3,000,000$) will just equal the expected cost from failures ($3/4 \times \$1,000,000$). From the perspective of the potential first entrant, however, there must be at least a 66 $\frac{2}{3}$ % chance of success to make the experiment worthwhile. At that level, the expected private benefit of success ($2/3 \times \$500,000$) equals the expected private cost of failure ($1/3 \times \$1,000,000$).

⁵⁹ To simplify the diagrams, our model allows a fractional number of additional firms to enter the market once one firm has entered. This can be conceived of in expected value terms, so that the entry of 2.5 firms could be interpreted as equal probabilities that 2 or 3 firms will enter the market. The step function discontinuity would needlessly complicate the analysis, and allowing for only integral entry would not change any of our conclusions. A spreadsheet that can be modified to view the graphs here, as well as variations on each of them in the absence of fractional entry, is available. Michael Abramowicz & John T. Duffy, *Experimentation Model* (2007) (unpublished spreadsheet, on file with authors and the New York University Law Review).

⁶⁰ In referring to "rents" here, we mean to include all returns that exceed the firms' operating costs, including opportunity costs, once they have entered the market. These rents may include quasi rents, which represent merely ordinary economic returns on the sunk-cost investments necessary to enter the market.

Figure 1 considers the full range of possible values of the first entrant’s expected share of the rents. The first entrant can receive a proportion of anywhere from 0 (in which case success is no better than failure) to 1.0 (monopoly). The graph illustrates the minimum expected probability of success that will be needed for the experiment to be socially and privately beneficial for different possible values of the first entrant’s expected share. The x-axis reports the first entrant’s expected share of rents (in present discounted value), while the y-axis reports the minimum expected probability of success necessary for a private benefit and a social benefit. As one would anticipate, the private benefit curve has a downward slope; with a higher expected proportion of the rents, a lower success probability will be sufficient to induce market entry. Thus, as the first entrant enjoys a greater first-mover advantage (either because of market conditions or legal protections), more risky but nonetheless socially valuable experiments will occur. There is also a slight downward slope to the social benefit curve. This is because when the share of the rents enjoyed by the first entrant rises, there is less duplicative expenditure for entry by additional entrants.

FIGURE 1
 PROBABILITY OF SUCCESS NEEDED FOR EXPERIMENTATION
 TO BE SOCIALLY AND PRIVATELY BENEFICIAL



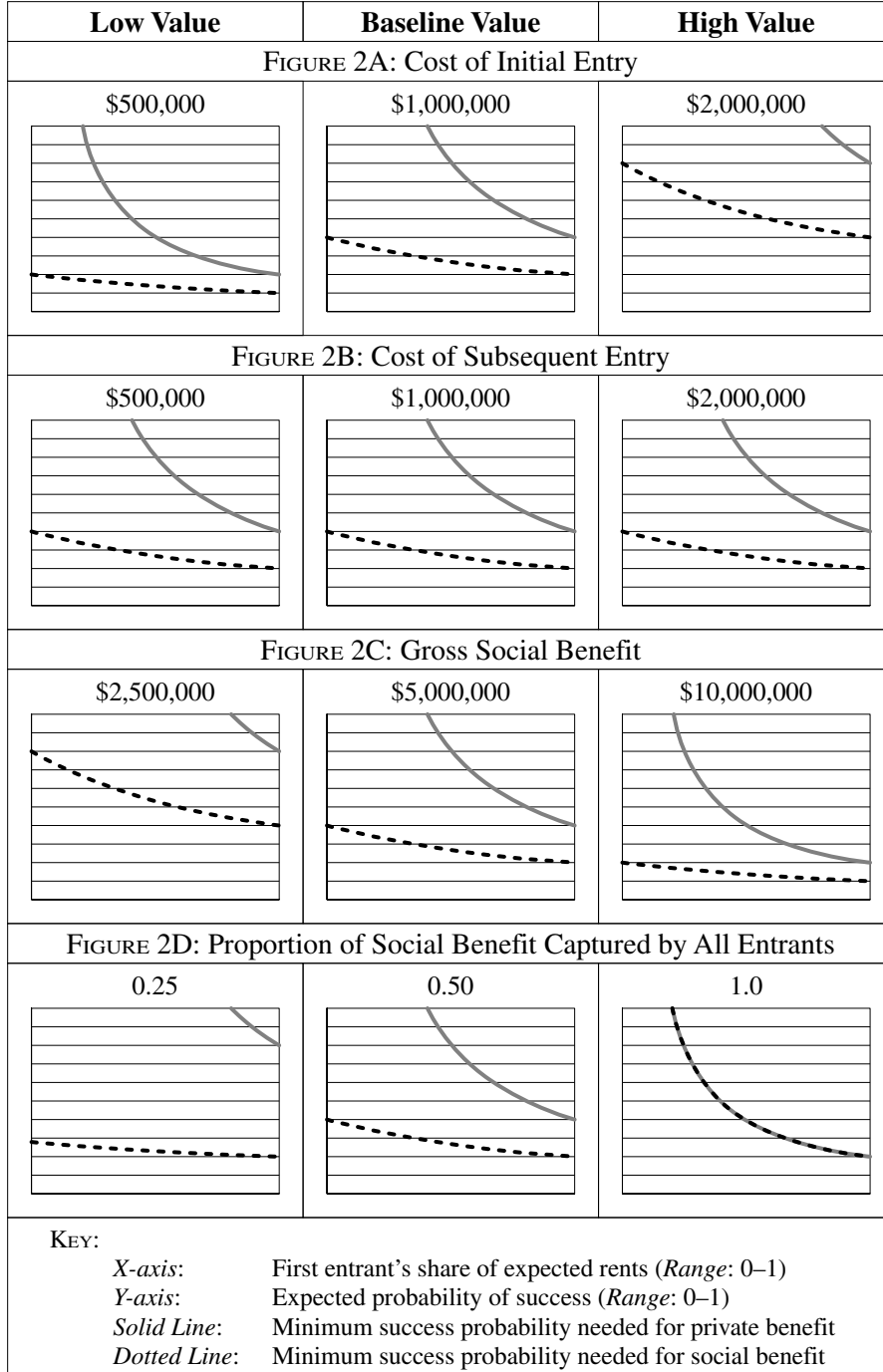
The gap between the social success line and the private success line reveals the market failure. Continuing the previous example, if the expected probability of success is anywhere between 25% and 66²/₃%, the experiment will be socially worthwhile but will not be

attempted. For expected probabilities of success below 25%, the market failure makes no difference because the experiment will be neither socially nor privately worthwhile. For expected probabilities of success above 66 $\frac{2}{3}$ %, it also makes no difference, as the private party will undertake the experiment and it will be socially beneficial. Whether a market failure occurs thus depends upon the first entrant's expected share of the rents and the expected probability of success. The overall magnitude of this type of market failure across the economy depends upon the distribution of these numbers across all potential projects. If we live in a world in which all potential projects have either very low or very high probabilities of success and in which the first entrant's expected share of rents is sufficiently high, then the market failure might seem likely to make little difference. Of course, empirical measurement is impossible—there is no way to identify all of the potential projects that no one undertakes—but it seems plausible that there are many potential projects in the range of the middling probabilities.

Our model is relatively simple, but our fundamental conclusion so far—that a considerably higher expected probability of success is needed to make experimentation privately feasible than to make it socially beneficial—is relatively robust to our assumptions. Figure 2 illustrates the effect of changing many of the numeric parameters. As shown in Figure 2A, reducing the cost of the initial entry narrows the gap between the private and social minimum probability curves because lower initial entry costs make the cost of the experiment less worrisome, while raising the cost of the initial entry increases the gap. Decreasing or increasing the cost of entry for subsequent entrants (as in Figure 2B) does not change either effects line. Increasing the gross social benefit in the case of success (Figure 2C) decreases the gap because the upside of the experiment becomes more attractive, while reducing the gross social benefit increases the gap. The only possible change that would significantly alter our conclusions would be increasing the proportion of social benefit captured by entrants to near 1.0 (Figure 2D). At this level, rent-seeking eliminates the portion of the social benefit not captured by the initial entrant, and the private and social benefit of experimentation are virtually aligned. We find it doubtful, however, that firms will be able to achieve the perfect price discrimination that full private capture of social benefits would require.⁶¹ Reducing the proportion of social benefits captured

⁶¹ A perfect price discriminator charges each customer the maximum that the customer is willing to pay. Even a monopolist cannot ordinarily price discriminate perfectly, because no firm can know this amount precisely.

FIGURE 2
EFFECTS OF CHANGING PARAMETERS OF MODEL



by entrants (and thus increasing the portion captured by consumers) correspondingly widens the gap between private and social benefit.

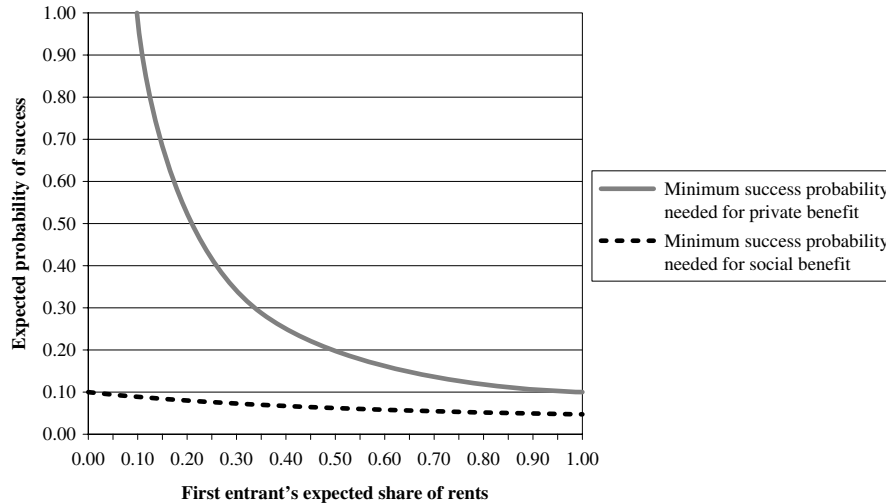
It might appear that our model is inconsistent with the common observation that many new businesses fail.⁶² There are two explanations for why risky businesses are still able to attract investment. First, investors who specialize in high-risk opportunities—venture capitalists—will be willing to tolerate high risk in fields in which first-mover advantages are strong. Thus, we would expect investors to tolerate risk in those industries with various factors—including the availability of traditional intellectual property rights like patents, copyrights, and trademarks—that provide significant first-mover advantages; in fact, high-tech entrepreneurs (and their investors) have developed a well-documented tolerance for failure.⁶³ Second, projects having high social and private benefits also will be able to attract capital, even without strong first-mover advantages. Consider Figure 3. In this Figure, the cost of initial entry is \$5,000,000, the cost of subsequent entry is \$3,000,000, and the gross social benefit if the project is successful is \$100,000,000. Even if the first entrant is expected to earn only a third of the available private rents if success occurs, investing in the first mover should be profitable even if the likelihood of success is well below 50%. Thus, we do not deny that, under the current legal regime, risky entrepreneurial businesses will be funded under certain industry conditions and for certain high-value projects. Our point is merely that encouraging even more risky entrepreneurial activity might be socially beneficial.

This point might appear to be an incomplete answer to the objection. In our model, venture capitalists would fund all projects over the private benefit line, and so it might seem that many of these projects would have high expected probabilities of success and that only a few would be close to the break-even point. But high probability projects are not likely to exist often, because some venture capitalist will have funded them earlier, when they were only slightly above the private

⁶² Venture capitalists select investments with a high possibility of return but also take large risks with the investments. See Tyzoon T. Tyebjee & Albert V. Bruno, *A Model of Venture Capitalist Investment Activity*, 30 *MGMT. SCI.* 1051, 1052 (1984) (noting that venture capital funds have higher rate of return than S&P 500 but are considerably riskier). Because venture capitalists invest in businesses that are in or close to the start-up phase, they cannot use prior histories to evaluate the possibility of success of each business. *Id.* at 1051. Venture capitalists are willing to accept the fact that many of their investments fail because the investments that succeed make huge profits. *Id.* at 1052.

⁶³ See, e.g., Augustin Landier, *Entrepreneurship and the Stigma of Failure* 6 (Dec. 13, 2004) (unpublished manuscript, on file with the New York University Law Review), available at http://www1.worldbank.org/finance/assets/images/stigma9_augustinlandier.pdf (“Silicon Valley’s entrepreneurship is characterized by an exceptional climate of tolerance for failure . . .”).

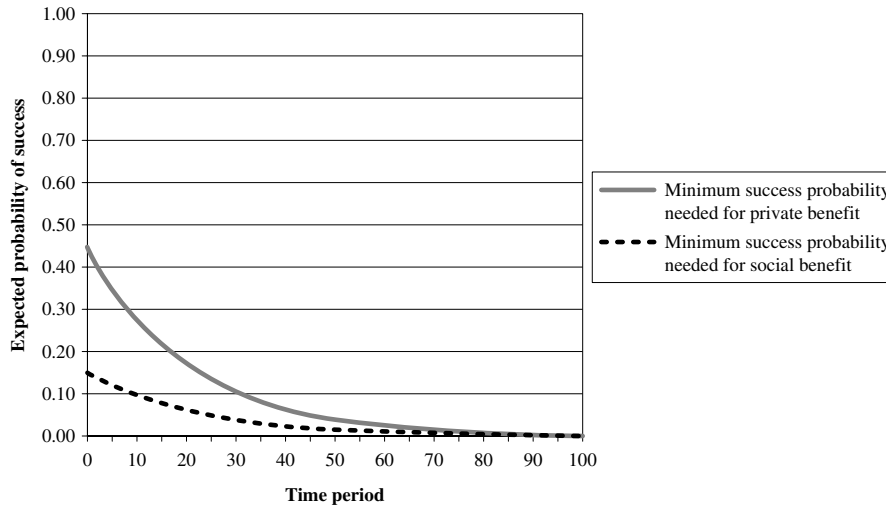
FIGURE 3
 PROBABILITIES OF SUCCESS NEEDED WHEN
 POTENTIAL PAYOUT IS VERY HIGH



benefit line. Shifting from a static to a dynamic model makes this point clearly. Let us suppose that if a project is successful in year 0, the gross social benefit will be \$500,000 in that year (rising 5% each year) with a discount rate of 10%. The market experiment will still occur eventually, but it will be delayed. Figure 4 illustrates this. The x-axis is now time, and the variable previously on the x-axis, the first entrant's expected share of rents, is now assumed to be 0.5. The precise amount of delay depends upon the expected probability of success; if, for example, the probability were 0.1, then the experiment will occur twenty years too late. Our conclusion that entry will tend to occur inefficiently late is robust to plausible changes in the parameters.⁶⁴

⁶⁴ This result is in contrast to an existing dynamic model of sequential entry in a growing market. See David E. Mills, *Untimely Entry*, 39 J. INDUS. ECON. 659, 660 (1991) (outlining model and noting its prediction that entry tends to be premature). In Mills's model, a firm will enter when it anticipates that entry will be profitable, taking into account all of the decisions by subsequent entrants. *Id.* at 662-63. Mills's model shows that from a social perspective, entry can be premature or tardy. *Id.* at 660. The intuition underlying premature entry is that an entering firm knows that no other firm will enter until demand has grown sufficiently to make entry worthwhile. While the firm might wait if it had a property right that allowed it to do so, the benefit of deterring entry by other firms may make early entry worthwhile. See *id.* at 660 (discussing trade-off between early entry and being preempted). The entrant accepts early losses for higher profits in a later period. Mills's analysis assumes, however, that potential entrants know the level of demand. See *id.* at 661 (defining inverse demand function). At least when demand is highly uncertain, premature entry seems unlikely to occur, though the benefit of deterring subsequent

FIGURE 4
 DELAYED MARKET EXPERIMENTATION IN A
 DYNAMIC MODEL



2. *The Effect of Intellectual Property Protection*

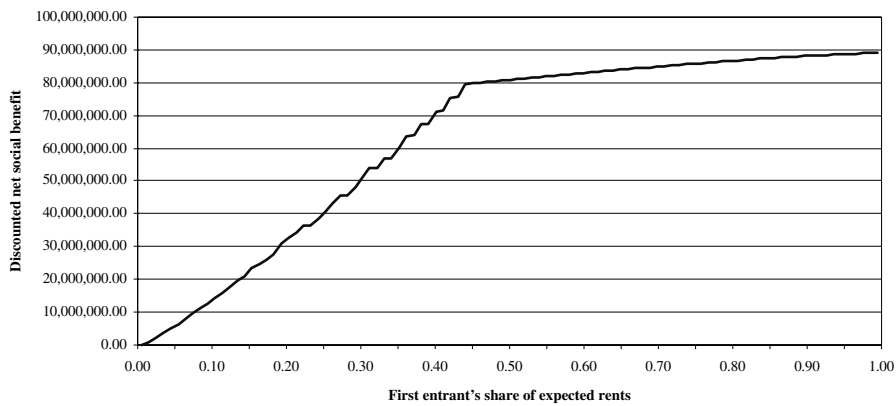
A principal effect of intellectual property protection is to increase the first entrant’s expected share of the rents. This is so for two reasons. First, exclusivity provided by intellectual property rights guarantees at least a limited period of time during which the entrant faces no direct competition, thus increasing the first entrant’s expected share of rents in terms of present discounted value. Second, the head start provided by an exclusive right may allow the first entrant to maintain a larger market share even after the limited term ends. Moving to the right on the x-axes in Figures 1, 2, and 3 narrows the gap between private and social benefit, the latter of which falls slowly as a result of the decrease in rent-seeking associated with reduced entry. For relatively small expected market shares, a private party will be unwilling to undertake the experiment even if success is ensured, but as expected rents approach the monopoly level, experimentation becomes increasingly feasible.

It might appear that the conclusion that greater intellectual property rights will increase experimentation flows from a simplification in our model, namely the assumption that the gross social benefit is fixed regardless of the expected share of rents of the first entrant. After all,

entrants for a time in the event of modest success may, to some extent, reduce the wedge between the private and social benefits of entry.

a central drawback of intellectual property rights is that they increase deadweight loss, as higher prices mean that some who value goods over marginal cost nonetheless will not purchase them.⁶⁵ Indeed, we agree that a principal cost of increasing the first entrant's expected share of rents is this deadweight loss. Accounting for the negative effect of market power on social benefit, however, does not diminish the point that there will be a gap between private and social incentives for experimentation. Figure 5 illustrates this gap, calculating discounted net social benefits for different market shares of the first entrant. In addition to the assumptions of the dynamic model in Figure 4, this graph reflects that, as the market share of the first entrant increases from 0 to 1.0, deadweight loss consumes up to 40% of the gross social benefit, and the proportion of social benefit captured by all entrants, rather than by consumers, increases from 0.5 to 0.75.

