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**Anticompetitive Innovation and the Quality
of Invention**

Alan Devlin & Michael Jacobs

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ANTICOMPETITIVE INNOVATION AND THE QUALITY OF INVENTION

Alan Devlin[†] & Michael Jacobs^{‡‡}

ABSTRACT

When, if ever, should antitrust condemn an act of invention? This Article addresses the challenging question of how best to judge predatory-invention claims, and under what standard courts should go about the formidable task of weighing the quality of a challenged improvement. It rejects as variously unworkable, incongruous, or incomplete the conflicting legal standards espoused by the D.C., Second, Ninth, and Federal Circuits.

After considering several pertinent issues, the Article advocates the following test: if an impugned act of invention does not foreclose, but merely disadvantages, rival products, it should be per se lawful. If the challenged innovation effectively excludes entry into the relevant market, an antitrust violation should follow if the plaintiff demonstrates, and the defendant fails to rebut, the absence of a genuine technological improvement. The Article defines “genuine” as reflecting a calculable premium that consumers would pay for the improved-upon alternative(s), even if the extent of that price differential falls short of the level required to place the new product in a distinct antitrust market.

In determining the quality of an invention, courts should not draw an inference of technological merit from the fact that the U.S. Patent & Trademark Office has issued a patent, nor should evidence of predatory intent play a role in the analysis. The Article also recommends jettisoning from antitrust analysis the concept of “coercion.” The Article concludes by applying its test to the quintessential example of predatory innovation: product hopping in the pharmaceutical industry.

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The views expressed in this Article are solely those of the authors.

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I. INTRODUCTION

That the law should promote innovation is an unquestioned precept of modern public policy.¹ Economists continue to debate which form of industrial organization—competition or monopoly—encourages more innovation.² However, the vast majority have long agreed that the economic benefits flowing from invention dwarf those from all other sources of economic advancement combined.³ Yet, plaintiffs routinely challenge the “predatory” inventions of dominant firms on the ground that these inventions wrongfully exclude small rivals in violation of the antitrust laws.⁴ The questions of whether and when the law should condemn such instances of technological improvement are among the most divisive in the field of competition policy today.⁵

Lawsuits alleging predatory innovation implicate complex policy questions, such as the nature of invention; the difficulties of comparing the long-term benefits of bona fide technological improvements with short-term harms that might arise when a dominant firm excludes a smaller rival; and issues of institutional competence. A larger question asks whether courts should entertain such claims at all. If they do hear such cases, should the judiciary evaluate claims of improvement by looking to consumer purchasing decisions, by deferring to the decision of the U.S. Patent and Trademark

1. See, e.g., U.S. DEP’T OF JUSTICE (DOJ), COMPETITION AND MONOPOLY: SINGLE-FIRM CONDUCT UNDER SECTION 2 OF THE SHERMAN ACT 1 (2008), available at <http://www.usdoj.gov/atr/public/reports/236681.pdf> (observing that innovation is “the most important source of economic growth”).

2. This debate is best encapsulated by the long-running dispute between Joseph Schumpeter and Kenneth Arrow as to whether monopoly or competition is the best driver of technological advancement. Compare JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM, AND DEMOCRACY (3d ed. 1950), with Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in NAT’L BUREAU OF ECON. RESEARCH, THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 609 (1962).

3. See, e.g., ARTI RAI, STUART GRAHAM & MARK DOMS, U.S. DEP’T OF COMMERCE, PATENT REFORM: UNLEASHING INNOVATION, PROMOTING ECONOMIC GROWTH & PRODUCING HIGH-PAYING JOBS 1 (2010), available at http://www.commerce.gov/sites/default/files/documents/migrated/Patent_Reform-paper.pdf (linking innovation to three-quarters of the U.S. economy’s post-World War II growth).

4. See cases discussed *infra* Section II.B.

5. The single most divisive recent case implicating this tension involved the United States and European Union proceedings against Microsoft. See generally WILLIAM H. PAGE & JOHN E. LOPATKA, THE MICROSOFT CASE: ANTITRUST, HIGH TECHNOLOGY, AND CONSUMER WELFARE (2007). More generally, see Claudette Espanol, *The Federal Circuit: Jurisdictional Expansion into Antitrust Issues Relating to Patent Enforcement*, 2 SETON HALL CIRCUIT REV. 307, 307–08 (2005); Michael J. Meurer, *Vertical Restraints and Intellectual Property Law: Beyond Antitrust*, 87 MINN. L. REV. 1871, 1871–76 (2003).

Office (“PTO”) to grant a patent, by appealing to expert testimony from engineers and scientists in the field, or by some combination of these?

The proper substantive test for evaluating such inventions is hardly self-evident. Should a modicum of improvement shield the defendant from antitrust liability, or should legality turn on the outcome of a cost-benefit analysis that weighs the value of the improvement against the cost of suppressed competition? These questions are made more difficult by long-debated issues concerning the industry structure that best fosters innovation.⁶ Perhaps most importantly, the courts’ systemic capacity to err in quantifying the social value of an invention, as well as its short- and long-run competitive effects, necessitates a central role for decision theory.⁷ But what form should that theory take? Deeming a material propensity for Type I errors (“false positives”) to be unacceptable in light of the perverse incentives generated by condemning socially valuable innovation, one might err strongly on the side of permissibility.⁸ Those who are sanguine about courts’ ability to distinguish nugatory from genuine acts of invention, however, might seek to reduce the incidence of Type II errors (“false negatives”) by taking claims of predatory innovation more seriously.⁹

Famous examples of allegedly anticompetitive innovation abound. In the 1970s, Kodak launched its successful Kodacolor II system, which used a new camera format and film that disadvantaged Kodak’s competitors in the film and photofinishing markets. Kodak’s actions led these competitors to argue that antitrust law should impose a duty on dominant firms to disclose technological changes in advance if they could harm rivals.¹⁰ In the same decade, competitors accused IBM of designing its products to render them

6. See *supra* note 2; see also Jonathan B. Baker, *Beyond Schumpeter Versus Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L.J. 575 (2007); Michael A. Carrier, *Two Puzzles Resolved: Of the Schumpeter-Arrow Stalemate and Pharmaceutical Innovation Markets*, 93 IOWA L. REV. 393, 396 (2008) (discussing the status of the debate). See generally Harry S. Gerla, *Restoring Rivalry as a Central Concept in Antitrust Law*, 75 NEB. L. REV. 209 (1996); Richard Gilbert, *Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate?*, 6 INNOVATION POL’Y & ECON. 159 (2006).