FIGURE 5
NET SOCIAL BENEFITS AS A FUNCTION OF FIRST ENTRANT'S
EXPECTED SHARE OF RENTS, WHERE INCREASE IN FIRST
ENTRANT'S SHARE OF EXPECTED RENTS INCREASES DEADWEIGHT
LOSS AND PRODUCERS' SHARE OF SURPLUS



In Figure 5, the social benefit from experimentation rises consistently with increases in the first entrant's expected share of rents, although the increase levels off somewhat when the expected share exceeds 45%. Given that this Figure reflects a relatively pessimistic

⁶⁵ The argument that intellectual property generally creates deadweight losses is well accepted in the literature. See, e.g., Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX. L. REV. 1031, 1059 (2005) (“By definition . . . the intellectual property system permits owners to raise price above marginal cost, creating deadweight losses by raising the price to consumers.”).

assumption about deadweight loss, it appears likely that the dynamic benefit of intellectual property for market experimentation (more experimentation) will outweigh the static cost (higher prices and lower output) in expected value terms. That does not necessarily mean, however, that increases in intellectual property for market experimentation will always be justified. There may be other costs of high expected rent shares besides the short-term deadweight loss, including losses from political rent-seeking⁶⁶ and a reduction in downstream market experimentation.⁶⁷ Let us suppose that these losses, plus the deadweight loss, equal 60% of the gross social benefit from experimentation as the first entrant's market share approaches the monopoly level of 1.0. Then, past a certain point, increases in expected rent shares will decrease social welfare, as illustrated in Figure 6.

This suggests that any institution that seeks to grant intellectual property for market experimentation must seek to limit the total costs of monopoly. An especially cautious approach would embrace intellectual property only where market experimentation seems highly unlikely to occur in its absence over the entire period of the intellectual property right.

B. Caveats

1. Cognitive Factors

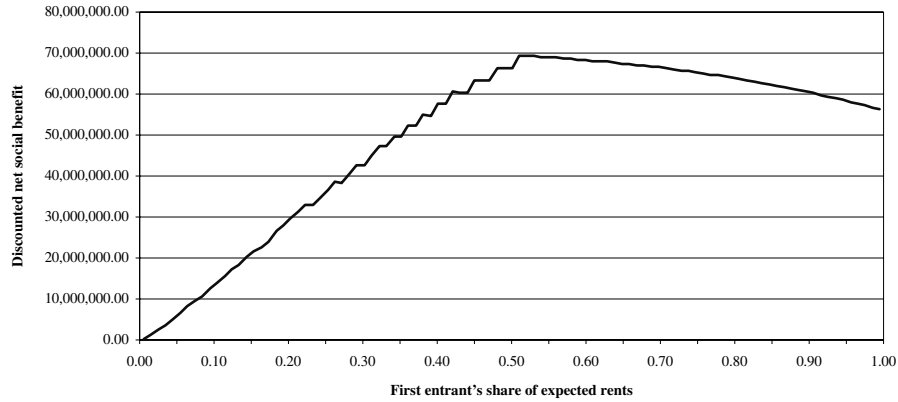
In our analysis above, we assumed that although the prospective entrepreneur does not know whether a particular project will be successful, he accurately measures its probability of success. Behavioral economics, however, suggests that many economic actors are overconfident about their probability of success in many endeavors, including business. Studies suggest, for example, that failure rates of new entrants are high,⁶⁸ and some have even suggested that, on average,

⁶⁶ Richard Posner has argued that political rent-seeking can be "a larger source of social costs than private monopoly." Richard A. Posner, *The Social Costs of Monopoly and Regulation*, 83 J. POL. ECON. 807, 807 (1975). For the classic articles introducing the problem of rent-seeking, see generally Anne O. Krueger, *The Political Economy of the Rent-Seeking Society*, 64 AM. ECON. REV. 291 (1974), and Gordon Tullock, *The Welfare Costs of Tariffs, Monopolies, and Theft*, 5 W. ECON. J. 224 (1967).

⁶⁷ Critics of the current patent system argue that the rising cost of litigation and the declining quality of patents issued by the U.S. Patent and Trademark Office have resulted in uncertainty and have therefore deterred investment in innovation and intellectual property. See COMM. ON INTELLECTUAL PROP. RIGHTS IN THE KNOWLEDGE-BASED ECON., NAT'L RESEARCH COUNCIL OF THE NAT'L ACADEMIES, *A PATENT SYSTEM FOR THE 21ST CENTURY* 95 (Stephen A. Merrill et al. eds., 2004).

⁶⁸ See, e.g., David de Meza & Clive Southey, *The Borrower's Curse: Optimism, Finance and Entrepreneurship*, 106 ECON. J. 375, 377 (1996) (reporting "extremely high drop out rates" for new entrepreneurs in both United States and Britain).

FIGURE 6
 SOCIAL BENEFIT WHERE DEADWEIGHT AND OTHER
 LOSSES APPROACH 60% AS FIRST ENTRANT
 APPROACHES MONOPOLY



entry tends to produce negative economic returns.⁶⁹ Of course, these conclusions are based on private returns rather than social returns. Our analysis suggests that entrant overoptimism may be socially beneficial because it will tend to reduce the wedge between private and social benefit seen in Figures 1 and 2.

Entrant overconfidence may thus reduce the benefits of intellectual property, but we doubt that this problem is sufficiently large to undermine our general argument in any significant way. Although some individuals start businesses with their own money, many individuals use external sources of financing. Financiers have incentives not to be overly confident about the likelihood of success, and there is considerable evidence of realism from the venture capital side with regard to concerns of imitation in the market.⁷⁰ The gatekeeping function of venture capitalists thus prevents many individuals from

⁶⁹ See, e.g., Avishalom Tor, *The Fable of Entry: Bounded Rationality, Market Discipline, and Legal Policy*, 101 MICH. L. REV. 482, 490–92 (2002) (arguing that high attrition rates and poor market penetration by new entrants cause negative net economic impact).

⁷⁰ See de Meza & Southey, *supra* note 68, at 375 (noting that banks may have better access to unbiased information than do entrepreneurs); *id.* at 377 (citing data showing that firms having financing—especially unsecured financing—fail less frequently than businesses self-financed by entrepreneurs); see also Gary Rivlin, *Relax, Bill Gates; It's Google's Turn as the Villain*, N.Y. TIMES, Aug. 24, 2005, at A1 (“When I meet with venture capitalists, or if I’m engaged in a conversation about going into partnership with someone, inevitably the question is, ‘Why couldn’t Google do what you’re doing?’”); Rob Landley, *A Look at Microsoft’s Record: Can It Continue This Way?*, THE MOTLEY FOOL, Nov. 18, 1998, <http://www.fool.com/CashKing/1998/CashKingPort981118.htm> (“These days, even venture capital is drying up for any new projects that might, conceivably, someday compete Microsoft [sic].”).

launching quixotic business ventures or from continuing them with the support of follow-on financing. The possibility of entrant overconfidence may thus be greatest for projects that do not receive venture capital but that instead are financed by entrepreneurs, along with family and friends. Such projects tend to have lower market-entry costs, which our model predicts will have higher rates of failure to begin with.

2. Demand Diversion

So far, we have assumed that the market into which the entrepreneur is considering entering is entirely isolated from other markets. Virtually all products and services, however, are at least partial substitutes for other goods and services. A new product or service will owe part of any success it achieves to customers who otherwise would have purchased other products and services. In the industrial organization literature on product differentiation, this phenomenon is called “demand diversion,”⁷¹ or, more vividly, “business stealing.”⁷² More commonly, this is simply called competition, but the economic literature on imperfect competition shows that competition does not automatically produce optimal entry.⁷³ The literature demonstrates that because market entrants often do not take into account the effect of their entry on others already in the market, it is possible that there will be insufficient entry or excessive entry into new markets.⁷⁴ If there is excessive entry into a market, then intellectual property protection will have two competing effects. On the one hand, such protection may reduce subsequent entry, potentially improving efficiency; on the other, it may increase the attractiveness of the creation of a new, differentiated product that would receive protection, thereby potentially reducing efficiency.

Both of these competing effects are visible in Figure 7. This Figure reflects, in addition to the assumption of Figure 5, the assumption that 75% of what is counted as social benefit in Figure 5 should not be so counted, for it merely reflects diversion of economic activity from elsewhere in the economy. With this pessimistic assumption, there is excessive, rather than inadequate, entry, and an increase in the share of rents earned by the first entrant initially causes progres-

⁷¹ See, e.g., Christopher S. Yoo, *Copyright and Public Good Economics: A Misunderstood Relation*, 155 U. PA. L. REV. 635, 697 (2005) (defining “demand diversion” as “surplus cannibalized from other producers already in the market”).

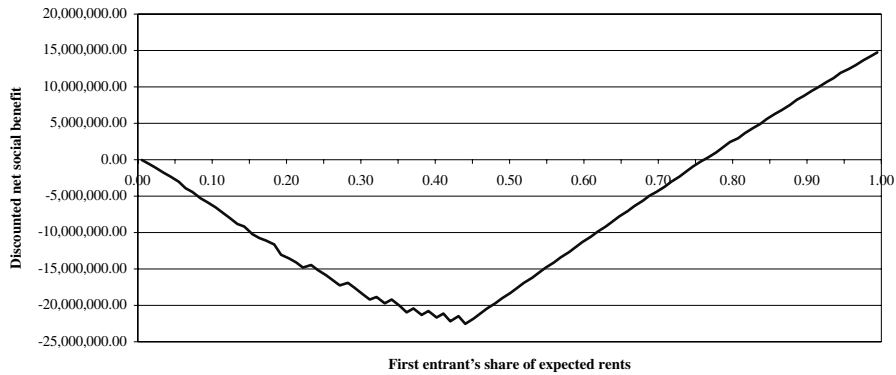
⁷² See, e.g., Abramowicz, *supra* note 58, at 39 (defining “business stealing” as equivalent to demand diversion).

⁷³ See *supra* note 12 and accompanying text.

⁷⁴ See *supra* note 12 and accompanying text.

sively greater social losses. Past a certain point, however, cost savings are obtained by virtue of a reduction in subsequent entry, and at some point the market experiment becomes socially beneficial rather than harmful. Extreme demand diversion can, in sum, potentially complicate the case for protecting market experimentation. Ideally, an institution granting intellectual property rights for market experimentation would be attentive to this concern.

FIGURE 7
SOCIAL BENEFIT WITH HIGH DEMAND DIVERSION



C. *Types of Market Experimentation*

So far, our model has been mostly abstract, identifying a benefit of market experiments without specifying the type of market experiments we might wish to encourage. In this section, we discuss four different types of experiments: launching a new type of good or service (a new product market), creating a new variety of an existing good or service (a new product feature), reforming an organizational or supply chain (a new supply-side approach), and selling an existing good or service in a new location (a new geographical market).

1. *New Product Markets*

Suppose that the year is around 1997, and a venture capitalist is listening to Reed Hastings pitch a company that he hopes to launch.⁷⁵ The company, to be called Netflix, will rent DVDs by mail, sending them in envelopes to subscribers who select movies over the Internet. Hastings initially plans to rent DVDs to customers for a fixed price for a set period of time, but eventually he may offer a deal in which sub-

⁷⁵ For background on Netflix, the company Hastings launched and the basis for this example, see generally Gary Rivlin, *Does the Kid Stay in the Picture?*, N.Y. TIMES, Feb. 22, 2005, at G1.

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scribers can rent an unlimited number of movies for a fixed fee so long as they have no more than a certain number out at any given time. The venture sounds risky. DVDs themselves are not yet a firmly established technology, and they might break or get scratched when shipped in flimsy envelopes in the mail. Consumers might prefer the spontaneity of a visit to the video store over ordering a movie for a later time. Late fees, on which video rental stores have traditionally made a great deal of money, will not be a revenue source. Building a distribution center in which to process the envelopes could be expensive, and ideally there would be multiple distribution centers to minimize shipping time. Subscriber-based businesses typically take a long time to build, and yet the technology may have little long-term viability given the continued expansion of broadband capacity and video-on-demand services.

Worst of all, imagine that this new business manages to overcome all of these obstacles. Its success and happy customers would be difficult to hide. Competitors could then jump into the business; indeed, they might have significant advantages over Netflix. The Blockbuster video chain, for example, might be able to undercut Netflix by exploiting its existing relationships with movie studios. Blockbuster might also take advantage of its many individual store locations by sending DVDs from them, thereby reducing the time of mail delivery, or by offering subscribers a chance to rent videos at Blockbuster's brick-and-mortar stores as part of a package. Retailing giants, rich in customer brand recognition and relationships, also might compete. Wal-Mart might be able to destroy Netflix in much the same way that it outmuscles small retailers. Massive online retailers, like Amazon.com or Dell, might crush Netflix simply by executing the concept more effectively.⁷⁶ Consequently, a back-of-the-envelope calculation might be that there is only a one-in-three chance that the Netflix concept will initially be successful and, further, a one-in-three chance of maintaining a sufficient market share to be more than marginally profitable. With an initial cost of perhaps \$100,000,000 and small margins on each potential subscriber, the best-case scenario

⁷⁶ Critics have argued that Michael Dell, Dell's founder, succeeds by identifying the best business models and then simply executing them better than the models' originators. See Andrew Park & Peter Burrows, *Dell, the Conqueror*, Bus. Wk., Sept. 24, 2001, at 92, 94 (noting that Dell's "brilliance" is in "identifying innovative business models" and "executing them to perfection," not in creating "whiz-bang inventions"). Improving execution of existing ideas is an important type of innovation in itself, but such business practices may discourage others from creating new business models at all. If property rights in new business models existed, then those with the best ideas could consolidate their efforts with those best capable of conducting experiments and with those best able to execute the models that have proven, at least preliminarily, to be successful.

would require a multibillion-dollar consumer market for the investment to be worthwhile in expected value terms.

Because Netflix emerged as successful despite the long odds against it, it might seem to be a poor example with which to advance our thesis. But in fact, Netflix highlights both the importance of having some protection against second movers and the riskiness of new businesses, even those that become highly successful. Netflix faced many of the uncertainties that plague any new entrant and that provide an advantage to second movers: uncertainty about demand (would consumers be interested?), uncertainty about supply (how expensive would it be to turn around DVDs?), and uncertainty about competition (would incumbents have cost advantages?). However, the business that Netflix sought to create may also have enjoyed some important practical and legal first-mover protections. Once Netflix built large distribution centers, it was difficult for other start-up competitors to compete in terms of selection and delivery time. Moreover, Netflix also enjoyed other network effects and positive consumer associations with its brand name.⁷⁷ Now, Netflix's large installed customer base⁷⁸ may make a customer more likely to choose it than an alternative, both because Netflix is likely to be the first company that comes to mind and because the large customer base may improve the usability of the Netflix product.⁷⁹

In addition, Netflix sought and obtained some broad and controversial patents on its business methods.⁸⁰ These patents may have given investors some additional degree of confidence that Netflix could hold off the competition long enough to earn sufficient profits

⁷⁷ See Nicholas Thompson, *Netflix Uses Speed to Fend Off Wal-Mart Challenge*, N.Y. TIMES, Sept. 29, 2003, at C1 (noting entry of Wal-Mart into market but noting that Netflix enjoys "a big lead in customers, revenue and brand recognition"); Associated Press, *A Second Look: Netflix Peaks for 2nd Day*, BUS. WK., Feb. 28, 2008, <http://www.businessweek.com/ap/financialnews/D8V3G7601.htm> (explaining Netflix's recent rise in stock price by noting that "the company may be seeing a tipping point in terms of brand recognition and subscriber growth"); Jennifer Bayot, *Netflix Takes Over Wal-Mart's Online DVD Rental Business*, N.Y. TIMES, May 19, 2005, <http://www.nytimes.com/2005/05/19/business/media/19cnd-movie.html> (observing that Wal-Mart had "copied" Netflix's business model but documenting that Netflix had nonetheless triumphed).

⁷⁸ Netflix is the "largest online movie rental subscription service" with over 6,300,000 subscribers. Netflix, Inc., Annual Report (Form 10-K), at 1 (Feb. 28, 2007).

⁷⁹ For example, having more customers may have enabled Netflix to develop a better database from which to make product recommendations for future customers based on collaborative filtering.

⁸⁰ See Nicholas Thompson, *Netflix's Patent May Reshape DVD-Rental Market*, N.Y. TIMES, June 26, 2003, at C4 (noting that "some analysts question whether Netflix's innovation" was obvious and thus unpatentable); see also Method and Apparatus for Renting Items, U.S. Patent No. 6,584,450 (filed Apr. 28, 2000); Approach for Renting Items to Customers, U.S. Patent No. 7,024,381 (filed May 14, 2003).

to justify the risky investment; in fact, Netflix did resort to suing on its patents when Blockbuster attempted to enter its market.⁸¹ Yet Netflix's patents were sought and obtained prior to recent Supreme Court and Federal Circuit rulings that have made it more difficult to obtain patents on technologically obvious business methods,⁸² and the Netflix patents themselves were controversial precisely because they seemed to cover a technologically obvious process (providing DVDs by mail).⁸³ We have two views on the Netflix patents. In general, we support limiting patents to nonobvious developments, and we are skeptical that Netflix's patents could survive scrutiny under the updated patent law standards. On the other hand, we believe that Netflix's launch of its business was truly risky, and therefore we think that Netflix's patents, though they are of doubtful validity under traditional analysis, may have been socially useful in encouraging market experimentation.

The Netflix example also advances our thesis because it is an example of a business that easily might not have existed but for the possibility of sufficient legal and nonlegal first-mover advantages, as well as the persistence of its multimillionaire founder, who could personally afford to capitalize the initial business and who had a sufficient track record of success that he could attract venture capital (albeit not without difficulty) as the business was developing.⁸⁴ We cannot identify with certainty business ideas that would have been successful if only they had been implemented, but we can show that even businesses that proved to be phenomenally successful may at one time have appeared to be marginal projects or likely losers. Even after Netflix took off against the odds, there were many analysts in 2002 and beyond who doubted that it would be able to survive competition

⁸¹ See Monica Sanders, *Why Is Netflix Suing Blockbuster?*, <http://www.legalzoom.com/legal-articles/netflix-suing-blockbuster.html> (last visited Jan. 21, 2008) (discussing lawsuit). The companies settled the dispute in 2007. Reuters, *Blockbuster Settles Fight with Netflix*, N.Y. TIMES, June 28, 2007, at C12.

⁸² See, e.g., *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734–35, 1741 (2007) (overturning Federal Circuit's more liberal "teaching, suggestion, or motivation" test for obviousness); *In re Comiskey*, 499 F.3d 1365, 1380–82 (Fed. Cir. 2007) (holding that business methods may be obvious and therefore unpatentable where they merely combine unpatentable business methods with computers or other well-known technology).

⁸³ See Xenia P. Kobylarz, *Netflix Screens Patent Controversy*, INTERNET L. & STRATEGY, May 2006, http://www.lawjournalnewsletters.com/issues/ljn_internetlaw/4_5/news/146548-1.html (noting that Netflix-Blockbuster patent suit "highlights the ongoing debate over Internet business-method patents").

⁸⁴ See Reed Hastings as told to Patrick J. Saver, *How I Did It: Reed Hastings; The Envelope, Please*, INC., Dec. 2005, at 118, 119 (disclosing that Hastings sold his prior start-up company in 1997 for \$750 million, giving him "the means to start Netflix"); see also Rivlin, *supra* note 75 (reporting that many venture capitalists rejected entreaties of Netflix's founder, Reed Hastings, for funding).

from Blockbuster and Wal-Mart.⁸⁵ Moreover, Netflix's own disclosures of market data during its 2002 initial public offering have been blamed for attracting Blockbuster and Amazon.com as competitors, showing that competitors do try to free ride on the market experiments of other firms.⁸⁶

Compounding the uncertainty that first movers like Netflix face is the danger that second and subsequent movers may free ride on their marketing and other promotion efforts. Even if Netflix was sure that consumers could be persuaded that it makes sense to rent DVDs by mail, such persuasion might be expensive. Once Netflix persuades consumers that the business concept is worthwhile, some of those consumers may so closely associate Netflix with the concept that they will not seriously consider competitors.⁸⁷ Other consumers, however, may research competitors and choose lower-cost options. In our framework, the need to engage in marketing may make the entry cost for a first mover higher, thereby increasing the wedge between private and social benefit. A similar analysis applies to a case in which a first entrant will need to spend money on lobbying. One obstacle to supersonic travel, for example, is the federal regulation of aircraft noise.⁸⁸ Even if a particular company thinks that it can persuade Congress to change the rules, subsequent entrants may be able to free ride on that benefit. We recognize, of course, that advertising and lobbying sometimes may be inefficient,⁸⁹ but there are at least some circumstances in

⁸⁵ E.g., Martin Peers & Nick Wingfield, *Blockbuster Set To Offer Movies by Mail—Rental Giant's Shift in Approach Expected To Keep Prices Low; A Netflix Binge for \$19.95*, WALL ST. J., Feb. 11, 2004, at D1 (noting that Blockbuster poses considerable threat to Netflix due to convenience of its stores); Ann Zimmerman et al., *Wal-Mart To Start Subscription Plan for Renting DVDs*, WALL ST. J., Oct. 16, 2002, at D12 (reporting that analysts expect price wars once Blockbuster and Wal-Mart enter market).

⁸⁶ See Matthew Boyle, *Questions for . . . Reed Hastings*, FORTUNE, May 28, 2007, at 30, 30 (noting that Hastings regrets taking Netflix public in 2002 because "by publishing our financials we let Blockbuster see that this was a profitable business, and it entered two years later"); Rivlin, *supra* note 75 (same).

⁸⁷ See, e.g., Harry S. Gerla, *A Micro-Microeconomic Approach to Antitrust Law: Games Managers Play*, 86 MICH. L. REV. 892, 922–23 (1988) (noting that consumers may not choose lower price option for any number of reasons, such as acting on instinct instead of on calculation or due to personal attachment to product).

⁸⁸ No civil aircraft may exceed Mach 1 unless authorized for testing, and no sonic boom may reach the surface of the United States. 14 C.F.R. § 91.817 (2007); *id.* pt. 91, app. B.

⁸⁹ See, e.g., Jules Backman, *Is Advertising Wasteful?*, J. MARKETING, Jan. 1968, at 2 (summarizing and discussing both sides of debate over efficiency of advertising). One argument against the efficiency of advertising is that monopolists may use it to protect their market positions. See Jeffrey M. Netter, *Excessive Advertising: An Empirical Analysis*, 30 J. INDUS. ECON. 361, 361 (1982) (discussing literature on use of advertising to create barriers to entry). Our argument indicates that such advertising could be efficient in some cases, though perhaps second-best relative to a regime in which government directly protects market innovators.

which these activities can provide information that ultimately raises social welfare,⁹⁰ and intellectual property protection can increase the likelihood of such activities.

2. *New Product Features*

In a similar way, the introduction of new product features can be hampered by the fear of immediate imitation. A producer faces many of the same uncertainties about demand, supply, and competition when considering the introduction or development of a particular product feature. If the WordPerfect word processing program included a new feature that proved to be popular among users—say, an improved search feature allowing the user to search for portions of a document containing a number of words not necessarily in order, as on search engines like Google—then Microsoft might incorporate that feature as well in its competing Word program. One would not expect this to stop innovation altogether, in part because introduction of a new feature gives the innovator a lead-time advantage. A software company with a successful new feature may be able to gain market share while others take time to catch up. Nonetheless, a lagging company may be wary of introducing new features that it expects the market leader to be able to incorporate quickly, while the leader would only have the incentive to innovate to induce its customers to buy new versions of the same program.

The inability of an entrepreneur to secure the full benefits of a market experiment with new product features can help explain why some seemingly obvious product features take so long to emerge. A possible example of this phenomenon is luggage with wheels, a feature that came into common use only in the late twentieth century.⁹¹ The idea that adding wheels to luggage might be useful is old in the art. Consider Figure 8, an illustration from a 1914 patent for a device that secured wheels to a suitcase.⁹² Even such a patent would provide little market exclusivity, given the myriad of other ways that one might

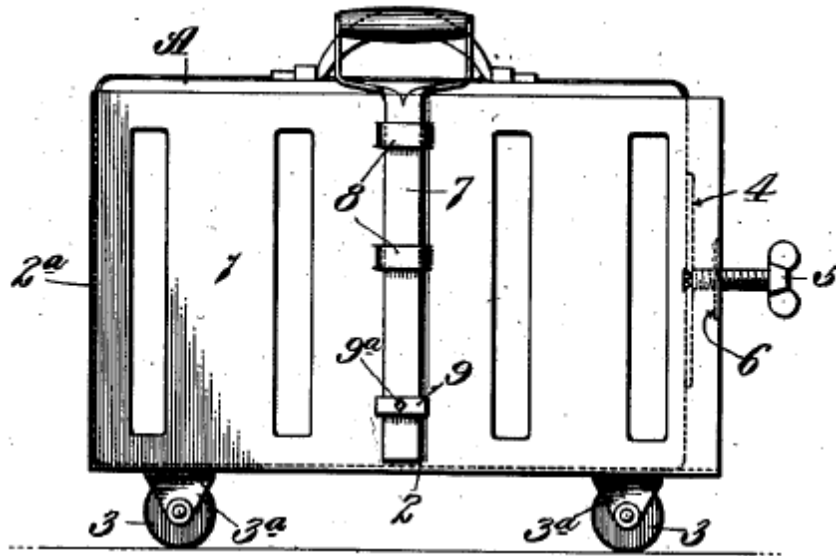
⁹⁰ See, e.g., Phillip Nelson, *Information and Consumer Behavior*, 78 J. POL. ECON. 311, 321–23 (1970) (noting that advertising can provide consumers with useful information).

⁹¹ The practical transition to wheeled suitcases began in the 1970s but was not accomplished fully until the early 1990s. See, e.g., Betsy Wade, *Luggage Takes New Turns*, N.Y. TIMES, Sept. 17, 1995, § 5, at 4 (“Five years ago . . . only flight attendants wheeled their luggage, but now a majority of passengers do.”); see also ROBERT J. SHILLER, *THE NEW FINANCIAL ORDER: RISK IN THE 21ST CENTURY* 101–02 (2003) (noting that although transition to wheeled suitcases began in 1970s, it took many years before feature achieved wide acceptance); Samsonite Corporation, History, <http://www.samsonite.com/samsonite/about/history/> (last visited Mar. 12, 2008) (noting that Samsonite first “roll[ed] out suitcases on wheels” in the 1970s and claiming that Samsonite was responsible for “the first wheeled suitcases”).

⁹² U.S. Patent No. 1,099,933 (filed Sept. 6, 1913) (issued June 16, 1914).

attach wheels to a suitcase. (Wheels, obviously, are very old in the art.) The chief impediment to wheeled suitcases appears to have been not technological uncertainty but market uncertainty about consumer demand.⁹³ Moreover, if a market experiment with wheeled luggage proved successful, established luggage companies would surely copy the innovation. This was, of course, precisely what happened once a suitcase with wheels was finally marketed successfully.⁹⁴ While we cannot eliminate the possibility that other factors, such as technological complications, may have contributed to the delayed widespread introduction of luggage wheels, the inadequacy of incentives to engage in market experiments seems likely to have played some role.

FIGURE 8
AN ILLUSTRATION FROM A 1914 PATENT



The inability to prevent second and subsequent movers from free riding on advertising can be a problem in the product-feature context as well. Consider, for example, a national fast-food chain deciding in

⁹³ Professor Shiller documents this point through an interview with Bernard Sadow, a pioneer in bringing wheeled luggage to market in the 1970s: “Sadow recalled . . . that the idea of his wheeled suitcase encountered much resistance at first, and buyers at all the major department stores rejected the idea as unsaleable. They did not argue that the wheeled suitcase was a bad idea, only that no one would buy it.” SHILLER, *supra* note 91, at 101.

⁹⁴ See Leonard Sloane, *The Latest in Luggage: Lightweight and Mobile*, N.Y. TIMES, Dec. 16, 1989, at 52 (describing luggage with wheels as popular trend for holiday travelers and buyers in 1989); Wade, *supra* note 91 (noting addition of wheels to traditional forms of luggage).

the 1990s whether to eliminate trans fats from its menu. By then, scientific evidence had demonstrated that trans fats were harmful, but consumer awareness of the scientific research was low.⁹⁵ Perhaps with sufficient advertising, a fast-food chain could have convinced consumers of the dangers of trans fats and persuaded them to give trans-fat-free french fries a try, but even then, the experiment might have been a failure. Many fast-food health innovations, such as McDonald's McLean Deluxe, have not caught on with consumers.⁹⁶ Not only might the chain fail to draw in new customers, it might also lose customers who decide that they do not like the taste of the new offerings. Of course, if the experiment were successful, other fast-food chains would quickly copy it, so the first-mover advantages might be weak. This theory may help to explain why it took food manufacturers so long to begin introducing products with negligible amounts of trans fats. Similarly, it may also explain why automobile manufacturers had no interest in trying to develop and market cars with airbags. While the common answer to problems such as this is for the government to regulate the industry or to undertake educational campaigns to inform the public,⁹⁷ our analysis suggests that intellectual property protection might be a useful alternative. We do not contend that intellectual property rights should be available whenever there is a danger that third parties will free ride on the marketing of others.

⁹⁵ From the 1960s to the 1980s, scientific research was inconsistent as to the effects of trans fatty acids on overall health. See Marian Burros, *Now What? U.S. Study Says Margarine May Be Harmful*, N.Y. TIMES, Oct. 7, 1992, at A1 ("For years, studies about trans fatty acids were conflicting: evidence showed that they both raised and lowered cholesterol levels."). In 1990, a study published in the *New England Journal of Medicine* found that diets high in trans fatty acids had unfavorable effects on cholesterol levels. Ronald P. Mensink & Martijn B. Katan, *Effect of Dietary Trans Fatty Acids on High-Density and Low-Density Lipoprotein Cholesterol Levels in Healthy Subjects*, 323 NEW ENG. J. MED. 439, 439, 444 (1990). This finding was confirmed by follow-up studies throughout the 1990s. See Robert H. Eckel et al., *Understanding the Complexity of Trans Fatty Acid Reduction in the American Diet: Report of the Trans Fat Conference Planning Group*, 115 CIRCULATION 2231, 2232 (2007) (providing "history of trans fatty acids in health").

⁹⁶ See, e.g., Glenn Collins, *Low-Fat Food: Feeding Frenzy for Marketers*, N.Y. TIMES, Sept. 27, 1995, at D1 (discussing difficulty of profiting from low-fat fast-food products); Anthony Ramirez, *Fast Food Lightens Up but Sales Are Often Thin*, N.Y. TIMES, Mar. 19, 1991, at D1 (describing McDonald's McLean Deluxe sales as "modest to disappointing" and reporting mixed success of various healthy fast-food products).

⁹⁷ See, e.g., Note, *The Elephant in the Room: Evolution, Behavioralism, and Counter-advertising in the Coming War Against Obesity*, 116 HARV. L. REV. 1161, 1182 (2003) (describing government efforts to educate consumers about nutrition through food labeling regulations); see also Food & Nutrition Info. Ctr., Nat'l Agric. Library/USDA, *Dietary Guidelines for Americans: A Historical Overview* (Mar. 2003), <http://www.nal.usda.gov/fnic/pubs/bibs/gen/DGA.html> (describing federal government publications on nutrition guidance policy and nutrition education).

The challenge is to define the rights in a manner that encourages beneficial marketing without unduly extending exclusivity.

3. *New Supply-Side Approaches*

The success of a business depends not only upon the product being offered to customers but also upon the efficiency of the supplier's business organization. Management literature concerns itself with how to structure and operate the companies that will deliver those products.⁹⁸ Just as our modern economy has produced many innovative products and features, so too has it produced a plethora of approaches to business organization. Yet once again, this abundance does not establish a priori that we have the optimal amount of innovation in structuring and organizing business. Indeed, because it may be particularly difficult to use conventional forms of intellectual property—such as patents or trademarks—to protect organizational innovations, we should expect, in theory, that incentives to produce novel business organizations may be particularly suboptimal. We may loosely divide potential organizational innovations into two types: innovations in the processes by which a particular good or service is supplied and innovations in the organizational form.

Early nineteenth-century Canada provides an illustration of the former.⁹⁹ The upstart North West Company of Montreal challenged the established Hudson Bay Company. While the Hudson Bay Company essentially waited for animal furs and other goods to be brought to them for exchange, the North West Company established trading posts throughout Canada to maximize its ability to find valuable goods.¹⁰⁰ Within a few years, the North West Company took eighty percent of the incumbent's market share, but the Hudson Bay Company, which enjoyed a more convenient port, copied North West's unprotected innovation (trading posts) and was able to win back the market.¹⁰¹ In the absence of intellectual property protection, firms that make improvements in the supply chain can expect competitors to copy these improvements, decreasing the attractiveness of experimentation. The innovation might well have occurred earlier if intellectual property protection were available, and the ultimate failure of the North West Company may breed caution among future investors

⁹⁸ A popular book that reflects this literature is ROBERT SLATER, JACK WELCH AND THE GE WAY: MANAGEMENT INSIGHTS AND LEADERSHIP SECRETS OF THE LEGENDARY CEO (1999).

⁹⁹ For a description of this competition, see JOHN ROBERTS, THE MODERN FIRM: ORGANIZATIONAL DESIGN FOR PERFORMANCE AND GROWTH 4–12 (2004).

¹⁰⁰ *Id.* at 6–10.

¹⁰¹ *Id.* at 4–6.

who are deciding whether to back an entrepreneurial firm that seeks to challenge an incumbent with a market innovation.

Historically, improvements in the organizational form have also improved the decisionmaking, and thus the productivity, of American businesses. Alfred Chandler has explained how the “visible hand” of hierarchical management gradually arose in the early twentieth century to displace the invisible hand of the market.¹⁰² More recently, boards of directors employing collegial, consensus-based decision-making have come to occupy the central role in making corporations’ most important strategic decisions.¹⁰³ It is possible, of course, that the slow work of evolution has produced the optimal decisionmaking form, but the relative homogeneity of corporate structures today could also be the result of a lack of robust incentives for innovation.¹⁰⁴ Management scholars have predicted that low communication costs attributable to the Internet will promote the decentralization of corporate decisionmaking,¹⁰⁵ and others have suggested that “crowdsourcing”¹⁰⁶ and “social production”¹⁰⁷ may radically alter the conventional model of the firm. Some form of exclusive rights might accelerate these developments or at least lead to earlier identification of the contexts, if any, in which this approach is successful.

In the absence of exclusive rights for market experimentation, supply-side innovation will still occur. The use of trade secrets is often

¹⁰² See generally ALFRED D. CHANDLER, JR., *THE VISIBLE HAND: THE MANAGERIAL REVOLUTION IN AMERICAN BUSINESS* (1977) (arguing that management in large business enterprises, not market forces, has primary role in coordinating economic activity and allocating economic resources).

¹⁰³ See Stephen M. Bainbridge, *Why a Board? Group Decisionmaking in Corporate Governance*, 55 *VAND. L. REV.* 1, 12–41 (2002) (explaining advantages of board in corporate governance).

¹⁰⁴ Innovation in corporate law also may occur too slowly. See Michael Abramowicz, *Speeding Up the Crawl to the Top*, 20 *YALE J. ON REG.* 139, 194–205 (2003) (assessing possibility that patenting corporate law innovations might speed up competition and innovation).

¹⁰⁵ See THOMAS W. MALONE, *THE FUTURE OF WORK: HOW THE NEW ORDER OF BUSINESS WILL SHAPE YOUR ORGANIZATION, YOUR MANAGEMENT STYLE AND YOUR LIFE* 3–11 (2004) (asserting that “new information technologies” decrease communication costs and create further opportunities for corporate decentralization). For an assessment of how increased reliance on prediction markets could transform corporate governance, see generally Michael Abramowicz & M. Todd Henderson, *Prediction Markets for Corporate Governance*, 82 *NOTRE DAME L. REV.* 1343 (2007).

¹⁰⁶ See Jeff Howe, *The Rise of Crowdsourcing*, *WIRED*, June 2006, at 176, 178–79 (coining term “crowdsourcing” to describe business models that rely on unpaid amateur contributions of content and other work).

¹⁰⁷ See, e.g., YOCHAI BENKLER, *THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM* 3–7 (2006) (arguing that “networked information economy” has led to “rise of effective, large-scale cooperative” projects). Benkler generally describes projects in which the participants are not compensated financially, but social production could also take place within compensation schemes.

an effective method by which to protect supply operations because of the lower visibility of supply operations relative to new products or features.¹⁰⁸ Alternatively, third parties, such as management consultants or supply-chain and enterprise-resource-planning software manufacturers,¹⁰⁹ have incentives to improve the operation of existing businesses. Despite these sources of innovation, our model still predicts underinvestment in innovation if the new supply-side features cannot be protected by trade secrecy or are relatively easy to implement without the assistance of experienced consultants.

4. *New Geographical Markets*

The same logic applies to the introduction of a new product, new product feature, or new supply-side approach into a new geographical market. We will see below how exclusive rights historically have promoted international technology transfer,¹¹⁰ but theoretically the principle can also apply to technologically humdrum products and on a local level. Consider, for example, a decision whether to open the first Ethiopian restaurant in a small city called Podunk. There may be some question about whether Podunkians are ready for Ethiopian food, but if they turn out to like it, there might be enough market share for more than one restaurant. Once again, then, a potential trailblazing entrepreneur faces the entire downside of an initial investment but must share some of the upside with future entrants. Perhaps a cunning restaurateur will be able to expand the restaurant or quickly open a second if the concept is successful, but for some types of restaurants, the optimal economy of scale is a single restaurant so that the chef can keep careful watch over the kitchen. Even where the initial entrepreneur is incapable of expansion, an intellectual property

¹⁰⁸ For example, the supply-chain operations of Western companies in China are shrouded in intense secrecy. See James Fallows, *China Makes, the World Takes*, ATLANTIC MONTHLY, July/Aug. 2007, at 49, 60 (“In decades of reporting . . . , I have rarely encountered people as concerned about keeping secrets as the buyers and suppliers who meet in Shenzhen and similar cities. . . . Asking a Western company to specify its Chinese suppliers is like asking a reporter to hand over a list of his best sources.”). Fallows explains:

It is not easy to find the right factory, work out the right manufacturing system, ensure the right supply of parts and raw material, impose the right quality standards, and develop the right relationship of trust and reliability. Companies that have solved these problems don’t want to tell their competitors how they did so.

Id. As Liam Casey, a businessman who specializes in Chinese supply chains, explains, “Supply chain is intellectual property.” *Id.*

¹⁰⁹ These players may, in turn, be deterred from innovation by competition from other software providers. See *supra* Part II.C.1–2 (discussing issues of innovation in product and feature development).