7. See generally Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1 (1984); Geoffrey A. Manne, *Innovation and the Limits of Antitrust*, 6 J. COMPETITION L. & ECON. 153 (2010).

8. See, e.g., Thomas B. Leary, *The Essential Stability of Merger Policy in the United States*, 70 ANTITRUST L.J. 105, 134–35 (2002); D. Daniel Sokol, *Antitrust, Institutions, and Merger Control*, 17 GEO. MASON L. REV. 1055, 1062 (2010).

9. A Type I error, or false positive, occurs in this context when a court mistakenly condemns as anticompetitive an invention that promotes long-run consumer welfare discounted to present value. A Type II error, or false negative, takes place when a court finds that an anticompetitive innovation does not violate the antitrust laws.

10. See *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263, 279 (2d Cir. 1979).

incompatible with the competitors' goods.¹¹ In the late 1990s, Microsoft's bundling of its operating system and Internet-browsing software (a technological tie-in) resulted in serious antitrust liability.¹² Most recently, Google's quest to scan all of the world's books and to make them searchable online—an innovation of epic proportion—ran into antitrust trouble when the company sought to settle a class-action lawsuit alleging massive copyright infringement.¹³ The U.S. District Court for the Southern District of New York refused to approve the settlement, in part because it would grant Google, but not its competitors, rights over so-called “orphan works” (in-copyright works for which the rights holders are unidentifiable).¹⁴

This Article argues that the law should decline to entertain an antitrust challenge where the impugned invention, modest though it may be, does not prevent the marketing of rival products. But where the challenged innovation forecloses market entry, thus eliminating rather than simply reducing consumer choice, this Article advocates a standard that would render the impugned behavior illegal if a plaintiff proves, and the defendant fails to rebut, the absence of a genuine technological improvement. A “genuine” improvement in this context is a feature that consumers would pay a premium to acquire, though the necessary premium is less than the five to ten percent over the existing price that often accompanies market-definition analysis.¹⁵ Under this proposed standard, an exclusionary “invention” that transforms a product into a pure substitute in the eyes of consumers would violate the antitrust laws.¹⁶

11. See *Memorex Corp. v. IBM*, 636 F.2d 1188 (9th Cir. 1980) (per curiam); *Cal. Computer Prods. v. IBM*, 613 F.2d 727, 731 (9th Cir. 1979); *In re IBM Peripheral EDP Devices Antitrust Litig.*, 481 F. Supp. 965 (N.D. Cal. 1979), *aff'd*, 698 F.2d 1377, 1382 (9th Cir. 1983).

12. See *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001).

13. *Authors Guild v. Google Inc.*, 770 F. Supp. 2d 666, 669 (S.D.N.Y. 2011). A number of prominent scholars argued that the Google Books Search settlement would have created antitrust issues, though other leading academics disagreed. Compare, e.g., Randal C. Picker, *The Google Book Search Settlement: A New Orphan-Works Monopoly?*, 5 J. COMPETITION L. & ECON. 383 (2009), and Pamela Samuelson, *Google Book Search and the Future of Books in Cyberspace*, 94 MINN. L. REV. 1308 (2010), with Einer Elhauge, *Why the Google Books Settlement Is Procompetitive*, 2 J. LEGAL ANALYSIS 1 (2010), and Jerry A. Hausman & J. Gregory Sidak, *Google and the Proper Antitrust Scrutiny of Orphan Books*, 5 J. COMPETITION L. & ECON. 411 (2009).

14. *Authors Guild*, 770 F. Supp. 2d at 682–83.

15. Given patent law's minimalist reading of the utility requirement, we would not view the fact that the PTO has issued a patent to be sufficient proof of a genuine improvement.

16. Thus, if consumers mistakenly pay a premium for a new product over a withdrawn product based on what they erroneously perceive to be a qualitatively material improvement, no antitrust violation would result under this Article's proposed test. As explained below, the disproportionate costs of erroneously condemning real acts of invention (Type I errors)

Thus, the elimination, rather than the reduction, of consumer choice should be a prerequisite of an antitrust violation. Imagine that consumers, through their purchasing decisions, were to signal a greater preference for a dominant firm's purportedly "improved" product than for a rival plaintiff's product. Under this Article's proposed test, such a product introduction would necessarily be lawful, even if market research demonstrated that the "premium" for the improved good resulted entirely from marketing and advertising, rather than from a technologically cognizable improvement.

One might be tempted to expand the scope of potential illegality by adopting the principle that consumer choice is not meaningful when it is fettered, or otherwise subject to some "improper" influence. One would then entertain antitrust claims against an "improved" good for which consumers display a predilection when their demand is in some respect irrational, or skewed by market conditions or by the defendant's own conduct. This Article rejects such an approach because it would eliminate a meaningful role for consumers in judicial assessments of the legitimacy of an innovation. Myriad influences invariably hinder consumers' ability to act as perfectly neutral and accurate arbiters of technological quality, even in competitive markets. In the consumer-focused field of antitrust, however, the individual purchasers' market-revealed preferences are entitled to deference, and courts ought not to second-guess them *ex post*. It is only where an alleged act of predatory innovation denies consumers a choice between rival products that rule-of-reason analysis is appropriate.

A necessary result of this standard is that, over time, some inventions that produce long-run social costs will escape antitrust condemnation.¹⁷ This is the necessary price for ensuring that exclusivity continues to operate as an appropriate mechanism for rewarding invention. A more open-ended antitrust standard, which might employ an all-encompassing cost-benefit calculus to determine legality, would do great harm to legal certainty and thus create an unacceptable risk of corrupting innovation incentives.

To explore this thesis, the Article applies our analysis to what many might consider to be the quintessential example of predatory innovation: "product hopping." Product hopping occurs when a pioneer pharmaceutical firm switches consumers from one form or dosage of its product—typically, a product for which the patent will soon expire—to another form or dosage

justify an antitrust standard that deliberately accepts a relatively greater incidence of Type II errors. *See infra* Section IV.C.