¹¹⁰ See *infra* notes 114–17 and accompanying text (discussing British and American treatment of patents of importation).

right could encourage innovation, because the owner of a successful new restaurant concept could collect royalties from a subsequent entrant.

We doubt that the restaurant example provides the strongest example of the claim that incentives to experiment are suboptimal, in part because in some cases it may not be plausible that a geographical area possibly could support more than one restaurant featuring a certain ethnic cuisine. In addition, the experience of Ethiopian restaurants in other cities or the experience of other ethnic restaurants in Podunk may make the demand for Ethiopian cuisine in Podunk relatively certain *ex ante*. However, this point cuts both ways. Podunk's potential entrepreneur does not take into account the fact that the experiment in Podunk may provide information that will help entrepreneurs in other similar cities decide whether to open Ethiopian restaurants. It may be that no one will open a restaurant in any of several similar cities until there is evidence of success in at least one. In addition, there may still be considerable uncertainty not only about whether those opening the restaurant can execute the concept well enough for it to be successful,¹¹¹ but also about what specific innovations may be needed to make Ethiopian food palatable to Podunkians.

The desirability of public protection of entry into new geographic markets can be seen in franchising. Franchise agreements routinely include grants of geographical exclusivity to encourage entrepreneurs to experiment with entering and investing in new and uncertain markets.¹¹² The franchisor recognizes that a franchisee will be more

¹¹¹ We accept that much of the uncertainty associated with new restaurants is uncertainty about the quality of the management and the chef, but the restaurant business is not as unpredictable as commonly believed. See, e.g., H.G. Parsa et al., *Why Restaurants Fail*, 46 CORNELL HOTEL & RESTAURANT ADMIN. Q. 304, 311 (2005) (reporting that from 1996 to 1999, restaurant failure rate within first year was about 26%, not 90% as reported, and that restaurant failure rate after three years did not exceed 60%); Kerry Miller, *The Restaurant-Failure Myth*, BUS. WK., Apr. 16, 2007, http://www.businessweek.com/smallbiz/content/apr2007/sb20070416_296932.htm (reporting that 90% failure figure is myth and that 60% is more accurate).

¹¹² Pierre Azoulay and Scott Shane observe that territorial exclusivity provisions are common in franchising agreements and that they lead to a lower failure rate for new franchising systems. Pierre Azoulay & Scott Shane, *Entrepreneurs, Contracts, and the Failure of Young Firms*, 47 MGMT. SCI. 337, 355 (2001). Azoulay and Shane conclude that the failure to adopt such exclusive arrangements by some new franchisors is best explained by "their limited knowledge of contracting [which] leads them to overlook the importance of the franchisor encroachment problem when designing their contracts." *Id.* at 356; see also Arthur H. Travers, Jr., & Thomas D. Wright, Note, *Restricted Channels of Distribution Under the Sherman Act*, 75 HARV. L. REV. 795, 796 (1962) ("The three broad types of contractual arrangement by which manufacturers have traditionally sought to channel the activity of their distributing outlets are the exclusive franchise, the territorial restriction, and the customer restriction.").

willing to risk entry into the market, and also to invest more in entering, if, in the case of success, that first franchisee will be legally insulated to some extent from copycat competition.

III

INTEGRATING MARKET EXPERIMENTATION INTO INTELLECTUAL PROPERTY THEORY

Our analysis in Part II shows that intellectual property rights for market innovations can increase social welfare by counterbalancing first-mover disadvantages and thus encouraging market experimentation. Yet intellectual property doctrine and theory appear to pay little explicit attention to this concern. Market experimentation is not recognized as being a type of benefit that might justify the “embarrassment” of exclusive rights, even though intellectual property rhetoric tolerates such grants in other circumstances where there is some offsetting benefit, such as reduced consumer search costs or increased scientific innovation.¹¹³

Exclusive rights to protect market experimentation are, however, not without precedent. In Britain during its industrialization¹¹⁴ and in other countries,¹¹⁵ “patents of importation” gave exclusive rights to a party that first imported and commercialized products and processes from another country. Indeed, the patentee need not have had any claim to have been an independent creator of the technology. Many commentators have viewed patents of importation as being a mis-

¹¹³ Although Thomas Jefferson famously biased the issue by referring to “the embarrassment of an exclusive patent,” Letter from Thomas Jefferson to Isaac M’Pherson (Aug. 13, 1813), in 6 THE WRITINGS OF THOMAS JEFFERSON 175, 181 (H.A. Washington ed., Washington, D.C., Taylor & Maury 1854), commentators have frequently recognized that intellectual property protections can be justified if the benefits exceed the costs. See, e.g., J.A.K. Huntley & Frank H. Stephen, *Unfair Competition, Consumer Deception, and Brand Copying: An Economic Perspective*, 15 INT’L REV. L. & ECON. 443, 451 (1995) (finding trademark protection justified so “long as such expenditure is less than alternative consumer search-and-testing costs”); Steven R. Salbu, *AIDS and Drug Pricing: In Search of a Policy*, 71 WASH. U. L.Q. 691, 699–700 (1993) (arguing that patents are necessary for encouraging research and development).

¹¹⁴ The early British patent system began with the granting of letters patent by King Edward III to foreigners who wished to come to England to teach their trades to the English. Adam Mossoff, *Rethinking the Development of Patents: An Intellectual History, 1550–1800*, 52 HASTINGS L.J. 1255, 1259 (2001). In the sixteenth century, the Crown began to offer letters patent to English citizens as well for manufacturing monopolies in England. See *id.* at 1260–61. Though the Crown’s power to grant letters patent was circumscribed substantially in 1623 by the Statute of Monopolies, 1623, 21 Jac., c. 3, that statute continued to allow patents on any novel process or manufacture, and a process or other technology was considered “novel” if it was new to the country. Mossoff, *supra*, at 1271–73.

¹¹⁵ See Edward C. Walterscheid, *Charting a Novel Course: The Creation of the Patent Act of 1790*, 25 AIPLA Q.J. 445, 502 (1997) (referring to absence of “patents of importation” in United States as “radical . . . departure from the European patent custom”).

guided mercantilist policy because, unlike modern patents, these exclusive grants did not necessarily produce new technological information.¹¹⁶ Yet such an assessment overlooks that the goal of these patents was to encourage market experimentation, not technological experimentation.¹¹⁷ Though a variety of legal and technological changes made patents of importation infrequent after the late nineteenth century, they were not completely abandoned until 1977.¹¹⁸

¹¹⁶ See, e.g., EDWARD C. WALTERSCHEID, *THE NATURE OF THE INTELLECTUAL PROPERTY CLAUSE: A STUDY IN HISTORICAL PERSPECTIVE* 374–75 (2002) (arguing that discoveries or inventions that are non-novel—as those which are granted patents of importation inherently must be—fail to “promote the progress of useful arts”); MARGO A. BAGLEY, *Patently Unconstitutional: The Geographical Limitation on Prior Art in a Small World*, 87 MINN. L. REV. 679, 685, 696 (2003) (arguing that patent system constitutionally is obligated not to grant patents for old ideas and that patents of importation and even geographic restrictions on prior art considered in evaluating patents are unconstitutional); THOMAS B. NACHBAR, *Monopoly, Mercantilism, and the Politics of Regulation*, 91 VA. L. REV. 1313, 1338 (2005) (arguing that both patents of importation and exclusive trading charters were facets of mercantilist policy that are not consistent with modern U.S. legal norms); see also MARGO A. BAGLEY, *Still Patently Unconstitutional: A Reply to Professor Nard*, 88 MINN. L. REV. 239, 241–42 (2003) (restating argument that patents of importation are unconstitutional).

¹¹⁷ See WALTERSCHEID, *supra* note 116, at 314 (explaining that professed goal of patents of importation was minimization of risk involved in importation of European manufacturing technology to nascent United States). Alexander Hamilton similarly was drawn to the argument that “to the extent that importation benefits society to the same degree that invention does, it ought to be rewarded by exclusive rights in a similar manner.” EDWARD C. WALTERSCHEID, *Patents and Manufacturing in the Early Republic*, 80 J. PAT. & TRADEMARK OFF. SOC’Y 855, 865 (1998). Nonetheless, early American patent statutes were not seen, even by Hamilton, as authorizing patents of importation. *Id.* at 864. Indeed, the legislative history of early congressional debates reveals that a provision that would have authorized patents of importation was deleted. WALTERSCHEID, *supra* note 115, at 501–02, 502 n.206 (1997) (noting that United States was first country not to allow patents of importation).

¹¹⁸ WILLIAM ALDOUS ET AL., *TERRELL ON THE LAW OF PATENTS* § 3.05 (13th ed. 1982) (noting that in Britain, as of 1977 Patent Act, “a patent is no longer validly granted to the first importer of the invention into this country”); see also *id.* § 5.136 (noting that one “major difference[]” between United Kingdom’s 1949 and 1977 Patent Acts is that latter considers prior art published “worldwide” rather than prior art published only within Britain, thus making it so that no imported inventions could be novel); cf. GUY ALDOUS ET AL., *TERRELL ON THE LAW OF PATENTS* §§ 77–78 (11th ed. 1965) (stating that mere importer may obtain patent even though “in the popular sense he had invented nothing” (quoting *Plimpton v. Malcolmson*, (1876) 3 Ch.D. 531, 555 (U.K.))). Nevertheless, because of technical and legal developments, patents of importation had become much less common and important even by the end of the nineteenth century. Late in the nineteenth century, the British patent system began to require inventions to be technologically nonobvious, which limited the class of patentable invention to those having some technological significance. See JOHN F. DUFFY, *Inventing Invention: A Case Study of Legal Innovation*, 86 TEX. L. REV. 1, 53–58 (2007) (tracing the rise of British nonobviousness doctrine to judicial developments in 1889 and 1890). Increasing legal sophistication and better communications also meant that foreign developers of significant new technologies would know that, to preserve their rights, they should “import” their technologies into the U.K. by communicating the information to an English patent agent who would then seek patent rights for

The survival of the system for centuries provides a clear historical precedent for using exclusive rights to foster market experimentation.

Despite its apparent demise, the goal of generating market experimentation can nonetheless help justify various modern intellectual property doctrines. Perhaps as importantly, market experimentation can help unify seemingly discordant doctrines across many areas of intellectual property law, providing a justification relevant not only for copyright and patent protection but also for trademark and trade secret protection. These areas have fallen under the same umbrella of “intellectual property” solely because of the intangible nature of the property right, despite differences in the underlying theoretical justifications. The goal of fostering market experimentation is relevant to each area of intellectual property and, consequently, might help to bridge the gaps between them to form a more consistent theory of intellectual property protection.

In this Part, we aim to explain how existing intellectual property regimes may reinforce the pursuit of market experimentation and how that goal explains certain seemingly peculiar features of the law. Several caveats are in order. First, we do not claim that the pursuit of market experimentation is the only—or even the dominant—goal in each area of intellectual property. We contend merely that each of the regimes advances this purpose to some extent. Second, although the aim of market experimentation can help explain some intellectual property doctrines and trends, we do not claim to be offering a comprehensive positive theory of intellectual property law. Indeed, we suspect that there are many doctrines that seem inconsistent with the idea of encouraging market experimentation,¹¹⁹ and an aspiration of

the foreign inventor. Even early twentieth-century British patent treatises, in discussing patents of importation, devoted their main attention to the practice of patents being obtained by “[c]ommunicators of [f]oreign [i]nventions,” who were typically “agent[s] of the foreign inventor.” See 1 ROBERT FROST, TREATISE ON THE LAW AND PRACTICE RELATING TO LETTERS PATENT FOR INVENTIONS 22, 26 (4th ed. 1912). Under the Paris Convention and provisions of the U.K. Patent Act of 1907, foreign inventors were also given a right of priority if they had sought foreign patent rights and then sought U.K. patent rights within one year of their first foreign application. *Id.* at 24 Thus, long before 1977, reasonably vigilant foreign inventors could effectively eliminate the possibility of anyone else obtaining a U.K. patent of importation on their inventions.

¹¹⁹ For example, U.S. patent law has long eschewed any requirement that the patentee engage in any efforts, commercial or otherwise, to “work” the patented technology. See *Cont'l Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 429 (1908) (noting that since 1836, Congress has chosen not to impose any working requirement in U.S. patent law and holding that patentees may “use or not use” their inventions without losing their rights to enforce their patents); John M. Golden, Commentary, “Patent Trolls” and Patent Remedies, 85 TEX. L. REV. 2111, 2123 n.50 (2007) (noting that, in contrast to early British law, United States has avoided imposing “working” requirement on patents). This aspect of patent law cannot be justified by the goal of encouraging market experimentation.

our analysis is to urge that some such doctrines be reconsidered. Third, we do not even claim to be offering a comprehensive defense of doctrines that do advance the goal of market experimentation. For example, we will argue that although business method patents may encourage efficiency by promoting market experimentation, patent doctrine generally is not well tailored to encouraging market experimentation. Under existing patentability standards, business method patents could well do more harm than good.¹²⁰

We will proceed from areas in which the importance of experimentation is less obvious to those in which it might be more obvious, highlighting the relevance of market experimentation to areas of intellectual property law in which it might at first appear to be entirely irrelevant. Trademark and trade secret law generally have been seen as areas of intellectual property law with their own unique goals,¹²¹ but the market experimentation justification connects them both to each other and to patent and copyright law. In these two latter areas, the goal of encouraging experimentation (though not market experimentation) is perhaps more obvious, so our analysis will be less novel. But our analysis is most important in these areas, particularly in patent law, which has the greatest potential to serve as a regime that—at least in theory—could consciously promote goals of market experimentation.

A. Trademark

Trademark theory generally has been understood as aiming to economize on consumer search costs.¹²² While recognizing the centrality of consumer search to trademark law, we also believe that trademark law helps foster market experimentation. Trademarks (along with service marks and trade dress) are central to allowing an entrant into a new market to maintain its market share in the face of competition. If, for example, any competitor were permitted to use

¹²⁰ See *infra* Part III.D.

¹²¹ See, e.g., Mark A. Lemley, *The Modern Lanham Act and the Death of Common Sense*, 108 YALE L.J. 1687, 1695 (1999) (noting that trademark law's principal justification is to enable easier source identification, which is "different from [justifications] for other forms of intellectual property").

¹²² Once consumers associate a particular trademark with a particular source, preventing competitors from using that trademark allows consumers to purchase goods or services associated with the mark without having to engage in further investigation to confirm the quality of the source. See WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 167–68 (2003) (noting that branding conveys information about quality to consumers); see also Lemley, *supra* note 121, at 1690 (“[T]rademarks and advertising communicate useful information to consumers, and thereby reduce consumer search costs.”).

the label “Netflix” to describe services similar to Netflix’s, then Netflix likely would lose its market share much more rapidly,¹²³ because the Netflix product would seem less distinctive and attractive. The goal of encouraging market experiments like Netflix, however, provides an additional justification for trademark protection.

Our approach serves as an extension to a related, though less prominent, justification in trademark theory: Trademark helps protect producers’ investments. Producers can safely make additional investments in existing goods or services—perhaps using advertising to inform consumers of the benefits of product improvements—without worrying that consumers will be unable to identify the improved product.¹²⁴ Similarly, producers can extend trademarks to related product areas, allowing consumers to draw inferences about the quality of products that they have never consumed or heard about before.¹²⁵

A traditional criticism of this justification is that it may create deadweight costs by inducing overinvestment in advertising and marketing in order to create a “spurious image of high quality” and, consequently, it may allow trademark owners to charge higher prices relative to generic products.¹²⁶ In their classic analysis of the economics of trademark law, William Landes and Richard Posner note that prices for brand-named goods have “seemed to some economists and more lawyers an example of the power of brand advertising to bamboozle the public and thereby promote monopoly.”¹²⁷ Landes and Posner point out that the presence of differentiated prices between brand and generic products may not imply deadweight costs if the basis for the difference is that consumers are paying extra for guarantees of high-quality manufacturing or to avoid the expense of

¹²³ This effect might occur even if the law allowed the “true” or “original” Netflix to identify itself uniquely in some way so that consumers could distinguish, with minimal effort, the original from the copycat. For example, trademark law might be limited only to protecting the use of the word “original,” a word that occasionally has led to legal disputes. Cf. John Tierney, *In a Pizza War, It’s 3 Rays Against the Rest*, N.Y. TIMES, Mar. 25, 1991, at A1 (discussing dispute among many “original” Ray’s pizzerias).

¹²⁴ See William M. Landes & Richard A. Posner, *Trademark Law: An Economic Perspective*, 30 J.L. & ECON. 265, 269–70 (1987) (arguing that trademark protection encourages producers to invest in quality and consistency in order to reap benefits of reduced consumer search costs).

¹²⁵ See Frank I. Schechter, *The Rational Basis of Trademark Protection*, 40 HARV. L. REV. 813, 823 (1926) (arguing that owner of mark should be able to expand trade to other areas while using mark as “indicat[or] to the public [of] a constant and uniform source of satisfaction”).

¹²⁶ Landes & Posner, *supra* note 124, at 274.

¹²⁷ *Id.*

determining whether alternatives are in fact of equal quality.¹²⁸ The absence of empirical evidence showing that generic drugs have dramatically inferior quality as compared to brand drugs,¹²⁹ however, makes Landes and Posner's empirical claim difficult to verify.

Our justification provides a more satisfactory response to the argument that there are deadweight costs associated with trademark protection. Unlike the classic justification, our justification does not depend upon empirical evidence of the differences in quality between generic and brand products. Suppose that it could be shown that the application of trademark law in some identifiable set of cases reduced short-term consumer welfare because consumers irrationally overestimated the quality benefits of purchasing from the most familiar brand. Landes and Posner would then need to recommend relaxation of trademark rules, unless some second-order consideration (such as litigation costs) was sufficient to save the doctrine.¹³⁰ By contrast, we argue that trademarks serve a useful function even if many consumers, acting solely in their own private interests, are irrationally loyal to a brand. If there is some static inefficiency to consumers' preferences for brand names, market entrants will expect a greater market share and, therefore, engage in more market experimentation.¹³¹ This point is familiar to the literature on first-mover advantages,¹³² but that literature does not explain that this greater market share may itself be a

¹²⁸ See *id.* at 275 ("The fact that two goods have the same chemical formula does not make them of equal quality to even the most coolly rational consumer."). Landes and Posner also note that the concerns over deadweight costs actually have not influenced trademark doctrine, although they have influenced antitrust doctrine. *Id.* at 274–75.

¹²⁹ The Food and Drug Administration requires that, to be approved for use, a generic drug meet standards showing that it is equivalent to a brand-name drug that already has gone through the regulatory process. See 21 U.S.C. § 355(j) (2000 & Supp. IV 2006) (providing mandatory standards for generic drugs).

¹³⁰ Landes and Posner suggest that trademark law is justified because consumers are willing to pay more for a known brand in order to save search costs. See LANDES & POSNER, *supra* note 122, at 167–68 (describing savings in search costs as economic benefit of trademark law). Trademark law provides the needed legal protection to prevent free riding, thereby ensuring that consumers can rely on the brand name. *Id.* at 168. Landes and Posner do not discuss the possibility that consumers irrationally overestimate the value of trademarked goods. See *id.* at 167–68.

¹³¹ Theoretical economic models recognize, but sometimes may understate, the extent of brand-name preferences. For example, under one model, the first mover will have greater market share only proportional to the customer base that was established prior to the second mover's entry. See Jean Gabszewicz et al., *Sequential Entry with Brand Loyalty Caused by Consumer Learning-by-Using*, 40 J. INDUS. ECON. 397, 400–01 (1992) (arguing that in circumstances where consumer learning is not brand-specific, entry by first mover may expand second mover's available market). In many contexts, it is possible that new customers will prefer the established product even absent evidence of superior quality.

¹³² See, e.g., Lieberman & Montgomery, *supra* note 13, at 46 (noting that consumers' loyalty toward brands may help to create first-mover advantage).

social benefit by providing a dynamic incentive to engage in market experimentation.

Gideon Parchomovsky and Peter Siegelman contend, similarly to our argument, that trademark law can usefully “leverage” patent protection.¹³³ Brand loyalty among consumers allows producers to earn supercompetitive rents even after a patent expires, increasing the benefits of investments in research and development.¹³⁴ Meanwhile, trademark law imposes relatively little social welfare cost. To the contrary, producers have an incentive to increase output and to lower prices during the patent period in order to increase their market share during the trademark period.¹³⁵ Furthermore, there need not be deadweight costs in the trademark period, because those consumers who find the price of the previously patented good too high can opt, at some small search expense, for competitors’ lower-priced products, such as generic drugs. Parchomovsky and Siegelman thus question Supreme Court doctrines that seek to prevent patentees from trademarking functional characteristics in order to extend patent protection.¹³⁶

Our argument extends the logic of Parchomovsky and Siegelman beyond research and development to include garden-variety market experimentation and the commercialization of products that may not themselves be particularly technologically innovative or that may have long been known to those skilled in the art. Indeed, trademark’s

¹³³ Gideon Parchomovsky & Peter Siegelman, *Towards an Integrated Theory of Intellectual Property*, 88 VA. L. REV. 1455, 1458, 1473 (2002).

¹³⁴ Parchomovsky and Siegelman argue that allowing trademark protection to extend beyond patent life encourages companies to create brand loyalty and, therefore, to reduce monopolistic prices. *Id.* at 1473–74. If products were not trademark protected after patent life, any company could produce a copy and market the product under the same name. *Id.* Thus, without trademark protection, the first mover would have no incentive to price competitively while the product is patent protected. *Id.*

¹³⁵ *Id.* at 1473–81.

¹³⁶ *Id.* at 1464. The Supreme Court has stated repeatedly that a product’s functional features cannot be trademarked. *See, e.g.,* *Traffix Devices, Inc. v. Mktg. Displays, Inc.*, 532 U.S. 23, 29–30 (2001) (finding that prior patenting provides strong evidence of functionality, which precludes trademark protection); *Qualitex Co. v. Jacobson Prods. Co.*, 514 U.S. 159, 164 (1995) (noting that functionality doctrine prevents trademarks “from . . . inhibiting legitimate competition by allowing a producer to control a useful product feature”); *Inwood Labs., Inc. v. Ives Labs., Inc.*, 456 U.S. 844, 863 (1982) (White, J., concurring in result) (“A functional characteristic is ‘an important ingredient in the commercial success of the product,’ and, after expiration of a patent, it is no more the property of the originator than the product itself.” (quoting *Ives Labs., Inc. v. Darby Drug Co.*, 601 F.2d 631, 643 (2d Cir. 1979))). We do not necessarily agree with Parchomovsky and Siegelman’s criticism of the functionality doctrine because, if trademark law were to cover functional aspects of a product, then the trademark might create more significant deadweight loss by foreclosing the possibility that competitors could market equally viable alternative products.

capacity to leverage patent and other forms of intellectual property protection is a byproduct of its more general capacity to increase first-mover advantages and thus to generate greater incentives for market experimentation of all types, including but not limited to technological experimentation.¹³⁷ As Parchomovsky and Siegelman argue, this type of trademark protection (unlike the stronger intellectual property protection discussed later in this Article)¹³⁸ has only a small risk of causing deadweight loss.¹³⁹

Our analysis suggests that trademark law, perhaps entirely by accident, already helps to advance the goal of market experimentation. At least four seemingly odd features of trademark law are more justifiable in light of our theory. The first is the so-called initial interest line of cases, in which a firm uses a competitor's trademark to generate initial interest in the firm's own product.¹⁴⁰ Many courts have held such practices to be trademark infringement even in the absence of any evidence that consumers would do business with the firm under the mistaken belief that the firm was its competitor.¹⁴¹ Rather, the courts have justified finding trademark infringement on the theory that the use of the same or a similar trademark or name would allow the firm to gain "crucial credibility during the initial phases of a deal."¹⁴² Such holdings have been roundly criticized in the literature as being unjustifiable departures from the basic theory on which trademark law is conventionally based.¹⁴³ Our theory, how-

¹³⁷ Previous commentators have recognized some forms of market experimentation that trademark protection encourages, but they have not paid adequate attention to the risks associated with costly market entry. For example, Landes and Posner note that trademark protection creates incentives to invest in "new words or symbols or . . . design features." LANDES & POSNER, *supra* note 122, at 169 (footnote omitted).

¹³⁸ See *infra* Part III.C (discussing copyright); *infra* Part III.D (discussing patents).

¹³⁹ See *supra* notes 126, 131 and accompanying text (discussing deadweight loss).

¹⁴⁰ "The rationale for [the initial interest] rule is that the defendant should not be allowed even to get his foot in the door by means of deception. Once in, he may stay and thereby profit from his wrongdoing." 4 LOUIS ALTMAN & MALLA POLLACK, CALLMANN ON UNFAIR COMPETITION, TRADEMARKS AND MONOPOLIES § 22:11.50, at 19 (4th ed. Supp. 2007).

¹⁴¹ See, e.g., *Nissan Motor Co. v. Nissan Computer Corp.*, 378 F.3d 1002, 1007 (9th Cir. 2004) ("Initial interest confusion exists as a matter of law as to Nissan Computer's automobile-related use of 'nissan.com' because use of the mark for automobiles captures the attention of consumers interested in Nissan vehicles."); *Mobil Oil Corp. v. Pegasus Petroleum Corp.*, 818 F.2d 254, 259 (2d Cir. 1987) (noting that district court had found "a likelihood of confusion not in the fact that a third party would do business with Pegasus Petroleum believing it related to Mobil, but rather in the likelihood that Pegasus Petroleum would gain crucial credibility during the initial phases of a deal").

¹⁴² *Mobil*, 818 F.2d at 259.

¹⁴³ See, e.g., Robert N. Klieger, *Trademark Dilution: The Whittling Away of the Rational Basis for Trademark Protection*, 58 U. PITT. L. REV. 789, 795 (1997) (describing dilution law as "a radical and imprudent alternative to the consumer protection model of trade-

ever, rehabilitates such decisions. Indeed, under our view, a second mover's use of a first mover's trademark is socially *undesirable* precisely because the use of the mark *does* lower consumer search costs and thus increases the risk that a consumer will not choose the first mover's product.

Second, courts are generally reluctant to commit "genericide" by concluding that a trademark has become generic.¹⁴⁴ Everyday language suggests that "Q-Tips" and "Rollerblades" are used as generic terms by many consumers, and yet they persist as trademarks.¹⁴⁵ Scholars have long noted the law's reluctance to invalidate existing trademarks because they have become generic and have argued that this aspect of the law cannot be reconciled with trademark's goal of reducing consumer search costs.¹⁴⁶ We agree with that argument but nonetheless believe that courts should keep genericide rare because

mark rights"); Lemley, *supra* note 121, at 1704–05 (criticizing new trademark dilution doctrine as "being used to serve other purposes, ones that trademark theory does not support"). In criticizing the initial interest confusion doctrine, commentators have sometimes noted that an argument in favor of the doctrine is that it protects businesses' investments in goodwill. *See, e.g.*, Robert G. Bone, *Hunting Goodwill: A History of the Concept of Goodwill in Trademark Law*, 86 B.U. L. REV. 547, 613–14 (2006) (explaining argument of many courts that use of initial interest confusion in Internet-based trademark infringement cases does not fit with trademark law's functional goals but prevents infringers from free riding on others' goodwill). But commentators have not explained that the reason to protect goodwill is that such protection might encourage market experimentation, and they have generally found the "goodwill" argument to be wanting. *See, e.g.*, Jennifer E. Rothman, *Initial Interest Confusion: Standing at the Crossroads of Trademark Law*, 27 CARDOZO L. REV. 105, 162 (2005) (calling goodwill argument "[a] visceral reaction [that] flies in the face of basic free market principles which allow, and in fact demand, that competitors be able to benefit from value created by others").

¹⁴⁴ *See, e.g.*, *Coca-Cola Co. v. Overland, Inc.*, 692 F.2d 1250, 1254–55 (9th Cir. 1982) (holding that "Coke" is not generic); *In re America Online, Inc.*, 77 U.S.P.Q.2d (BNA) 1618, 1625 (T.T.A.B. 2006) (deciding that "INSTANT MESSENGER" is not generic). In general, the courts have interpreted the legal doctrine so as to keep genericide "a rare event." *See* Gerard N. Magliocca, *One and Inseparable: Dilution and Infringement in Trademark*, 85 MINN. L. REV. 949, 979 n.155 (2001) ("The doctrine revokes the rights of very few mark owners . . .").

¹⁴⁵ *See, e.g.*, *Q-Tips, Inc. v. Johnson & Johnson*, 206 F.2d 144, 146–47 (3d Cir. 1953) (holding that "Q-Tips" constitutes protectable trademark); Deborah R. Gerhardt, *The 2006 Trademark Dilution Revision Act Rolls Out a Luxury Claim and a Parody Exemption*, 8 N.C. J.L. & TECH. 205, 214 (2007) (citing "Rollerblade" as trademark that owner must protect diligently so it does not become generic).

¹⁴⁶ *See, e.g.*, Deven R. Desai & Sandra L. Rierson, *Confronting the Genericism Conundrum*, 28 CARDOZO L. REV. 1789, 1844 (2007) (arguing that law of genericism should focus on "whether the putative mark is functioning as a source identifier in the . . . marketplace" and that, if it is not, mark should be viewed as generic and unprotectable); Ralph H. Folsom & Larry L. Teply, *Trademarked Generic Words*, 89 YALE L.J. 1323, 1358–59 (1980) (noting that "[c]onsumers can face enhanced search costs and risks as a result of the claim of exclusive rights to generic words" and arguing that "legal tests of genericness . . . do not adequately take into account relevant economic considerations"); *see also* Lemley, *supra* note 121, at 1696 n.40 ("Creating circumlocutions to avoid [generic] trademarks is costly.").

the first-mover advantages provided by such trademarks encourage market entry for future potential products. Although any calculus involving search costs and stimuli to innovate will necessarily be imprecise, our analysis suggests, for example, that the phrase “Band-Aid” should remain trademarked. We suspect that many consumers purchase this brand of adhesive bandages simply because it is the only one that uses the phrase “Band-Aid.”¹⁴⁷ Price-conscious consumers, however, can still choose other brands, so we doubt this preference produces significant efficiency losses. Meanwhile, the profits that Johnson & Johnson continues to earn as a result of this consumer preference will encourage other innovation in the future.

Third, courts increasingly have been willing to extend trademark protections to trade dress and product configurations, while commentators have criticized this trend as extending trademark protections beyond the level needed to advance the traditional interest in permitting consumers to identify the source of goods.¹⁴⁸ Once again, we agree with other commentators that trademark law may well be exceeding its traditional justifications in this area, but we believe the change is salutary. The expanded law of trade dress protection allows a firm engaging in a market experiment to dress the innovative product in a design that is “inherently distinctive” (so that it will be assured of legal protection) and/or sufficiently memorable for the consumer to associate the product with the design.¹⁴⁹ If the market experimentation is successful, second movers will face a barrier to entering the market because they will have to convince consumers that a product with a quite different appearance is functionally the same as the known product. Trade dress protection can thus give the first mover some reward for the risk of the market experiment while also creating an incentive to curtail deadweight losses: The first

¹⁴⁷ See Folsom & Teply, *supra* note 146, at 1340–44 (noting that many consumers may use trademarked words such as “Plexiglass,” “Thermopane,” and “Formica” when they actually want any product from generic category, and that competitors to trademarked good may have difficult time competing because they first need to educate consumers that generic product is same as trademarked product).

¹⁴⁸ See, e.g., Lemley, *supra* note 121, at 1700–01 (noting expansion of law in this respect and arguing that, under recent court decisions, “the link between product configuration and consumer source identification has all but disappeared”); Glynn S. Lunney, Jr., *Trademark Monopolies*, 48 EMORY L.J. 367, 387 (1999) (asserting that trade dress cases, coupled with other recent developments, “have created an environment that welcomes claims based on little more than a defendant’s imitation of a successful product”).

¹⁴⁹ See *Two Pesos, Inc. v. Taco Cabana, Inc.*, 505 U.S. 763, 769–70 (1992) (holding that “inherently distinctive” trade dress is subject to protection under Lanham Act § 43(a), 15 U.S.C. § 1125(a) (2000), without any proof that trade dress has acquired “secondary meaning”—i.e., without proof that consumers uniquely associate trade dress with specific source).

mover will realize that if it tries to charge too much for the successful product, consumers may educate themselves about competing products.

Finally, our theory makes the cause of action of trademark dilution¹⁵⁰ seem less alien to trademark law. The most common dilution concern is that the use of a famous mark by a junior user¹⁵¹ for unrelated products—say, footballs branded as “Harley-Davidson” (or even just “Harley”)¹⁵²—may “blur” the famous mark, diminishing its branding power. The dilution action has been controversial,¹⁵³ perhaps because the concerns of dilution seem largely independent of the traditional trademark goal of minimizing consumer search costs.¹⁵⁴ The action, however, makes more sense from a market experimentation perspective. By protecting brand value built from market innovation, our theory provides a more solid justification for dilution protection. First, the higher anticipated value that dilution protection confers on successful brands increases the incentives to engage in market experiments.¹⁵⁵ If a manufacturer can figure out a combination of features that consumers greatly desire, it is rewarded with the additional protection conferred by trademark law. Moreover, the

¹⁵⁰ The dilution cause of action explicitly protects branding, barring activities that may dilute a trademark even in the absence of any evidence that such dilution will cause consumer confusion. Trademark Dilution Revision Act of 2006 § 2, 15 U.S.C.A. § 1125(c)(1) (West Supp. 2007); see also Julie Manning Magid et al., *Quantifying Brand Image: Empirical Evidence of Trademark Dilution*, 43 AM. BUS. L.J. 1, 5–6 (2006) (“This notion of protecting the inherent value of the trademark from dilution was singularly antithetical to the consumer confusion emphasis of trademark law.”).

¹⁵¹ A junior user is one who enters the market after the trademark holder. Consistent with our theory, dilution law does not apply to senior users, who enter the market before the user whose use makes the mark famous.

¹⁵² See *Ronda AG v. Harley-Davidson, Inc.*, No. 96-1297, 1997 WL 85809, at *1 (Fed. Cir. Feb. 27, 1997) (affirming cancellation of mark “Harley” for watches even though appellant Ronda had been using mark on its watches for several years).

¹⁵³ See, e.g., Lemley, *supra* note 121, at 1698, 1714 (describing dilution doctrine as “most obvious example of doctrinal creep in trademark law” and calling on courts to “impose[] significant limitations” on marks eligible for dilution protection); Kathleen B. McCabe, Note, *Dilution-by-Blurring: A Theory Caught in the Shadow of Trademark Infringement*, 68 FORDHAM L. REV. 1827, 1830 (2000) (discussing judicial skepticism toward dilution cause of action).

¹⁵⁴ See Lemley, *supra* note 121, at 1698 (“[B]ecause consumers need not be confused for dilution to occur, dilution laws represent a fundamental shift in the nature of trademark protection.”). For example, no one seems likely to purchase “Harley” footballs based on a belief that the brand necessarily identifies the source of the goods, and the existence of such footballs made by an entity other than the motorcycle manufacturer would not seem likely to make it more difficult for Harley-Davidson to convey to the public any improvement in its motorcycles.

¹⁵⁵ Cf. *Rolex Watch U.S.A., Inc. v. Canner*, 645 F. Supp. 484, 495 (S.D. Fla. 1986) (“Others who see the watches bearing the Rolex trademarks on so many wrists might find themselves discouraged from acquiring a genuine [Rolex] because the items have become too common place [sic] and no longer possess the prestige once associated with them.”).

mark holder may have an incentive to maintain a high reputation and reasonable prices. If consumers are not satisfied with the trademark owner's products or believe that the goods are overpriced, they may lose the positive assessment of the trademark owner necessary to generate sales of the relevant licensed goods. Second, the dilution cause of action preserves the mark holder's ability to use the mark on entirely new goods and services, increasing anticipated market share and thus the attractiveness of market entry. For example, Harley-Davidson could lend its name to a novel approach for a vacation resort (perhaps one that caters to the tastes of Harley motorcycle owners), with the trade name making it slightly harder for second movers to free ride in the event of success. These arguments suggest that perhaps courts should not be too stingy in determining that a mark is sufficiently famous to qualify for the dilution cause of action,¹⁵⁶ although we recognize that the limited number of attractive potential marks means that courts should not prevent use of a relatively unknown mark for unrelated products.

B. Trade Secret

One of the common justifications for trade secret law is that it serves a purpose similar to the patent system: Protection of secrets encourages firms to invest in the production of valuable secrets and thus in technical and scientific advances.¹⁵⁷ Yet this theory has some important difficulties. First, one of the main policies of the patent system is to ensure that nonobvious technical information *is* made public and *is not* kept as a trade secret.¹⁵⁸ A firm can pay a heavy price for maintaining nonobvious technological information as a trade secret—including the possibility that another firm may patent that information and enjoin the original creator's use.¹⁵⁹ Second, it seems

¹⁵⁶ For a discussion of the requirements necessary to prove that a mark is "famous," see Monica Hof Wallace, *Using the Past To Predict the Future: Refocusing the Analysis of a Federal Dilution Claim*, 73 U. CIN. L. REV. 945, 959–64 (2005).

¹⁵⁷ See Jonathan R. Chally, Note, *The Law of Trade Secrets: Toward a More Efficient Approach*, 57 VAND. L. REV. 1269, 1280 (2004) ("Trade secret law enhances exclusivity and thereby increases innovation by supplanting the precautions that an innovator must take to guard the secrecy of her information.").

¹⁵⁸ LANDES & POSNER, *supra* note 122, at 294–95; see also COMM. ON INTELLECTUAL PROP. RIGHTS IN THE KNOWLEDGE-BASED ECON., *supra* note 67, at 41 (arguing that patent system should, inter alia, "accommodate new technologies," reward only nonobvious, novel, or useful inventions, and disseminate technical information).