17. *See, e.g.*, Lawrence M. Frinkel, *The Flawed Institutional Design of U.S. Merger Review: Stacking the Deck Against Enforcement*, 2008 UTAH L. REV. 159, 159 (observing that under-enforcement results in a "greater number of false negatives than false positives").

of that product, in order to maintain the product's profitability. This behavior usually occurs at the expense of competition from a generic prepared to compete with the original formulation.¹⁸ Some consider this practice to be both bereft of plausible benefit and unfairly manipulative of the statutory framework governing the marketing of pharmaceuticals.¹⁹ Nevertheless, consistent with our proposed rule, this Article argues that this practice should be lawful when it leaves generic-drug producers free to enter the market. Moreover, because the phenomenon of product hopping is the natural result of the regulatory infrastructure applicable to the pharmaceutical industry, in most instances, it does not lend itself to an effective judicial solution.²⁰

In sum, the problem of anticompetitive innovation is a confoundingly difficult one. The U.S. Supreme Court has never ruled on a case involving predatory innovation. Since the late 1960s, however, various circuit courts of appeals have decided a significant number of such cases.²¹ None of those decisions offer a coherent approach to the perceived problem of predatory innovation, and some are downright confusing. Each decision suffers from the same dilemma: assuming that the new product differs in some respect from the old one, how is a court to determine whether that difference offers consumers a benefit sufficient to justify the short-term loss of competition? Is any benefit enough? Or must it exceed some quantitative or qualitative baseline? And who is to judge the fact and nature of the alleged benefit—the court? consumers? technical experts? the PTO?

This Article seeks to provide some answers to those questions. Part II discusses the phenomenon of predatory innovation and critiques the leading case law that has addressed that issue. Part III identifies three factors that courts have used to shed light on the question of whether a product design is predatory, and it explains why the law should revisit those factors. Part IV articulates our preferred legal rule for analyzing alleged instances of exclusionary invention. Part V deals with product hopping as an industry-specific example of predatory innovation—one that presents the same analytical problems as the general-run cases, and that, like them, has no easy solution. A brief conclusion follows.

18. See, e.g., Michael A. Carrier, *Provigil: A Case Study of Anticompetitive Behavior*, 3 HASTINGS SCI. & TECH. L.J. 441, 446–48 (2011).

19. See *infra* note 180.

20. See *infra* Part V.

21. See *supra* note 11.

II. JUDICIAL ANALYSIS OF PREDATORY INNOVATION

A. THE PARADOX OF HARMFUL INNOVATION

Claims of “anticompetitive innovation”²² sound oxymoronic. As innovation is of exceptional economic importance—a 2010 report by the U.S. Department of Commerce tied three-quarters of U.S. post-World War II economic growth to innovation²³—one might plausibly think that the judiciary should never condemn it. Yet, the law bears the potential to stymie invention and the growth that it produces.²⁴ This follows from the fact that one company’s successful invention may seriously disadvantage its rivals or even render them insolvent.²⁵ Rivals thus aggrieved will predictably seek recompense through the legal system, if permitted to do so.²⁶ An antitrust policy that is both uncritically hostile to monopolization and devoted to ensuring viable competition through equality of opportunity may wrongly condemn inventions that fortify inventors’ dominance.²⁷ Competition policy must be alert to this threat, and courts should summarily reject allegations of monopolization founded on acts of genuine invention.²⁸

Claims of antitrust harm arising from consumer-pleasing acts of innovation are necessarily ill founded. But what should the law make of allegations that a dominant defendant strategically engaged in illusory acts of

22. See, e.g., John E. Lopatka, *United States v. IBM: A Monument to Arrogance*, 68 ANTITRUST L.J. 145, 157–58 (2000).

23. RAI, GRAHAM & DOMS, *supra* note 3.

24. See, e.g., Ronald A. Cass, *Copyright, Licensing, and the “First Screen,”* 5 MICH. TELECOMM. & TECH. L. REV. 35, 70 (1999) (noting the danger that “the antitrust laws [have] become captive of well-placed firms in search of an industrial policy that protects declining firms against more successful firms—an outcome likely to frustrate innovation”).

25. See, e.g., Herbert Hovenkamp, *Exclusive Joint Ventures and Antitrust Policy*, 1995 COLUM. BUS. L. REV. 1, 24 (“Innovation injures non-innovating rivals of the innovated product even if these rivals were formerly behaving competitively. . . . It may even put some or even all of the makers of the older product out of business.”).

26. See Joseph F. Brodley, *Antitrust Standing in Private Merger Cases: Reconciling Private Incentives and Public Enforcement Goals*, 94 MICH. L. REV. 1, 49 (1995); see also Daniel A. Crane, *Antitrust Antifederalism*, 96 CALIF. L. REV. 1, 39 (2008) (noting that “[a]bout two-thirds of private enforcers of antitrust are aggrieved competitors or other businesses vertically related to the defendant”).

27. This follows in part from the fact that distinguishing predatory from efficient conduct is far from straightforward. See, e.g., Frank H. Easterbrook, *On Identifying Exclusionary Conduct*, 61 NOTRE DAME L. REV. 972, 972 (1986) (“Aggressive, competitive conduct by a monopolist is highly beneficial to consumers. Courts should prize and encourage it under the antitrust laws. Aggressive, exclusionary conduct by a monopolist is deleterious to consumers. Courts should condemn it under the antitrust laws. There is only one problem. Competitive and exclusionary conduct look alike.”).

28. See, e.g., John E. Lopatka & William H. Page, *Posner’s Program for the Antitrust Division: A Twenty-Five Year Perspective*, 48 SMU L. REV. 1713, 1736–37 (1995).

innovation—i.e., those lacking technological merit or any cognizable qualitative improvement over a prior product—in order to exclude rivals? As a threshold matter, one might question the plausibility of any such claim because the competitive harm suffered by an inventor’s competitors is directly related to the quality of the relevant invention. After all, one company’s revolutionary invention can drive its competitors into bankruptcy and create a monopoly.²⁹ Conversely, the more prosaic the marketed innovation, the less significant the competitive disadvantage suffered by the innovator’s rivals.³⁰ Such principles might suggest that courts should categorically reject claims of “predatory innovation,” for genuine exclusion is plausible only where a new technology renders competitors’ products partially or largely defunct.

Are all claims of predatory innovation therefore spurious? At least as a matter of theory, the answer is no.³¹ Under certain conditions, trivial acts of invention can exclude rivals on qualitatively improper grounds.³² When consumers are incapable of effectively distinguishing between various technologies, or when a regulatory mechanism governing entry lends itself to manipulation, strategic product development may frustrate rivals’ efforts either to enter the market with substitute products or to introduce superior technologies.³³ In other instances, the owner of an upstream platform can achieve proprietary control over significant swathes of downstream markets by rendering the platform interoperable only with its own or its licensees’ downstream goods and services.³⁴ The monopolists’ redesign of their products can then enable them to vertically integrate, and thus eliminate their downstream competitors.³⁵ Although such integration is usually efficient,³⁶

29. See, e.g., Frank H. Easterbrook, *The Chicago School and Exclusionary Conduct*, 31 HARV. J.L. & PUB. POL’Y 439, 440 (2008) (observing that “[a]ntitrust law and bankruptcy law go hand in hand”); Hovenkamp, *supra* note 25, at 24.

30. Cf. Lee Goldman, *The World’s Best Article on Competitor Suits for False Advertising*, 45 FLA. L. REV. 487, 505 (1993) (noting that “competitors have no incentive to bring” lawsuits where the practice has had “little impact on any individual competitor”).

31. See, e.g., Jonathan Jacobson, Scott Sher & Edward Holman, *Predatory Innovation: An Analysis of Allied Orthopedic v. Tyco in the Context of Section 2 Jurisprudence*, 23 LOY. CONSUMER L. REV. 1, 27 (2010) (opining that “[i]nnovation through redesign can marginally improve a product, but with overriding damage to the competitive process”).

32. See, e.g., Nicholas Economides & William N. Hebert, *Patents and Antitrust: Application to Adjacent Markets*, 6 J. ON TELECOMM. & HIGH TECH. L. 455, 480 (2008).

33. See, e.g., *id.*

34. See, e.g., Pamela Samuelson & Suzanne Scotchmer, *The Law and Economics of Reverse Engineering*, 111 YALE L.J. 1575, 1617 (2002).

35. See, e.g., Dennis W. Carlton, *Economic Analysis of Antitrust Issues Raised by E-Commerce*, 1236 PLI/CORP. 121, 174 (2001).

and hence desirable, it may sometimes yield anticompetitive exclusionary effects.³⁷

In theory then, a nonexistent or insignificant “improvement” can delay or eliminate the onset of competition, reducing levels of static efficiency without a concomitant and offsetting dynamic-efficiency gain.³⁸ Theoretical risks, though, do not necessarily beget actual anticompetitive outcomes. In most cases, consumers’ ability to make qualitative comparisons, inventors’ incentives to maximize profit, and opportunities for third-party technological development render claims of predatory innovation highly suspect.³⁹ Nevertheless, in those limited cases where dominant companies can strategically innovate to harm competition, antitrust condemnation should presumably follow.⁴⁰ In practice, however, identifying genuine instances of anticompetitive exclusion presents a number of intractable difficulties.⁴¹ As this Article argues, these challenges are often preclusive, which necessitates the law’s permitting at least some acts of anticompetitive innovation to go unaddressed.

B. THE COURTS’ UNSATISFACTORY ANALYSIS OF PREDATORY-INNOVATION CLAIMS

In the past fifteen years, three circuit courts of appeals have announced three very different standards for analyzing claims of predatory innovation. All three are unsatisfactory, though for different reasons. One approach permits the dominant firm to introduce any new product that constitutes an “improvement” of its earlier version.⁴² The second applies a fully fledged balancing test to determine whether or not a new product is predatory.⁴³ The third looks to consumers’ response to the new product: if consumers preferred it to the product’s predecessor, there is no predatory effect.⁴⁴ The

36. See, e.g., James C. Cooper et al., *Vertical Antitrust Policy as a Problem of Inference*, 23 INT’L J. INDUS. ORG. 639, 658 (2005); see also Andy C.M. Chen & Keith N. Hylton, *Procompetitive Theories of Vertical Control*, 50 HASTINGS L.J. 573, 575–80 (1999).

37. See, e.g., Steven C. Salop & David T. Scheffman, *Raising Rivals’ Costs*, 73 AM. ECON. REV. 267, 267 (1983); see also Richard A. Posner, *Vertical Restraints and Antitrust Policy*, 72 U. CHI. L. REV. 229, 229–30 (2005).

38. See, e.g., Janusz A. Ordover, Alan O. Sykes & Robert D. Willig, *Predatory Systems Rivalry: A Reply*, 83 COLUM. L. REV. 1150, 1151 (1983).

39. See Joseph Gregory Sidak, *Debunking Predatory Innovation*, 83 COLUM. L. REV. 1121 (1983).

40. See Easterbrook, *supra* note 29, at 443.

41. See *id.*

42. *Allied Orthopedic Appliances, Inc. v. Tyco Health Care Grp.*, 592 F.3d 991, 998–99 (9th Cir. 2010).

43. *United States v. Microsoft Corp.*, 253 F.3d 34, 59 (D.C. Cir. 2001).

44. *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340 (Fed. Cir. 1998).

following pages discuss each of these approaches, explaining their respective limitations and using them to illustrate the difficulty of crafting effective antitrust rules to govern claims of exclusionary invention.

1. *The Ninth Circuit's Normatively Incomplete Rule: Minimally Significant Improvement as a Bar to Antitrust Liability*

The Ninth Circuit is the most recent federal appellate court to grapple with the difficult antitrust questions that claims of predatory invention implicate. In *Allied Orthopedic Appliances, Inc. v. Tyco Health Care Group*,⁴⁵ a group of hospitals and other health care providers alleged, among other things, that Tyco held a dominant position in the pulse-oximetry market—the market for sensors and monitors that read and display a patient's level of blood oxygenation.⁴⁶ Plaintiffs asserted that Tyco's dominance arose in significant part from a patent on its technology and that, when the relevant patent expired, generic sensors compatible with Tyco's monitors would quickly enter the market and erode Tyco's dominance.⁴⁷ In anticipation of that prospect, plaintiffs alleged, Tyco developed and marketed new, patented monitors and sensors that employed new and more efficient features that were incompatible with generic sensors.⁴⁸

Plaintiffs claimed that, by acting in the manner described above, Tyco had unlawfully maintained its monopoly power through the “predatory” redesign of its sensors and monitors, in violation of Section Two of the Sherman Act.⁴⁹ The Ninth Circuit rejected that claim, affirming the district court's ruling that Tyco's design change was not predatory. The court held more generally that a dominant firm's design change that improves its flagship product in some way and is not associated with separate anticompetitive conduct does not violate Section Two.⁵⁰ In reaching this conclusion, the court rejected plaintiffs' argument that the proper standard should weigh the benefits of product redesign against its anticompetitive effects, and it thus declined to adopt the D.C. Circuit's multi-factor balancing approach,⁵¹ discussed in Section II.B.2, *infra*. Any such test, the Ninth Circuit concluded, would pose serious problems of judicial administration and doctrinal coherence.⁵²

45. 592 F.3d 991.