¹⁵⁹ See *Painton & Co. v. Bourns, Inc.*, 442 F.2d 216, 224 (2d Cir. 1971) (Friendly, J.) ("[A]nother who makes the invention may be able to secure a patent if he can establish that the earlier inventor suppressed or concealed it."). Other risks include the possibility that the secret may leak or that the inventor will forfeit his right to a patent if he does not apply within a year after the invention was "in public use or on sale." *Id.*; see also Uni-

puzzling that the law should seek to protect technical advances that are so minimal that they would not qualify for patent protection, presumably because they are obvious. A partial answer to this puzzle is that trade secret protection avoids the transaction costs associated with attempts to secure patents,¹⁶⁰ but this answer purports to reduce trade secret law to a kind of second-class intellectual property protection for relatively unimportant innovations.

Another justification for trade secret law is that the law is trying to minimize what otherwise would be significant social costs associated with self-help remedies.¹⁶¹ This justification may be correct, but it depends upon the answer to an empirical question: Would the social costs associated with self-help be greater than the social costs associated with trade secret law, such as litigation?¹⁶² Moreover, the law could limit self-help costs by affirmatively requiring information disclosure, for example, through a hypothetical Freedom of Information Act¹⁶³ that would apply to the private sector. As long as third parties were required to pay the transaction costs associated with information requests,¹⁶⁴ they would seek information only when the benefits to them were greater than the production costs. Reducing self-help may be a partial justification for trade secret doctrine, but it seems empirically questionable and incomplete.

A clue to improving our understanding of trade secret law lies in the recognition that it extends not only to technological information that may be difficult or costly to produce but also to nontechnological

versal Oil Prods. Co. v. Globe Oil & Ref. Co., 322 U.S. 471, 484 (1944) (stating that patents provide monopoly as reward for inventions but that “the quid pro quo is disclosure”).

¹⁶⁰ See Vincent Chiappetta, *Myth, Chameleon or Intellectual Property Olympian? A Normative Framework Supporting Trade Secret Law*, 8 GEO. MASON L. REV. 69, 139 (1999) (“Because trade secret law provides cost-efficient, dependable legal rights, it reduces the inventor’s incentive to pursue the patent alternative.”).

¹⁶¹ See Michael Risch, *Why Do We Have Trade Secrets?*, 11 MARO. INTELL. PROP. L. REV. 1, 27 (2007) (“[I]f information can be kept secret through self-help, then owners will spend more money to keep the information secret even in the absence of the law.”).

¹⁶² Courts do insist, as a prerequisite to trade secret protection, that the owners of a trade secret make some effort to keep it secret. See, e.g., *United States v. Lange*, 312 F.3d 263, 266 (7th Cir. 2002) (determining, in appeal of criminal conviction for dealing in trade secrets, whether owner of trade secret took reasonable measures to keep information secret); see also 18 U.S.C. § 1839(3)(A) (2000) (providing that, in order to have trade secret, owner must have “taken reasonable measures to keep such information secret”). But courts do not seek to determine whether self-help would be more efficient than trade secret protection in individual cases.

¹⁶³ 5 U.S.C. § 552 (2000).

¹⁶⁴ Such payments are required under the Freedom of Information Act. See *id.* § 552(a)(4)(A) (“[E]ach agency shall promulgate regulations . . . specifying the schedule of fees applicable to the processing of requests under this section . . .”).

information, like customer lists and sales figures.¹⁶⁵ This aspect of trade secret law is difficult to explain using the two justifications for trade secret law given above. The incentive-to-produce theory cannot justify protection for nontechnological data because that sort of information would be produced in the ordinary course of business even if intellectual property law did not provide any special incentive for its production. Meanwhile, given the existence of disclosure requirements for organizations such as public corporations,¹⁶⁶ affirmative disclosure regimes might appear to be viable alternatives to trade secrets, particularly for obtaining accounting information.

Justifying trade secret law as an appropriate social subsidy to encourage market experimentation makes for a more solid foundation. This view accounts for why trade secret law protects information such as customer lists and other data that would naturally be produced during the ordinary course of business. In our view, then, the goal of trade secret law is not to encourage the production of that information so much as the production of the business. Sometimes, of course, a business's success will be difficult to disguise, but even then there might be uncertainty about whether the business is so successful as to justify entry by a competitor. The law protects whatever business data can be hidden, thus discouraging subsequent entry, increasing a first entrant's expected share of rents, and creating stronger incentives for the market experiments that produce the data.¹⁶⁷ On our theory, trade secret law may be overinclusive—it protects copycat businesses too—but in general, innovators are the businesses that have the most information worth protecting.

C. Copyright

A market experimentation theory has also been invoked as part of the explanation for the existence of copyright. As then-Professor Stephen Breyer noted in 1970, copyright has historically been justified in terms of its incentives not only for authors but for publishers too.¹⁶⁸ Indeed, “[h]istorically the publisher led the fight for laws that allow

¹⁶⁵ See *Am. Family Mut. Ins. Co. v. Roth*, 485 F.3d 930, 933 (7th Cir. 2007) (holding that customer information was trade secret under Wisconsin's Uniform Trade Secrets Act, WIS. STAT. § 134.90(1)(c) (2005–06)).

¹⁶⁶ See Securities Act of 1933, 15 U.S.C. §§ 77a–77aa (2000) (requiring material disclosure of information about securities offered for public sale).

¹⁶⁷ See 18 U.S.C. § 1905 (2000 & Supp. V 2005) (imposing criminal penalties upon government employees who disclose trade secrets and other proprietary information gleaned during course of their employment).

¹⁶⁸ Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 HARV. L. REV. 281, 292 (1970).

him to obtain exclusive rights,”¹⁶⁹ and, in at least some markets, an important part of a publisher’s costs is the investment in publishing “books of unpredictable future popularity.”¹⁷⁰ Without copyright, publishers might not be willing to invest as much in books of unpredictable popularity—like “an author’s first novel”—because “competition will diminish the size of the best seller’s payoff” and thus make publication a less attractive “gamble.”¹⁷¹ As Landes and Posner recognize, a publisher cannot eliminate this risk by building a large and diversified portfolio of works because “even a diversified publisher will be at risk of losing his upside if his competitors are free to copy his successful works.”¹⁷²

A market experimentation theory can provide at least a partial explanation for some of the oddities of copyright law. For example, it is well known that copyright terms of protection have grown dramatically longer over the past two hundred years. Current terms of protection nearly equal or exceed a hundred years.¹⁷³ The additional years of protection recently added to the copyright term¹⁷⁴ seem poorly justified in terms of providing an incentive to the original author to create the work.¹⁷⁵ If such lengthy terms are justified—a matter on which there remains considerable debate¹⁷⁶—a market experimentation theory provides a better justification than an

¹⁶⁹ *Id.*

¹⁷⁰ *Id.* at 302.

¹⁷¹ *Id.* at 312; see also LANDES & POSNER, *supra* note 122, at 40–41 (noting that because “the author’s cost of creating the work, and many publishing costs . . . , are incurred before it is even known what the demand for the work will be,” copyist may avoid that risk by waiting “until he knows whether the work is a success” prior to investing in publication).

¹⁷² LANDES & POSNER, *supra* note 122, at 41.

¹⁷³ See 17 U.S.C. § 302 (2000) (“Copyright in a work created on or after January 1, 1978 . . . endures for a term consisting of the life of the author and 70 years after the author’s death.”).

¹⁷⁴ Sonny Bono Copyright Term Extension Act § 102(b), 17 U.S.C. § 302 (2000).

¹⁷⁵ See Brief of George A. Akerlof et al. as Amici Curiae in Support of Petitioners at 5–7, *Eldred v. Ashcroft*, 537 U.S. 186 (2003) (No. 01-618) (arguing that present value of payments decreases over time, making longer copyright term very small extra incentive for new works).

¹⁷⁶ Commentators have argued that the current copyright term is too long. See, e.g., Avishalom Tor & Dotan Oliar, *Incentives to Create Under a “Lifetime-Plus-Years” Copyright Duration: Lessons from a Behavioral Economic Analysis for Eldred v. Ashcroft*, 36 LOY. L.A. L. REV. 437, 439–40 (2002) (arguing that although life-plus-years term of Copyright Term Extension Act provides strong incentives to produce copyrighted works, extension-of-years portion of duration does not increase those incentives); see also Marci A. Hamilton, *Copyright Duration Extension and the Dark Heart of Copyright*, 14 CARDOZO ARTS & ENT. L.J. 655, 657 (1996) (suggesting that not enough empirical research has been conducted to base justification for copyright term extensions on incentives to create). For a defense of the long copyright term, at least for derivative works, see Michael Abramowicz, *A Theory of Copyright’s Derivative Right and Related Doctrines*, 90 MINN. L. REV. 317, 371 (2005).

incentive-to-create theory. The decision to run an additional printing of an old book or a new release of an old film, accompanied with a sufficient marketing campaign to inform consumers, may be a highly risky business venture. It is, in effect, a test of the current market for the book or film. In the absence of copyright protection, the risk is borne entirely by the first mover. If the work is not protected by copyright and the market proves favorable, second movers and consumers will reap a significant portion of the benefits. Yet, if the risk borne by the first mover is too great and the portion of the benefits realized too little, the market test will never occur.¹⁷⁷ Consumers may be better off permitting the first mover to reap more benefits so that there are more market tests, and thereby a greater diversity of works available, including old works.

As we have stressed, however, the market experimentation theory does not necessarily lead to more and more expansive theories of intellectual property. Lengthening copyright terms may be a sensible response where no one would have an incentive to republish the work in the absence of a property right. It is much more difficult to justify lengthening copyrights on wildly popular works, like Mickey Mouse films, because little market uncertainty currently exists with respect to such works. Long copyright terms are thus a somewhat crude mechanism for encouraging market experiments on works that have failed to attract public attention. In this case, recognizing the market experimentation concerns would likely lead to a more circumscribed right to lengthy copyrights.

Similarly, in the areas of derivative rights, market experimentation may help to explain not the extent but rather the *allocation* of rights. Under current copyright law, the creator of a first work has broad rights to derivative works based on the initial work.¹⁷⁸ The

¹⁷⁷ Landes and Posner make a similar point in justifying a system of indefinitely renewable copyrights. See William M. Landes & Richard A. Posner, *Indefinitely Renewable Copyright*, 70 U. CHI. L. REV. 471, 488–89 (2003) (considering incentives to resurrect works of forgotten novelist whose works have fallen into public domain). They do not, however, acknowledge that the point furnishes a broader argument for intellectual property protection of market experimentation, nor do they note that their point may apply even to new editions or releases of readily remembered works.

¹⁷⁸ See, e.g., 17 U.S.C. § 101 (2000) (“A ‘derivative work’ is a work based upon one or more preexisting works, such as a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which a work may be recast, transformed, or adapted.”); Pamela Samuelson, *Creating a New Kind of Intellectual Property: Applying the Lessons of the Chip Law to Computer Programs*, 70 MINN. L. REV. 471, 521 & n.36 (1985) (noting that language of § 101 of Copyright Act defines derivative works “very broadly”); see also Jed Rubenfeld, *The Freedom of Imagination: Copyright’s Constitutionality*, 112 YALE L.J. 1, 55 (2002) (arguing for different intellectual property regime with greatly reduced protection for derivative rights).

rules of derivative works involve not a broadening of copyrights but a reallocation of rights from the creator of the derivative work to the creator of the original work. Under an incentive-to-create theory, broad derivative rights present a conundrum: A broader right granted to the copyright of the initial work might increase the incentives to create that initial work, but it also reduces the incentives for others to create derivative works. The counterbalancing effect might lead to the creation of fewer works, and the incentive-to-create theory cannot easily justify the law's preference for the creator of the initial work over the creator of the derivative work.

Market experimentation, however, does justify the preference. An initial work will almost certainly face more risk than a derivative work, if for no other reason than that creators of derivative works will avoid making derivatives of flops. No one invests in sequels to *Ishtar*, *Heaven's Gate*, or *The Adventures of Pluto Nash*,¹⁷⁹ but it was fairly easy to predict that either *Shrek* sequel¹⁸⁰ would have better chances of success than the average movie.¹⁸¹ The right to the derivative work is thus allocated to the work that bears the higher level of market risk. This increases the incentives to bear the greater risks in creating truly innovative characters or plots,¹⁸² even though it may decrease the number of derivative works that are produced from works that turn out to be successful.

Finally, market experimentation may suggest that copyrights should be narrowed in some fields where the costs of distribution, and thus the costs of market experiments, have fallen dramatically. Internet distribution of music and writings is an obvious example of

¹⁷⁹ According to Wikipedia, *Ishtar*, *Heaven's Gate*, and *The Adventures of Pluto Nash* are three of the least successful films ever. See *List of U.S. Box Office Bombs*, in WIKIPEDIA, http://en.wikipedia.org/wiki/List_of_US_box_office_bombs (last visited Jan. 18, 2008). The failure of *Heaven's Gate* is credited with bankrupting the prominent studio United Artists. See Anita Gates, *Final Cut: The Making and Unmaking of "Heaven's Gate,"* N.Y. TIMES, Oct. 8, 2004, at E1 (noting that film "destroyed United Artists financially"). *Ishtar* was a "fabled disaster[]" despite a cast including stars Dustin Hoffman and Warren Beatty. Caryn James, *The Fireworks of Elaine May*, N.Y. TIMES, Feb. 24, 2006, at E1. *Pluto Nash* is said to hold the current record as the biggest box office loser ever, with a net loss of \$95 million. *The Adventures of Pluto Nash*, <http://www.imdb.com/title/tt0180052/> (last visited Jan. 18, 2008).

¹⁸⁰ SHREK 2 (DreamWorks 2004); SHREK THE THIRD (DreamWorks 2007).

¹⁸¹ *Shrek 2* grossed \$441 million; *Shrek the Third*, \$323 million. *Shrek 2*, <http://www.boxofficemojo.com/movies/?id=shrek2.htm> (last visited Mar. 6, 2008); *Shrek the Third*, <http://www.boxofficemojo.com/movies/?id=shrek3.htm> (last visited Mar. 6, 2008).

¹⁸² See, e.g., 2 PAUL GOLDSTEIN, COPYRIGHT § 5.3 (2005) (explaining that there will be greater incentives to promote novel if no one else will be able to copy its expressive content).

new technologies dramatically decreasing distribution costs.¹⁸³ Though we are not convinced that some degree of copyright protection cannot be justified on the basis of the incentive-to-create theory, or that the reduction in distribution costs has eliminated the riskiness of underwriting new music—since perhaps the real cost lies in the advertising campaign that educates potential consumers as to the value of the work—we nonetheless must agree that reductions in distribution costs reduce the costs of market experiments and therefore raise the question of whether copyright needs contraction.

Ultimately, however, copyright law is probably the area of intellectual property that is least relevant to our thesis. The problem is that copyright is simply too narrow to encourage much experimentation. If someone has an idea for a new type of book that turns out to be successful, then others can write similar books and compete with the original. The markets for readers, listeners, and viewers are like any other markets, and there will generally be insufficient incentives for writers, musicians, and movie studios to undertake risky experiments whose primary value would come from encouraging new work from competitors. Even worse, someone who undertakes the expensive experiment of compiling a large but unoriginal data set cannot rely on copyright to protect even that compilation,¹⁸⁴ let alone the idea of attempting to compile similar sets. Though there may well be sound reasons for these limitations, many aspects of copyright law thus do not seem finely tuned to encouraging market experimentation.

D. Patents

In the modern era, the standard justification for patents has been that they are necessary to encourage the production of useful technological information.¹⁸⁵ This justification accounts for many of patent law's major features, including (1) the requirement that the patentee

¹⁸³ See Raymond Shih Ray Ku, *The Creative Destruction of Copyright: Napster and the New Economics of Digital Technology*, 69 U. CHI. L. REV. 263, 294–97 (2002) (arguing that recent dramatic decrease in costs of distributing songs partly undermines justification for copyright in that field); see also Breyer, *supra* note 168, at 299 (accurately predicting that computers will lower costs of initial publishing by “eliminating the cost of retyping copy on, for example, a linotype machine” and “lower[ing] inventory costs by making possible the printing of books ‘on demand,’” and arguing that such possible developments may weaken justification for copyright).

¹⁸⁴ See *Feist Publ'ns., Inc. v. Rural Tel. Serv.*, 499 U.S. 340, 362–64 (1991) (holding that unoriginal arrangement of factual data, in this case alphabetical listing of names and telephone numbers in telephone book, is not protected by copyright).

¹⁸⁵ See, e.g., *Aronson v. Quick Point Pencil Co.*, 440 U.S. 257, 262 (1979) (“First, patent law seeks to foster and reward invention . . .” (citing *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480–81 (1974))); see also Dan L. Burk & Mark A. Lemley, *Policy Levers in*

provide a complete and enabling disclosure of the patented subject matter,¹⁸⁶ (2) the prohibition against patenting non-novel or obvious subject matter (with novelty and nonobviousness defined on the basis of all or nearly all information that is publicly available anywhere in the world),¹⁸⁷ and (3) the general absence of any requirement that the patentee actually commercialize the patented subject matter.¹⁸⁸ Nevertheless, a market experimentation theory provides an explanation for certain patent practices. We outline four such doctrines below. For the first two, we are somewhat critical and show how these practices can lead to inefficient results unless other modifications of patent doctrine are also made. For the second pair, we view the doctrines more favorably but suggest some modifications.

Two features of modern U.S. patent law—the recognition of business method patents¹⁸⁹ and the weakening of the traditional nonobviousness standard¹⁹⁰—are quite plainly linked to a theory of market experimentation. We can make this assertion with confidence because both developments were pioneered and encouraged by Judge Giles Rich, who expressly endorsed the view that patent law should be designed to provide “[an] inducement to risk an attempt to commercialize the invention.”¹⁹¹ That “‘business’ aspect of the matter,” Rich argued, “is responsible for the actual delivery of the invention into the hands of the public.”¹⁹² Although Rich did not consider the possi-

Patent Law, 89 VA. L. REV. 1575, 1576 (2003) (arguing that modern applications of patent law promote innovation nonuniformly between different high-technology industries).

¹⁸⁶ Patent Act of 1952 § 112, 35 U.S.C. § 112 (2000); *see also* J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 142 (2001) (“The disclosure required by the Patent Act is ‘the *quid pro quo* of the right to exclude.’” (quoting *Kewanee*, 416 U.S. at 484)).

¹⁸⁷ *See* 35 U.S.C. § 102 (2000) (novelty); *id.* § 103 (nonobviousness).

¹⁸⁸ *See id.* § 271(d)(4) (stating that patent holder cannot be denied enforcement for “refus[ing] to license or use any rights to the patent”); *Cont'l Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 429 (1908) (holding that patent is not unenforceable merely because patentee neglected to put it to commercial use).

¹⁸⁹ *See* *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1375 (Fed. Cir. 1998) (clarifying that business methods are subject to same patentability requirements as other processes or methods).

¹⁹⁰ *See, e.g.*, Glynn S. Lunney, Jr., *E-obviousness*, 7 MICH. TELECOMM. & TECH. L. REV. 363, 373–74 (2001) (asserting that, before creation of Federal Circuit, patents were invalidated on basis of obviousness in two-thirds or more of cases where patent was found invalid, but that proportion dropped to as low as one-fifth following creation of Federal Circuit, suggesting that “obviousness is much less central in appellate determinations of patent validity under the Federal Circuit”). *But see* *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739 (2007) (rejecting Federal Circuit’s approach to determining whether patent is obvious).

¹⁹¹ Giles S. Rich, *The Relation Between Patent Practices and the Anti-monopoly Laws, Part II*, 24 J. PAT. OFF. SOC'Y 159, 177 (1942).