46. *Id.* at 994.

47. *Id.* at 1001.

48. *Id.* at 995.

49. *Id.* at 1002.

50. *Id.* at 998–1003.

51. *Id.* at 1000.

52. *Id.* at 998–1000.

As to Tyco's change in design, the court pointed to undisputed evidence that the change was an unequivocal "improvement" as the new sensors provided more efficient calibration than their predecessors. The court also placed significant weight on the fact that the PTO had granted Tyco a patent on the new sensors.⁵³ In response to plaintiffs' argument that their evidence indicated that Tyco had hoped its redesign would forestall generic entry, the court held "[s]tatements of an innovator's intent to harm a competitor through genuine product improvement are insufficient by themselves to create a jury question under Section [Two]."⁵⁴ Finally, the court found that Tyco had not used its market power to force consumers to purchase its new sensors and monitors.⁵⁵ Although Tyco discontinued its previous line of monitors, the court observed, other monitor makers were competing in the relevant market.⁵⁶

Although the court was right to conclude that improving a product should not give rise to an antitrust claim, the Ninth Circuit's analysis leaves unresolved several issues at the core of predatory-innovation claims. Most obviously, although it purported to eschew any formal calculus as to the net welfare gains of the relevant innovation, the court based its analysis on the conceded fact that the design change was superior.⁵⁷ Yet, many future cases are bound to entail disputes about the genuineness and extent of any proclaimed invention. In circumstances where the fact and degree of a purported improvement are debatable, the court provided no guidance, implicit or otherwise, as to whether the requisite antitrust analysis would be different.

Second, consumers' ability to reveal their preference for the improved product vis-à-vis the rivals' competing goods was central to the Ninth Circuit's ruling.⁵⁸ As the alleged instance of predatory innovation did not deprive consumers of freedom of choice, the market could act as a credible (perhaps dispositive) arbiter of qualitative improvement. Tyco's competitors remained free to market alternative, albeit non-infringing, monitors, leaving market processes and consumer choice intact. Given the presence of post-improvement competition, the court did not need to confront the question of what the result would have been if Tyco had withdrawn its earlier products from the market, leaving consumers with less, or no, choice of

53. *Id.* at 1000–01.

54. *Id.* at 1001.

55. *Id.* at 1002.

56. *Id.*

57. *Id.* at 994.

58. *See id.*

alternatives, or the question of whether that withdrawal would constitute the separate anticompetitive act required by its test.

A third issue concerns the role of the PTO. The determination by an expert administrative agency that the claimed invention deserved a twenty-year exclusive right on account of its novelty, utility, and non-obviousness would strike many observers as noteworthy.⁵⁹ In the quest to evaluate the quality of invention for antitrust purposes, however, should this fact be dispositive or simply relevant?⁶⁰ Might it conceivably be immaterial in light of the PTO's low threshold for utility?⁶¹ The Ninth Circuit thought it worthy of consideration.⁶² Indeed, the first piece of evidence that it considered in determining the fact and quality of invention was "the existence of a patent on a new product design."⁶³ The court concluded that it was "evidence that the change [was] an improvement over previous designs."⁶⁴ Since, however, a product change that is arguably novel and useful in satisfaction of the Patent Act might not necessarily "improve" the product, courts might need to assess the fact of improvement without regard to the issuance of a patent for the change.

2. *The D.C. Circuit's Unworkable Balancing Test*

By forgoing a balancing test in favor of a more definitive approach, the Ninth Circuit implicitly rejected the analysis of the U.S. Court of Appeals for the District of Columbia Circuit in *United States v. Microsoft Corp.*⁶⁵ One of the claims in that case was that Microsoft's integration of its Internet Explorer web browser with its operating system constituted a predatory design change intended to afford it monopoly power in the browser market and thus enable it to remain dominant in the market for PC operating systems.⁶⁶ The plaintiff alleged three separate ways in which the integration was predatory, and the D.C. Circuit analyzed each of those allegations pursuant to a balancing test of its own making.

59. See 35 U.S.C. §§ 101–103 (2010).

60. See, e.g., Peter M. Boyle, Penelope M. Lister & J. Clayton Everett, Jr., *Antitrust Law at the Federal Circuit: Red Light or Green Light at the IP-Antitrust Intersection?*, 69 ANTITRUST L.J. 739, 797 (2002) ("The notion that the patent laws confer some affirmative right to modify patented products, thereby implicitly exempting patentees from antitrust liability for predatory product modifications, makes little sense given the nature of the patent right.").

61. See, e.g., M. Scott McBride, Note, *Patentability of Human Genes: Our Patent System Can Address the Issues Without Modification*, 85 MARQ. L. REV. 511, 523 (2001) (observing that "the utility requirement appears to be minimal").

62. *Tyco*, 592 F.3d at 1000–01.

63. *Id.*

64. *Id.*

65. 253 F.3d 34, 59 (D.C. Cir. 2001).

66. *Id.* at 65–67.

Before applying its test, the panel observed that courts generally ought to be “very skeptical about claims that competition has been harmed by a dominant firm’s product design changes,” and that, in rapidly changing markets, skepticism was especially warranted.⁶⁷ On the other hand, it noted, skepticism about these kinds of claims should not amount to a per se rule of legality for all such changes.⁶⁸ The D.C. Circuit concluded that the proper approach would consist of a three-part test: first, the plaintiffs would need to show that the design changes in question resulted in anticompetitive effects; if they made such a showing, the defendants would then have to demonstrate that those changes produced procompetitive effects.⁶⁹ If the defendants did so, then the plaintiffs would bear the ultimate burden of demonstrating that the proven anticompetitive effects outweighed the proven procompetitive ones.⁷⁰

The application of that test in *Microsoft* was remarkably—and uncommonly, one might think—simple. For two of the challenged changes, Microsoft offered no procompetitive justification; and, for the third, plaintiff failed to rebut Microsoft’s procompetitive justification.⁷¹ Consequently, the court never reached the point where it needed to balance conflicting effects. One might imagine any number of plausible scenarios, however, in which the parties submit conflicting evidence as to the competitive effects of a dominant firm’s impugned invention. The D.C. Circuit offered no particulars as to how its balancing calculus would operate. Nor are the mechanics for applying such a test in any way obvious. The candidates for consideration—the short-term harms and long-term benefits, both qualitative and quantitative, occasioned by an invention—are either incommensurable or incomparable, or both.⁷² Even if judges could articulate a logical framework within which to carry out this utilitarian calculation—which would itself be an heroic feat—it would be difficult, if not impossible, to guide juries through the test in a coherent way. That problem, in turn, might result in courts making decisions on the basis of their perceptions of the technical merits of the change in question.