¹⁹² *Id.*

bility of providing exclusive rights where there was no invention of any kind, he believed that the public benefits of commercialization provided a core justification for the patent system.

Over a half century after Rich, then a lawyer, wrote those words, business method patents became recognized by U.S. courts in *State Street Bank & Trust v. Signature Financial Group, Inc.*,¹⁹³ an opinion authored by Judge Rich. In some circumstances, business method patents can be justified without resort to a theory of encouraging commercialization or market experimentation. For example, the creation of an innovative technique in business, such as the Black-Scholes method for pricing options,¹⁹⁴ might be viewed as highly similar to the production of new technological information in a field of engineering, broadly conceived. But this category of business innovations may not exhaust the class of business methods patents that have been issued. In 2005, for example, the Board of Appeals of the U.S. Patent and Trademark Office (PTO) held that a business method patent need not make any “technological” contribution to the art.¹⁹⁵ Such nontechnological business patents might be justified on the grounds that they encourage the development and market testing of “economically non-obvious” business methods.¹⁹⁶

Another major development of U.S. patent law starting in the late twentieth century was the weakening of the traditional nonobvi-

¹⁹³ 149 F.3d 1368.

¹⁹⁴ See Fischer Black & Myron Scholes, *The Pricing of Options and Corporate Liabilities*, 81 J. POL. ECON. 637 (1973) (proposing theoretical valuation formula for options); see also F. Russell Denton & Paul J. Heald, *Random Walks, Non-cooperative Games, and the Complex Mathematics of Patent Pricing*, 55 RUTGERS L. REV. 1175, 1176 n.6 (2003) (describing history and utility of Black-Scholes formula).

¹⁹⁵ *Ex parte Lundgren*, 76 U.S.P.Q.2d (BNA) 1385, 1387–88 (B.P.A.I. 2005). We note that the Board of Patent Appeals and Interferences has recently changed course on this issue. See *Ex parte Bilski*, Appeal No. 2002-2257, slip op. at 57–58 (B.P.A.I. heard Mar. 8, 2006), available at <http://www.uspto.gov/web/offices/dcom/bpai/its/fd022257.pdf> (asserting that *Lundgren* was not “stated or intended” to “eliminat[e] a ‘technology’ requirement for patents”). The Federal Circuit also seems to be trying to cut back on *State Street* and to curtail the availability of business method patents. See *supra* notes 18, 20. Our point in the text is merely that, for some period of time, the U.S. PTO was willing to issue business method patents without necessarily demanding that the patents disclosed nonobvious technical information (broadly construed). The Federal Circuit’s apparent willingness to cut back on all method patents—including those that offer nonobvious insights into complex arts such as finance, arbitration, and risk management—raises other issues that are beyond the scope of this Article.

¹⁹⁶ By “economically nonobvious” business methods, we mean methods of doing business that can be launched without any new information but that have uncertain prospects as to whether they could possibly succeed. For example, in 1998, no one would have needed any additional information to create a business like Netflix; the reason it was not created was because its chances of market success were so uncertain.

ousness standard.¹⁹⁷ The traditional view of nonobviousness requires the patent specification to have revealed some significant new technological information.¹⁹⁸ Between 1982 and 2006, the Court of Appeals for the Federal Circuit dramatically weakened this standard of nonobviousness by requiring proof of a teaching, suggestion, or motivation in the prior art before any permutation of old technology could be considered obvious.¹⁹⁹ In taking this step, the Federal Circuit was led by Judge Rich.²⁰⁰ Such a watering down of the nonobviousness standard is difficult to justify if the sole goal of patent law is to encourage the production of new technological information. If, on the other hand, the patent system is designed to encourage the commercialization of new (but not necessarily technologically innovative) products, then the weakening of the nonobviousness standard is at least understandable. Indeed, a logical extension of the theory would permit patents to issue on products that were technologically non-novel, provided that they did not already exist in the marketplace.

In recognizing that these first two developments in U.S. patent law could be justified on the grounds of encouraging market experimentation, we do not mean to suggest that promoting market experimentation is more important than promoting technological experimentation. Nor do we believe that business method patents and the watering down of the nonobviousness standard are necessarily positive developments. To the contrary, we believe these develop-

¹⁹⁷ See, e.g., Lunney, *supra* note 190, at 370–94 (discussing vitiation of nonobviousness requirement in Federal Circuit).

¹⁹⁸ See *Graham v. John Deere Co.*, 383 U.S. 1, 11–18 (1966) (holding that Patent Act of 1952 embraces objective doctrine of *Hotchkiss v. Greenwood*, 52 U.S. (11 How.) 248 (1850), for establishing nonobviousness, which requires that, in comparison with previous art, patent must evince some innovation beyond foresight of person having ordinary skill in pertinent art).

¹⁹⁹ See, e.g., *Pro-Mold & Tool Co. v. Great Lakes Plastics*, 75 F.3d 1568, 1573 (Fed. Cir. 1996) (applying this test); *In re Sernaker*, 702 F.2d 989, 995–96 (Fed. Cir. 1983) (same). Scholarly commentary roundly criticized this teaching-suggestion-motivation test as too lax on patent invalidation. See, e.g., Lunney, *supra* note 190, at 379 (describing “suggestion test” as contributing to vitiation of nonobviousness requirement). The Supreme Court ultimately held that this test of obviousness was too constrained. *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007) (“The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents.”); see also John F. Duffy, Commentary, *KSR v. Teleflex: Predictable Reform of Patent Substance and Procedure in the Judiciary*, 106 MICH. L. REV. FIRST IMPRESSIONS 34 (2007), <http://www.michiganlawreview.org/firstimpressions/vol106/duffy.pdf> (discussing author’s involvement in *KSR* litigation and describing importance of *KSR* in reforming patent doctrine).

²⁰⁰ See generally George M. Sirilla, *35 U.S.C. § 103: From Hotchkiss to Hand to Rich, the Obvious Patent Law Hall-of-Famers*, 32 J. MARSHALL L. REV. 437, 509–58 (1999) (discussing Judge Rich’s deep contributions to evolution and application of nonobviousness doctrine in U.S. courts).

ments could lead to dramatically inefficient results unless other aspects of patent law are also modified. Most importantly, current U.S. patent law does not require a patentee to bring the invention to market,²⁰¹ does not try to evaluate economic nonobviousness, and does not consider post-patenting commercialization exclusively by individuals other than the patentee to be a reason to invalidate an issued patent.²⁰² In combination, these features of patent law provide an opportunity for patentees to free ride on the efforts of the true first movers in a field.²⁰³

A good example is provided by the recent BlackBerry-related litigation.²⁰⁴ The patentee in that case held broad patents on the technological capability of sending email via a wireless network to a wireless device.²⁰⁵ Technologically, these patents were highly suspect and most likely obvious.²⁰⁶ It is nonetheless possible to believe that the development and commercialization of a wireless e-mail product entailed enormous market risks, though those risks were economic and nontechnological. But if so, those risks were borne by Research in Motion (RIM), the first mover that developed and commercialized the BlackBerry.²⁰⁷ The patent system produced what is, in our view, a

²⁰¹ See *supra* note 188.

²⁰² See *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 393–94 (2006) (holding that MercExchange's lack of commercial activity did not preclude its right to injunction after finding of willful infringement). Further, the Federal Circuit did not consider the lack of commercial use when considering validity of the patents in question in *NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1157 (2006), in which NTP was the patent-holding company; in *MercExchange, L.L.C. v. eBay, Inc.*, 401 F.3d 1323 (Fed. Cir. 2005), *vacated*, 547 U.S. 388 (2006), in which MercExchange no longer used patented technology; and in *Eolas Technologies Inc. v. Microsoft Corp.*, 399 F.3d 1325 (Fed. Cir. 2005), in which Eolas was not commercializing patented technology.

²⁰³ See, e.g., Sean M. O'Connor, *Using Stock and Stock Options to Minimize Patent Royalty Payment Risks After Medimmune v. Genentech*, 3 N.Y.U. J.L. & Bus. 381, 386 (2007) (describing operation of "patent trolls," who do not commercialize their patents and instead wait until another party infringes them).

²⁰⁴ *NTP*, 418 F.3d 1282; see also Ian Austen, *BlackBerry Service to Continue*, N.Y. TIMES, Mar. 4, 2006, at C1 (providing brief history of litigation, which culminated in settlement award to NTP of \$612.5 million).

²⁰⁵ For a description of NTP's patents-in-suit, which contemplate the receipt of electronic mail by a portable wireless receiver, see *NTP*, 418 F.3d at 1288–90. No particular wireless network (beyond the source and receiver) is contemplated in NTP's patents, nor do the patents detail a method for sending messages from the receiver. *Id.* The court compared this to Research in Motion's more particularized system, which incorporates server-end software, nationwide mobile wireless networks, and a method for sending messages from the RF receiver. *Id.*

²⁰⁶ The PTO decided to reconsider the validity of NTP's patents while the litigation was pending. Teresa Riordan, *The Battle over Blackberry Heads to a Crucial Court Date, and a Challenge of More Patents*, N.Y. TIMES, Feb. 17, 2003, at C2.

²⁰⁷ See Sofy Carayannopoulos, *Research in Motion: A Small Firm Commercializing a New Technology*, 29 ENTREPRENEURSHIP THEORY & PRAC. 219, 219–25 (2005) (providing

startlingly backwards result: RIM was forced to pay more than a half billion dollars²⁰⁸ to a patentee who had contributed little or nothing to technological advances and had risked nothing in the commercialization of the technology.²⁰⁹ Rather than rewarding the first mover, the patent system imposed an unjustified tax upon the company.²¹⁰

Two other patent law doctrines show that considerations of market experimentation can be deployed more subtly to adjust rights. In *eBay, Inc. v. MercExchange, L.L.C.*, the Supreme Court ruled that a district court must use the “traditional [equitable test] that governs the award of injunctive relief” in determining whether to issue injunctions in patent cases.²¹¹ In an influential concurring opinion, Justice Kennedy stressed that in deciding to withhold injunctive relief, a court should consider whether the patentee is “us[ing] patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees.”²¹² That view, which lower courts seem to be following,²¹³ is consistent with a market experimentation theory. On the margins, the law should favor firms risking market entry over firms avoiding such a risk. Those who invest in bringing a technology to market should be entitled to slightly more generous remedies if they are patentees and slightly greater accommodation if they are defendants in infringement actions. Here, a market experimentation theory

history of RIM and notes on development, production, and marketing of BlackBerry system).

²⁰⁸ See Austen, *supra* note 204 (reporting that RIM settled infringement suit for \$612.5 million).

²⁰⁹ See Mike Hughlett, *Blurry on Blackberry*, CHI. TRIB., Feb. 19, 2006, § 5, at 1 (explaining that Thomas Campana Jr., inventor of patents-at-suit, founded NTP merely in order to “work out licensing agreements for [his] patents”).

²¹⁰ Before the settlement, the PTO indicated that, upon review, it would likely find several, if not all, of NTP’s patents to be invalid. See Ian Austen, *U.S. Patent Office Likely To Back BlackBerry Maker*, N.Y. TIMES, Dec. 20, 2005, at C5 (reporting that PTO notified companies that it expected to reject several NTP patents). Indeed, the PTO found two of the nine disputed patents to be invalid before RIM ultimately settled with NTP. See Bloomberg News, *Ruling for Maker of BlackBerry*, N.Y. TIMES, Dec. 2, 2005, at C2 (reporting nonfinal ruling by PTO that one of NTP’s patents was invalid); Bloomberg News, *Ruling May Help BlackBerry Maker*, N.Y. TIMES, Feb. 23, 2006, at C18 (reporting two final actions by PTO that found two NTP patents invalid). Yet RIM remained under tremendous practical pressure to settle the litigation because it faced the strong likelihood that the district court would issue an injunction shutting down its service prior to the government’s final resolution of the patent reexamination proceedings. See *NTP, Inc. v. Research in Motion, Ltd.*, 397 F. Supp. 2d 785, 786–89 (E.D. Va. 2005) (noting that District Court and Federal Circuit had denied three previous attempts by RIM to stay proceedings during reexamination of NTP’s patents and denying fourth such attempt).

²¹¹ 547 U.S. 388, 394 (2006).

²¹² *Id.* at 396 (Kennedy, J., concurring).

²¹³ See, e.g., *MercExchange, L.L.C. v. eBay, Inc.*, 500 F. Supp. 2d 556, 582 (E.D. Va. 2007) (quoting Justice Kennedy’s concurring opinion, 547 U.S. at 396, in course of denying *MercExchange*’s request for injunction).

justifies both a slight expansion and a slight contraction of baseline rights.

Similarly, U.S. patent law has frequently looked to commercialization efforts in deciding the scope and validity of patents. Under the “paper patent” doctrine, U.S. courts have in the past distinguished between patents that remain merely pieces of paper issued by a government agency and those that are made into commercial products.²¹⁴ In a variety of circumstances, the paper patent doctrine either extended or limited patent rights depending upon the degree of commercialization. In deciding questions of infringement, courts frequently held that a paper patent was to be given a narrower interpretation than a commercialized patent.²¹⁵ Also, in determining a patent’s validity, courts tended to discount prior art that was merely a paper patent, thus allowing patentees to patent subject matter that was closer to uncommercialized prior art than would have been permitted if the prior art had been commercialized.²¹⁶ Finally, courts counted successful commercialization of an invention in favor of sustaining the validity of the patent.²¹⁷ Though the paper patent doctrine has fallen out of favor²¹⁸—perhaps because it is hard to rec-

²¹⁴ See, e.g., *Am. Cyanamid Co. v. Hercules Inc.*, 260 F. Supp. 368, 377 & n.32 (D. Del. 1966) (citing cases supporting paper patent doctrine); see also *In re Holladay*, 584 F.2d 384, 386–87 (C.C.P.A. 1978) (holding that in choosing prior art to compare with claimed invention, applicant should be permitted to select commercialized patent over paper patent that is equally close to claimed invention).

²¹⁵ See, e.g., *Wire Tie Mach. Co. v. Pac. Box Corp.*, 102 F.2d 543, 556 (9th Cir. 1939) (holding patent on innovation never “utilized or placed upon the market” to be “a paper patent” that would not be given “any broader scope than it is clearly required to be given”).

²¹⁶ See, e.g., *Power Curbers, Inc. v. E.D. Etnyre & Co.*, 298 F.2d 484, 493 (4th Cir. 1962) (rejecting argument that successful patent should be viewed as obvious variation of “a number of old paper patents” and reasoning that “patents for useful inventions ought not be invalidated and held for naught because of such excursions into the boneyard of failures and abandoned experiments” (quoting *Reynolds v. Whitin Mach. Works*, 167 F.2d 78, 84 (4th Cir. 1948))).

²¹⁷ See *Goodyear Tire & Rubber Co. v. Ray-O-Vac Co.*, 321 U.S. 275, 278–79 (1944) (counting patentee’s commercial success in favor of sustaining patent where patentee was first to market product and product was “met with immediate commercial success”); *Todd v. Sears, Roebuck & Co.*, 216 F.2d 594, 596 (4th Cir. 1954) (invalidating patent determined to be “mere paper patent which has never been put into production”); *Schweyer Elec. & Mfg. Co. v. Reading Co.*, 63 F.2d 402, 405 (3d Cir. 1933) (viewing patent on device not “successful enough to warrant the risk of installation and use” to be “theoretical or paper patent” and invalidating it for want of invention); *Air Reduction Co. v. Carbo-Oxygen Co.*, 17 F.2d 138, 142 (D. Del. 1926) (holding patent invalid based in part on finding that “the patent is purely a paper patent” that “has made no imprint upon the art”), *aff’d*, 19 F.2d 1014, 1015 (3d Cir. 1927) (expressly adopting district court’s reasoning on paper patent issue).

²¹⁸ See, e.g., *Frank B. Killian & Co. v. Allied Latex Corp.*, 188 F.2d 940, 942 (2d Cir. 1951) (Hand, C.J.) (“The phrase ‘paper patent’ is a mere bit of rhetoric, usually employed as a makeweight by judges who wish to support the patent in suit, but are embarrassed by a

oncile with the dominant view that the patent system encourages the production and disclosure of technical information—our analysis suggests that the paper patent doctrine may have served a useful economic function in encouraging and protecting market experiments. A revitalization of the doctrine may be in order.

In fact, one aspect of the paper patent doctrine survives in modern validity analysis. Although U.S. patent law has no clear doctrine permitting the nonobvious feature of the invention to be related solely to commercialization (as opposed to technical achievement),²¹⁹ it does allow for commercial success to be considered as a factor in the nonobviousness analysis.²²⁰ Thus, if the commercializer can make even a relatively modest change to previously known subject matter, the modified invention may be patentable if it is commercially successful and if the previously known version was not. Nevertheless, current U.S. law on this subject has several confusing and undesirable features.²²¹ The law requires that a “nexus” exist between the alleged invention and the invention’s commercial success.²²² Application of

reference, of an escape from which they are not too confident. It is a meaningless platitude.”).

²¹⁹ A proposal for awarding patents on the basis of commercial nonobviousness is set forth in Karen I. Boyd, *Nonobviousness and the Biotechnology Industry: A Proposal for a Doctrine of Economic Nonobviousness*, 12 BERKELEY TECH. L.J. 311, 337–43 (1997). Boyd’s analysis differs significantly from ours because she argues that patents would be helpful where commercial success is uncertain as a result of the risk aversion of potential commercial innovators. *Id.* at 337–38. Our analysis does not depend upon risk aversion but instead focuses on the possibility that second and subsequent movers can free ride on first-movers’ market experiments by copying successes while avoiding failures. *See supra* Part II. Boyd also considers the issue only in the context of biotechnology inventions, *see* Boyd, *supra*, at 312–13, whereas we believe that the problem is more general.

²²⁰ *See* *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966) (listing “commercial success” among secondary factors that may be “indicia” of obviousness or nonobviousness); *see also* ROBERT P. MERGES & JOHN F. DUFFY, *PATENT LAW AND POLICY* 736–57 (3d ed. 2002) (noting that secondary factors, or “objective indicia,” play essential role in 35 U.S.C. § 103 determinations of nonobviousness). *But see* Robert P. Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CAL. L. REV. 803, 838–66 (1988) (arguing that commercial success may not necessarily be result of patented technology itself, but rather of market forces at work).

²²¹ *See, e.g.*, Reed W.L. Marcy, *Patent Law’s Nonobviousness Requirement: The Effect of Inconsistent Standards Regarding Commercial Success on the Individual Inventor*, 19 HASTINGS COMM. & ENT. L.J. 199, 210–17 (1996) (discussing application of inconsistent standards, burden of proof, and other issues).

²²² As the Federal Circuit recently explained:

Commercial success is relevant because the law presumes an idea would successfully have been brought to market sooner, in response to market forces, had the idea been obvious to persons skilled in the art. Thus, the law deems evidence of (1) commercial success, and (2) some causal relation or “nexus” between an invention and commercial success of a product embodying that invention, probative of whether an invention was non-obvious.