Identifying the “merits” of a new technology, however, constitutes the single most intractable aspect of the law governing both anticompetitive

67. *Id.* at 64–65.

68. *Id.* at 65.

69. *Id.* at 58–59.

70. *Id.*

71. *Id.* at 66–67.

72. These factors are incommensurable because courts have little ability to determine the long-run impact of a new product design or other innovation on consumer welfare and thus cannot reliably include such considerations in a calculus to determine whether the net impact of a challenged invention is positive.

innovation generally, and the D.C. Circuit's balancing test specifically. The question whether a purported improvement is indeed what it claims to be is of inescapable importance to antitrust analysis, but its resolution is problematic. The principal difficulty is one of definition. In other words, do technological benefits, presumably as evidenced (and disputed) by expert testimony from scientists and engineers, control the fact and quality of invention? Or do consumer purchases—themselves potentially subject to distortion-inducing biases or bouts of irrationality—constitute the final word?

A second, closely related problem involves the source and nature of proof. Although competition law traditionally places heavy weight on consumer choice,⁷³ market processes may be imperfect indicators of consumer demand in a less-than-fully informed world.⁷⁴ By the same token, though, expert testimony about the intricacies of a particular technology may likewise produce inaccurate conclusions. Even if a “correct” answer exists as to the merits of a technological improvement, expert evidence may not be an effective guide to judicial decision making. Numerous studies have questioned the utility of expert testimony when the determination of truth lies with lay judges or jurors, who are prone to reach arbitrary conclusions in technologically complex cases.⁷⁵ In other contexts, the new product may display subjective qualities—such as its “look” or “feel”—that preclude universal, or objectively falsifiable, scientific conclusions as to whether the relevant change is desirable, neutral, or unwelcome. This might be most likely in cases of incremental changes in product design, which are ubiquitous in the modern economy.⁷⁶ In the absence of a verifiable answer to the question whether an innovation is beneficial, how can courts attempt to weigh its magnitude against an alleged harm to competition?

If the D.C. Circuit was indeed “very skeptical” of claims of predatory innovation,⁷⁷ its skepticism must have reflected the view that evidence of predation accompanying most allegations of anticompetitive innovation is unconvincing. Such a prediction, however, does nothing to aid analysis. Moreover, the standard that the D.C. Circuit devised took little account of the skeptical view upon which the court professed to base its analysis. If product design is almost invariably desirable and only in exceptional cases

73. See, e.g., *Nat'l Collegiate Athletic Ass'n v. Bd. of Regents of Univ. of Okla.*, 468 U.S. 85, 102 (1984).

74. See *infra* Section II.B.4.

75. See, e.g., Scott Brewer, *Scientific Expert Testimony and Intellectual Due Process*, 107 *YALE L.J.* 1535, 1539 (1998).

76. See, e.g., Michael J. Burstein, *Rules for Patents*, 52 *WM. & MARY L. REV.* 1747, 1769 (2011).

77. *United States v. Microsoft Corp.*, 253 F.3d 34, 65 (D.C. Cir. 2001).

predatory, as the D.C. Circuit implicitly recognized,⁷⁸ then the law should entertain antitrust claims founded on exclusionary innovation with a healthy dose of doubt. In fashioning a rule for addressing claims of predatory innovation, however, the court enunciated a standard free from ingrained or systemic bias against such claims.⁷⁹ Beyond putting the initial burden of proof on the plaintiff—an allocation common to all civil cases⁸⁰—the D.C. Circuit’s test created an analytic framework equally conducive to findings of legality and illegality.

This neutral approach is problematic. Courts in monopolization cases must rely on unquantifiable and probabilistic long-term effects. Since short-run anticompetitive effects are easier to assess and are more available, a neutral test will systematically overweigh them at the expense of a fair assessment of long-term benefits. Indeed, it is easier to demonstrate some “harm” to competition in the short-run, static sense than it is to disprove anticompetitive consequences by appealing to economic theory governing dynamic effects.⁸¹

3. *The Federal Circuit’s Illogical Approach: Establishing Predatory Innovation Through Intent*

The single most ill-conceived treatment of predatory innovation arose in the 1998 case *C.R. Bard, Inc. v. M3 Systems, Inc.*⁸² In response to a patent infringement lawsuit brought against it, the defendant, M3 Systems, filed an antitrust counterclaim asserting that the plaintiff, C.R. Bard, had modified its patented product specifically to render it incompatible with competitors’ complementary parts.⁸³

The patented good in question was Bard’s “Biopty gun”—a mechanical device for extracting human tissue samples—which went through three iterations.⁸⁴ The first version, which required the simultaneous efforts of two physicians to operate, fired a particular brand of biopsy needle, “Tru-Cut,” into the target tissue.⁸⁵ Three years later, the inventor sought to improve the

78. *Id.*

79. *Id.* at 58–59.

80. See, e.g., Amy Dieterich, *The Role of the State Attorney General in Preventing and Punishing Hate Crimes Through Civil Prosecution: Positive Experiences and Possible First Amendment Potboles*, 61 ME. L. REV. 521, 526 (2009).

81. For the authors’ larger discussion of this issue, see Michael Jacobs & Alan Devlin, *The Riddle Underlying Refusal-To-Deal Theory*, 105 NW. U. L. REV. 1 (2010).

82. 157 F.3d 1340 (Fed. Cir. 1998).

83. *Id.* at 1346.

84. *Id.* at 1346–48.