Merck & Co. v. Teva Pharms. USA, Inc., 395 F.3d 1364, 1376 (Fed. Cir. 2005).

the “nexus” test is fraught with uncertainty, and if the commercializer’s real contribution lies merely in testing the commercial viability of the product or in explaining the benefits of the innovation to the public, then the nexus requirement may be deemed unsatisfied.²²³

Our analysis suggests two possible reforms in the evaluation of commercial success as a secondary consideration in the nonobviousness inquiry. First, courts should only take into account the commercialization efforts of the patentee (or parties licensed by the patentee) in justifying a finding that the patent was nonobvious. If the defendant in an infringement trial or some other potential infringer (i.e., someone other than the patentee and its licensees) engaged in successful commercialization of a patented product without having the patent’s protections against second movers, then the patent cannot be defended as necessary, at least in part, to encourage investment in commercialization.²²⁴ Our proposed rule against weighing the commercial success of infringers in favor of patent validity would not mean that all patents initially commercialized by infringers should be held invalid. For example, if the accused infringer learned of the technology through the patent itself or the patentee’s disclosures, then the patent would seem to be serving its conventional purpose of disclosing nonobvious technical information and should probably not be invalidated. But the theory of market experimentation at least could operate at the margins of patent law to favor those who commercialize over those who do not. In otherwise close cases (and cases in which secondary considerations become relevant will tend to be close),²²⁵ it may be sensible to decide against a patentee who has not engaged in commercialization and in favor of a defendant who has. At the very least, a patentee ought not to benefit from the weak inference that a defendant’s commercial success establishes nonobviousness.

²²³ See, e.g., *Indian Head Indus., Inc. v. Ted Smith Equip. Co.*, 859 F. Supp. 1095, 1108–09 (E.D. Mich. 1994) (applying nexus test and noting that alleged infringer attributed commercial success to marketing efforts). For further discussion of the nexus requirement and the relationship between market and technology forces in driving commercial success, see *Merges*, *supra* note 220, at 859.

²²⁴ We do not mean to imply that independent invention always signifies obviousness. Different parties may hit on a nonobvious invention at the same time. For an argument that independent invention should be a defense to patent infringement, see generally Samson Vermont, *Independent Invention as a Defense to Patent Infringement*, 105 MICH. L. REV. 475 (2006).

²²⁵ At least some commentators, however, believe that the Federal Circuit has increased the importance of secondary considerations to the point where they are relevant even in cases that otherwise would not be close. See, e.g., Kevin Rhodes, Comment, *The Federal Circuit’s Patent Nonobviousness Standards: Theoretical Perspectives on Recent Doctrinal Changes*, 85 Nw. U. L. REV. 1051, 1075–76 (1991) (“The [Federal Circuit] has completely abandoned the Supreme Court’s view that [secondary considerations are] useful merely to tip the balance in close cases . . .”).

Second, courts should not discount findings of commercial success merely because that commercial success resulted from marketing expertise rather than technological skill by the patentee. We concede that the courts' desire not to count commercial success resulting from marketing excellence is somewhat supported by the theory that patents are aimed at producing valuable technical information. Under that theory, commercial success may indicate that the patented good sits in a niche in product space,²²⁶ indicating the likelihood of some important technical difference between the patent and other products. Nonetheless, the line between technological and marketing prowess can often be a fine one,²²⁷ and marketing can sometimes be successful in helping to illustrate, for customers, the distinctiveness of a particular product. Once again, our claim is not that marketing expertise alone should be sufficient to generate a patent under current U.S. law, but that in close cases, socially useful market experimentation at least ought not count against a patentee.²²⁸

²²⁶ Industrial organization analysis frequently makes use of the concept of multidimensional product space, in which each product's location depends upon its unique characteristics. See, e.g., Andrew S. Caplin & Barry J. Nalebuff, *Multi-dimensional Product Differentiation and Price Competition*, 38 OXFORD ECON. PAPERS (SUPPLEMENT) 129 (1986) (seeking to develop multidimensional location model).

²²⁷ Consider, for example, the envelopes that Netflix uses to send and receive DVDs to and from its customers. See U.S. Patent No. 6,966,484 (filed Sept. 16, 2002). One might characterize the development of these envelopes either as a technological feat or as marketing genius.

²²⁸ At least one country seems more open to the possibility of allowing patents based merely on commercial nonobviousness. Unlike the United States, India, in its newly amended patent statute, provides that the standard of patentability, or the "inventive step," can be satisfied by a feature of an invention that either involves a "technical advance" or has "economic significance." The Patents (Amendment) Act, 2005, No. 15, § 2(f), 2005 C.I.S. 32., 34 (India) (amending Patents Act, 1970, No. 39, § 2(1)(ja)), available at http://www.patentoffice.nic.in/ipr/patent/patent_2005.pdf. Commentators are divided as to the intended doctrinal significance of this change. Compare Manoj Pillai, *India: India's Patents Bill, 2005—Is It TRIPS Compliant?*, MONDAQ, Mar. 31, 2005, http://www.mondaq.com/i_article.asp_Q_articleid_E_31717 ("By bringing 'economic significance' under the definition of 'non-obviousness' what has been fundamentally diluted is a cardinal principle of patent law!"), with Archana Shanker, *India: Patent Reform; What Patent Owners Need to Know*, MANAGING INTELL. PROP. (PATENT FOCUS 2005), 2005, at 50, 50, available at <http://www.managingip.com/Article.aspx?ArticleID=1321465> ("Such a definition is more or less well accepted internationally and in all probability the term economic significance might be interpreted as being synonymous to industrial application."). The invention still is required to be "not obvious to a person skilled in the art," but the structure of the Indian statute suggests that the nonobvious quality may be economic or technical. See § 2(f) ("[I]nventive step' means a feature of an invention that involves technical advance as compared to the existing knowledge or having economic significance or both and that makes the invention not obvious to a person skilled in the art."). This statutory language at least opens the possibility that patents in India could issue on technically trivial variations of prior art if the modified invention is successfully commercialized and if that economic success would have been nonobvious to a person skilled in the art.

We conclude our analysis of the patent system by asking a daring question: Should the U.S. patent system be modified to provide rewards solely for commercialization without rewarding pretenders? We believe that current patent doctrine does have some flexibility to achieve this end, though we worry that the institutional structure of the system may be poor at identifying examples of commercial nonobviousness.²²⁹ A pure theory of patents for market experimentation would permit not only patents on smallish variations of previously failed innovations (which current law already does in part)²³⁰ but also patents on products that are not novel but have never been effectively commercialized. Consider a prophetic invention that was previously patented but never commercialized. The patent has now expired. Black-letter patent law precludes a new patent from claiming precisely the same invention²³¹ but also allows attorneys to be creative in drafting patent claim language to avoid prior art.²³² Because the attorney defines “novelty” in drafting the claim, this feature of patent law holds out the theoretical possibility that the attorney could distinguish noncommercialized prior art by restricting a claim to the “successfully commercialized” product.

One famous and illustrative example of such artful claim drafting is found in the patent at issue in *Parke-Davis & Co. v. H.K. Mulford &*

²²⁹ It is difficult enough for the patent office to handle its workload in identifying technological obviousness. The PTO has issued more than one million utility patents over the past seven years; it took well over one hundred years for the office to issue its first million utility patents. See United States Patent and Trademark Office, Issue Years and Patent Numbers, <http://www.uspto.gov/web/offices/ac/ido/oeip/taf/issuyear.htm> (last visited Mar. 5, 2008) (listing first patent number issued by PTO in each calendar year since 1836); United States Patent and Trademark Office, Great Patent Fire of 1836, <http://www.uspto.gov/web/offices/ac/ahrpa/opa/kids/special/1836fire.htm> (last visited Mar. 5, 2008) (stating that approximately 10,000 patents were issued between PTO’s founding in 1790 and Great Patent Fire of 1836). On average, patent examiners spend only about eighteen hours on each patent, and the PTO’s bonus system rewards examiners for issuing as many patents as quickly as possible. Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 Nw. U. L. REV. 1495, 1500 (2001). Given its large workload and the small amount of time spent on each patent, the PTO is probably not equipped to effectively implement a new system to determine commercial nonobviousness.

²³⁰ The variation need only be sufficiently great to make the subject matter of the patent as a whole not obvious. See 35 U.S.C. § 103(a) (2000) (“A patent may not be obtained . . . if the differences between the [invention] and the prior art are such that the [invention] would have been obvious at the time the invention was made . . .”).

²³¹ See *id.* § 102 (prohibiting grant of new patent for previously patented invention).

²³² The conventional wisdom is that a lawyer should seek to advance a range of claims, from the very broad to a “picture claim,” i.e., the narrowest claim that still has some commercial significance. E.g., Melvin C. Garner et al., *Advanced Claim Drafting and Amendment Writing Workshop for Electronics and Computer-Related Subject Matter*, in SIXTH ANNUAL PATENT PROSECUTION WORKSHOP: ADVANCED CLAIM & AMENDMENT WRITING 227, 279 (PLI Patents, Copyrights, Trademarks, & Literary Prop., Course Handbook Series No. G-464, 1996).

*Co.*²³³ The case involved a patent claim to a purified natural substance (adrenaline). The claim was attacked as invalid because the substance itself was naturally occurring; therefore, the argument went, the patent claim was not novel.²³⁴ In rejecting that argument, Judge Learned Hand reasoned that the claim to the purified natural substance should be recognized as novel because it was “for every practical purpose a new thing commercially and therapeutically.”²³⁵ Hand stressed that there were “ample practical differences” between the claimed purified substance and the prior natural substance and that the line between the novel and the non-novel should be “drawn rather from the common usages of men than from nice considerations of dialectic.”²³⁶ Judge Hand’s reasoning now undergirds entire fields of patent law; for example, most patents on DNA are claimed in the *Parke-Davis* format.²³⁷ Recognizing a claim to a “commercialized” product as novel despite an earlier patent or other document disclosing the existence of precisely the same product would be no more doctrinally difficult than the step taken by Judge Hand in *Parke-Davis*. Commercialized inventions are “for every practical purpose a new thing commercially,”²³⁸ even if the prior art discloses an uncommercialized version of identical technology.

Admittedly, courts might well reject such an approach, perhaps on the grounds that, unlike in *Parke-Davis*, it would effect a major change to the patent system rather than simply accommodate a new technology.²³⁹ Moreover, if the patent system were to permit patents on commercially new and nonobvious developments, it would need to ensure (1) that such developments really were commercially nonobvious and (2) that the patentee (or the patentee’s licensee) actually bore the risks of commercialization. The latter restriction may be the

²³³ 189 F. 95 (S.D.N.Y. 1911), *aff’d*, 196 F. 496 (2d Cir. 1912).

²³⁴ *See id.* at 103, 106 (analyzing whether substance was naturally occurring and relevance of this fact).

²³⁵ *Id.* at 103.

²³⁶ *Id.*

²³⁷ Since *Parke-Davis*, courts have recognized patents on other naturally occurring products in their purified or created forms. DNA patent claims, for example, are drafted to “clearly define an isolated and purified DNA molecule.” Eileen M. Kane, *Splitting the Gene: DNA Patents and the Genetic Code*, 71 TENN. L. REV. 707, 741 (2004).

²³⁸ *Parke-Davis*, 189 F. at 103.

²³⁹ The *Parke-Davis* approach, however, should be recognized in a subset of cases in which the inventor’s achievement is in identifying a naturally occurring phenomenon for market experimentation. Consider, for example, Allerca’s identification of cats that have a mutation that prevents them from producing dander and thus causing allergies. *See* Elisabeth Rosenthal, *Cat Lovers Lining Up for No-Sneeze Kitties*, N.Y. TIMES, Oct. 6, 2006, at A14 (describing how Allerca discovered that such cats exist). In our view, Allerca should be able to patent the cats that have been screened and commercialized and not just the test for identifying such cats.

easier of the two to achieve. Where a patentee has obtained a patent on the grounds that commercialization of the product is the difficult and nonobvious step, the patent could be invalidated if the patentee did not engage in commercialization.²⁴⁰ In such a case, the courts would refuse to recognize the patentee as the true “inventor” of the commercialized version. Similarly, if other parties engaged in commercialization in parallel with the patentee, those parallel efforts would provide strong evidence that commercialization was not risky and that the economic prospects of the commercialized product were not nonobvious.

Despite these limitations to existing patent doctrine, “commercialization patents” could still produce economic harm if the patent office were generally unable to identify instances of commercial non-obviousness. If the patent office were to issue patents on developments that could obviously be successfully commercialized, such patents should be invalidated by the courts if multiple parties besides the patentee engage in simultaneous commercialization. In theory, the prospect of invalidation may be sufficient to encourage competitors to enter the market despite the existence of the patent—but the patent may chill entry if, as seems likely, competitors view litigation as risky and uncertain.²⁴¹ A common uncertainty would be whether additional entry occurred independent of the patentee’s efforts or as a result of the patentee’s market experimentation. And in the absence of widespread entry, a question would be whether additional entry would have occurred but for the prospect of litigation.

Thus, commercialization patents may be economically beneficial only if the PTO is good enough at identifying instances of commercial nonobviousness. The current structure of the PTO, under which examiners have little time and dubious incentives to evaluate the merits of an application, seems unlikely to produce accurate judg-

²⁴⁰ Even this inquiry might be difficult, because patentees might seek to engage in minimal commercialization just to preserve their patent rights. Michael Abramowicz, *The Danger of Underdeveloped Patent Prospects*, 92 CORNELL L. REV. 1065, 1107 (2007). Pseudocommercialization might be harmful both because it might involve wasteful expenditures and because it might succeed in converting a true commercial innovator into an infringer. Courts would thus need to ensure that the patentee engaged in sufficient commercialization in order to reach a conclusion as to whether commercialization was economically feasible.

²⁴¹ Patent litigation is already notoriously uncertain. Claim-construction disputes are not finally resolved until the parties are before the Federal Circuit, even though parties are required to litigate their claims fully either through trial or summary judgment prior to proceeding to the Federal Circuit in the first place. See Gretchen Ann Bender, *Uncertainty and Unpredictability in Patent Litigation: The Time Is Ripe for a Consistent Claim Construction Methodology*, 8 J. INTELL. PROP. L. 175, 202–09 (2001) (discussing uncertainty associated with claim construction).

ments about market viability.²⁴² Indeed historically, the PTO has tried to avoid making judgments about marketability. A different institutional structure might help. The PTO is now engaged in a new experiment to provide for “peer review” of patent applications.²⁴³ Under this method, the PTO widely distributes patent applications by posting them on the Internet.²⁴⁴ In theory, the office will receive comments on the patent applications from a large variety of sources. Such a system might be successful at generating information concerning commercial nonobviousness. Indeed, the applications that under our current system might evoke guffaws from peer commentators may be precisely the ones that the PTO should grant, if the peers’ ridicule stems from a shared belief that the subject matter in the application is commercially fanciful.

In general, we believe that the proposed modification of the patent system to allow for some “commercialization” patents holds sufficient promise that it should be considered in cases where the hurdles to commercialization seem particularly daunting. An initial experiment could be limited to a particular market area in which experiments seem especially unlikely in the absence of patent protection.²⁴⁵ Nevertheless, we recognize that the patent system may not be the optimal system for encouraging market experimentation and that, given institutional realities, patent protection could well do more harm than good.

CONCLUSION

We have argued that technical and market experimentation are parallel phenomena, both underprovided in the absence of property rights. Why then have intellectual property practice and theory

²⁴² See Megan Barnett, *Patents Pending*, U.S. NEWS & WORLD REP., June 10, 2002, at 33, 34 (noting that examiners have twenty hours on average to complete all work on application and that work incentives established by PTO reward “speed, not quality”); see also NAT’L ACAD. OF PUB. ADMIN., US PATENT AND TRADEMARK OFFICE: TRANSFORMING TO MEET THE CHALLENGES OF THE 21ST CENTURY 99–107 (2005), available at http://www.aipla.org/Content/ContentGroups/Issues_and_Advocacy/Comments2/Patent_and_Trademark_Office/20055/NAPAFullReport.pdf (detailing criticisms of PTO’s production criteria for examiners and concluding that agency should “[u]pdate [its] production and quality standards and awards”).

²⁴³ See John J. Doll, U.S. Patent & Trademark Office, Official Gazette Notice: Pilot Concerning Public Submission of Peer Reviewed Prior Art (June 4, 2007), <http://www.uspto.gov/web/offices/com/sol/og/2007/week26/patsuba.htm> (discussing pilot program for submission of public comment on patent submissions); Peer to Patent, <http://www.peertopatent.org> (last visited Mar. 4, 2008) (providing peer review, in cooperation with PTO, of patent submissions).

²⁴⁴ See *supra* note 243.

²⁴⁵ Karen Boyd argues that biotechnology is one such area. See *supra* note 219 and accompanying text.

focused on the former to the near exclusion of the latter? A partial answer, we believe, lies in Harold Demsetz's general theory of property rights. Demsetz noted that "property rights develop to internalize externalities when the gains of internalization become larger than the cost of internalization."²⁴⁶ Rights in technological innovation may have developed later than rights in real and personal property because intellectual property rights are more amorphous and the "cost of internalization" is therefore higher. Rights in market innovation may be more amorphous still, and the costs associated with any attempt by government officials to delineate these rights individually might have greater costs than benefits. With growing economies, however, the benefits of potential market innovation should increase over time, and improved legal technology holds the promise of decreasing the cost of internalization. As the possibility of institutions that can efficiently identify market innovation comes closer, theorists in turn should expand their models to incorporate all the types of information that intellectual property could, in theory, protect.

A market experimentation theory does not, however, necessarily lead to more and more expansive theories of intellectual property. Current intellectual property doctrine shows that courts and the legislature are sympathetic to the plight of first movers who engage in risky market experimentation. If this desire to foster market experimentation were more explicitly recognized, then courts and legislatures may be better able to tailor the law. As we have shown, more explicit recognition of market experimentation might limit copyright terms, limit the injunction rights of a patentee who did not commercialize vis-à-vis an infringer who did, and invalidate "paper patents" that claim trivial, uncommercialized technological changes.

Encouraging market experimentation thus currently operates on the margins of intellectual property fields that are conventionally justified on other bases. The question remains as to whether, in the future, a branch of intellectual property should be developed that more precisely targets the encouragement of undertaking of entrepreneurial risk and market experimentation. We must candidly acknowledge that such a development is unlikely to be easy. Just as it would be surprising if intellectual property doctrine did not already encourage market experimentation to a limited extent, it would also be surprising if a few doctrinal tweaks could provide a robust and thoroughgoing system to encourage the optimal level of market exper-

²⁴⁶ Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. 347, 350 (1967) ("Increased internalization, in the main, results from changes in economic values, changes which stem from the development of new technology and the opening of new markets, changes to which old property rights are poorly attuned.").

imentation. A likely reason for the law's relative lack of attention to market experimentation is that the relevant institutional players, such as patent examiners, legislators, and judges, are not well positioned to make judgments about which market experiments deserve protection. We should expect instead that when we do try to imagine institutions that would provide appropriately tailored rights protecting market experimentation, these institutions would be very different from those that currently exist. They may even be sufficiently radical that we can only imagine them being implemented in countries in which the need is particularly great²⁴⁷ or in societies comfortable with novel legal mechanisms. Such possibilities open promising avenues for future research.

²⁴⁷ See *supra* notes 52–54 and accompanying text (discussing literature on need for intellectual property innovation in developing countries).