85. *Id.* at 1347.

operation of the gun by redesigning it so that users would not have “to cock the two drivers manually before installing the biopsy needles, a step described as awkward and inefficient.”⁸⁶ The second-generation gun entailed the use of a ring that allowed a single user to cock the drivers after he had placed the needles in the gun.⁸⁷ Since the Tru-Cut needles could not move both forward and backward, a feature supposedly necessary to the improved gun’s operation, they were incompatible with the second version.⁸⁸ The third, and final, iteration reduced the manual force needed to cock the driver springs through an external mechanism that energized the two springs separately. The inventor obtained additional improvement patents for both the second- and third-generation guns.⁸⁹ Bard subsequently acquired these intellectual property rights. M3, which Bard accused of infringing those patents, alleged that Bard had deliberately modified its biopsy gun so that it would not work with Tru-Cut needles.⁹⁰

A divided Federal Circuit upheld a jury verdict of attempted monopolization, based on evidence that the desire to exclude manufacturers of replacement needles motivated Bard to modify its gun.⁹¹ The majority articulated an intent-based test for evaluating the legality of a product-design change, holding that “M3 was required to prove that Bard made a change in its Biopsy gun for predatory reasons, i.e., for the purpose of injuring competitors in the replacement needle market, rather than to improve the operation of the gun.”⁹² The majority pointed to, among other things, two internal Bard documents that arguably suggested that the modifications were devoid of technological merit.⁹³ The obvious perversity underlying this standard is that it substitutes subjective intent for market-based analysis that would calculate the actual price and innovation effects of a challenged form of innovation.⁹⁴

The court’s holding invited a sharp dissent from Judge Newman. She opined:

Both the needle assembly alone and the integrated biopsy gun/needle device were patented. They were subject to Bard’s

86. *Id.*

87. *Id.*

88. *Id.* at 1376.

89. *Id.* at 1347–48.

90. *Id.* at 1369.

91. *Id.* at 1382.

92. *Id.*

93. *Id.*

94. *See, e.g.,* Ball Mem’l Hosp., Inc. v. Mutual Hosp. Ins., Inc., 784 F.2d 1325, 1339 (7th Cir. 1986) (“Vigorous competitors intend to harm rivals, to do all the business if they can. To penalize this intent is to penalize competition.”).

patent-based rights to exclude others from making, using, or selling them. It was not Bard's changes to its biopsy gun or needles that affected M3's sale of replacement needles; it was the patents on these products. To hold that Bard could violate the Sherman Act by changing these products, if M3's business was adversely affected, is a novel and pernicious theory of antitrust law that is contrary to the principles of competition, and fraught with litigation-generating mischief.

....

... It is without precedent to find antitrust liability premised on a theory that development of new products is illegally anticompetitive when the new product requires competing suppliers to adjust their product accordingly. . . . If this court deems it appropriate to add this burden to patent-based innovation, there should at least be some overriding public benefit. However, antitrust jurisprudence has well understood that the enforcement of the antitrust laws is self-defeating if it chills or stifles innovation.⁹⁵

Judge Newman's dissent reflects the consensus of opinion among antitrust scholars and judges well versed in antitrust law that the law is meant to protect competition, not competitors. Real innovation fosters competition—and is often the essence of competition—because it requires competitors of the innovating firm to invent and develop their own improvements if they wish to survive, a requirement that redounds strongly to the benefit of consumers.

As explained in more detail in the Section III.B, *infra*, subjective intent is often a red herring in antitrust analysis and ought to be irrelevant in these cases. Ultimately, the Federal Circuit's holding rested on a flimsy rationale. Beyond the criticisms articulated by Judge Newman and the court's imprudent focus on subjective intent, the challenged product design wrought no economic harm. By excluding M3's and other competitors' needles from use in operation with its gun, Bard integrated vertically. Although there are circumstances in which such integration can injure consumers,⁹⁶ the process is generally efficient, as it was in the case of *C.R. Bard*. Economic analysis demonstrates that vertical integration is desirable when the upstream manufacturer can supply downstream or complementary products or services

95. *C.R. Bard*, 157 F.3d at 1370–72 (Newman, J., dissenting) (citations omitted).

96. See Posner, *supra* note 37, at 240–41.

at a lower cost than third parties can supply such products.⁹⁷ By eliminating the Cournot-complements problem,⁹⁸ vertical integration can generate higher output and lower prices.⁹⁹ This benefit was lost on the majority, likely because it substituted “intent” for economic analysis.

4. *The Second Circuit’s Problematic Test: Consumer Preference as a Conclusive Determinant of Legality*

Even before the articulation of the tests described above, the Second Circuit had devised a test of its own in the well-known case of *Berkey Photo, Inc. v. Eastman Kodak Co.*¹⁰⁰ That litigation arose after Kodak—the then-dominant firm in markets for film, color-print paper, and cameras—introduced a new pocket camera along with a new film designed to produce clear-color prints from smaller negatives, but through a new photofinishing process that was incompatible with the process previously in use.¹⁰¹ The new products were popular with consumers, but Berkey, unaware of the pocket camera’s imminent introduction, could offer nothing to compete with Kodak for some months after the Kodak camera came to the market.¹⁰² This allegedly placed Berkey at a severe competitive disadvantage.¹⁰³ Among other claims, Berkey argued that the product introduction was predatory because the new film was not an improvement over existing kinds, and also because the combination of the new film and new photofinishing process was unnecessary to produce good photographs with the new camera.¹⁰⁴

Rejecting Berkey’s claims, the court first recited the well-accepted principle that as a general matter “any firm, even a monopolist, may . . . bring its products to market whenever and however it chooses.”¹⁰⁵ This did not mean, the court added, that new product introductions were immune from

97. See Herbert Hovenkamp, *Vertical Integration by the Newspaper Monopolist*, 69 IOWA L. REV. 451, 464 (1984); see also J. Gregory Sidak, *A Consumer-Welfare Approach to Network Neutrality Regulation of the Internet*, 2 J. COMPETITION L. & ECON. 349, 459 (2006).

98. A Cournot-complements problem arises when two separate entities have respective monopolies over two separate products that one must combine to create a final product. A negative externality afflicts the relevant pricing decisions because each owner fails to take into account the fact that decreasing the price of one complementary good would increase demand for the other product. If the two products come under common ownership, these effects will be internalized and efficient pricing decisions will result.

99. See, e.g., Randall Heeb, *Innovation and Vertical Integration in Complementary Markets*, 12 J. ECON. & MGMT. STRATEGY 387 (2003).

100. 603 F.2d 263 (2d Cir. 1979).

101. *Id.* at 267–71.

102. *Id.* at 269.

103. *Id.*

104. *Id.* at 283–86.

105. *Id.* at 286.

antitrust scrutiny, but rather that any antitrust violation must come not from “the product introduction itself, but [from] some associated conduct.”¹⁰⁶ The court then observed, in what seemed to be the distillation of its test, that “[i]f a monopolist’s [new] products gain acceptance in the market, . . . it is of no importance that a judge or jury may later regard them as inferior, so long as that success was not based on any form of coercion.”¹⁰⁷ As it could find no evidence that Kodak had coerced consumers into purchasing the new camera system, the court held that the product introduction was not anticompetitive.¹⁰⁸

The Second Circuit’s approach is a consumer-preference test with a twist. If consumers like the new product—regardless of its technical merits (i.e., whether and how much it represents an improvement)—then there is no predation. If they dislike the new product, then it makes no difference whether the product is “predatory,” since rivals have suffered no harm on account of its introduction and therefore lack standing to sue. This test puts primacy of place on consumer autonomy, allowing individual purchasers to effectively determine legality by signaling their preferences through the market. It evaluates the “quality” of an improvement democratically, by resort to a consumer referendum, without regard to technical proof of the scientific merit underlying the new product. One might say that the consumer-preference test reflects a libertarian perspective, even allowing people irrationally to elect technologically inferior products or higher-priced goods that are not “truly” innovative. This perspective would decline to deploy antitrust, or any other body of law, to prevent any firm, even a dominant one, from marketing goods that consumers desire but would shun if they knew better.

The twist—common perhaps to *Tyco*, *Microsoft*, and *Berkey*—lies in the concept of “coercion.” As a general matter, this qualification makes eminent sense because consumers cannot demonstrate their relative tastes for a new product when a company deprives them of choice. Thus, by its own terms, the consumer-preference test would seem inapplicable to cases in which a dominant company’s allegedly predatory improvement prevents any third party from marketing a rival product. An ordinal ranking of products in a market that consists of a single good does not convey any useful information as to the qualitative characteristics of that product. Simply put, consumer preference cannot emerge when the consumer’s choice is a take-it-or-leave-it proposition.

106. *Id.* at 286 n.30.

107. *Id.* at 287.

108. *Id.* at 287–88.

While this is an important limitation on the Second Circuit's test, its meaning is inevitably unclear. The concept of "coercion" encapsulates restrictions of varying severity. When strategic marketing of new goods precludes the availability of substitutes, as in certain instances of product hopping discussed in Part V, *infra*, "coercion" clearly exists. Yet, an allegedly improved product, introduced by a dominant firm, may enjoy scale, marketing, network effects, and other benefits independent of technological merit that partially constrain consumer choice. Where market processes are corrupted, but not entirely inoperative, consumer purchases, though indicative, may be a misleading guide to the technological merits of the challenged product. Indeed, in its purest form, the "coercion" limb of the consumer-choice test might regard any material advantage enjoyed by the seller of the "improved" product as capable of corrupting consumer choice and thus undermining the signaling value of market sales. In short, because consumer free will is an abstraction, the *Berkey* test, though linguistically pleasing, is both incomplete and problematic in practice.

C. MEASURING THE QUALITY OF INVENTION

The preceding cases illustrate a panoply of difficult legal issues implicated by antitrust oversight of technological advancement. The chief problem involves measuring the quality of an assailed invention. After all, if courts *ex post* and companies *ex ante* could both reliably and cheaply determine which claimed improvements are illusory, no policy dilemma would accompany claims of predatory innovation. Unfortunately, a variety of constraints prevent such a felicitous outcome. In light of courts' fact-finding limitations and inventors' imperfect ability to predict judicial conclusions about the legality of their behavior, how should antitrust law treat claims of innovation-based monopolization?

The decisions discussed above demonstrate how the courts have thus far answered this question. Those decisions reflect contrasting levels of confidence in the judiciary's self-assessed ability to conduct antitrust oversight of technology in a reliable and effective manner. Given the serious practical constraints on judges' and juries' capacity for determining the scientific or engineering merit of an assailed innovation *ex post*, the Second Circuit favors treating consumer demand for an improved product, absent coercion, as conclusive evidence of quality.¹⁰⁹ Similarly skeptical about its ability to quantify the significance of a purported improvement, the Ninth Circuit deems a finding of *some* advance to be inconsistent with an antitrust

109. *Id.*

violation.¹¹⁰ Uniquely sanguine about its ability to engage in an invention-specific, utilitarian cost-benefit analysis, the D.C. Circuit advocates a balancing test that weighs the magnitude of an improvement against its exclusionary effect.¹¹¹ Whether its faith is justified is an open matter, for—it bears emphasizing—the court did not even have occasion to apply the rule that it championed. Furthermore, in the Federal Circuit, the quality of a purported improvement is irrelevant: real innovation “intended” to harm rivals is subject to condemnation even when it is socially beneficial.¹¹²

In our view, antitrust oversight of innovation is fraught with danger. The pace and complexity of technological advancement in the new economy far exceed the capabilities of the judicial process to identify and assess bona fide invention accurately. The principal problems with competition law’s review of dominant-firm innovation are three-fold. First, the glacial pace of litigation renders antitrust enforcement largely ineffective in constraining even genuine acts of predatory innovation.¹¹³ Monopolization cases invariably span many years, during which time scientific progress may well have rendered the technology at issue obsolete.¹¹⁴ Even putting error costs aside, the expense of prosecuting and defending antitrust cases is hard to justify when the real effect of such enforcement actions is irrelevant.

Second, assuming that the impugned invention remains commercially significant upon resolution of antitrust proceedings, the limited remedies available to a court preclude effective correction of distorted market conditions.¹¹⁵ Prior monopolization cases make competition law’s remedial deficiencies painfully apparent, revealing that antitrust remedies are no

110. *Allied Orthopedic Appliances, Inc. v. Tyco Health Care Grp.*, 592 F.3d 991, 998–99 (9th Cir. 2010).

111. *United States v. Microsoft Corp.*, 253 F.3d 34, 58–59 (D.C. Cir. 2001).

112. *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1382 (Fed. Cir. 1998).

113. See, e.g., Lee Goldman, *Oligopoly Policy and the Ethyl Corp. Case*, 65 OR. L. REV. 73, 93–94 (1986); see also Dan G. Barry, Comment, *The Effect of Video Franchising Reform on Net Neutrality: Does the Beginning of IP Convergence Mean That It Is Time for Net Neutrality Regulation?*, 24 SANTA CLARA COMPUTER & HIGH TECH. L.J. 421, 436 (2008).

114. See, e.g., David J. Teece & Mary Coleman, *The Meaning of Monopoly: Antitrust Analysis in High-Technology Industries*, 43 ANTITRUST BULL. 801 (1998); see also Mika Kato, *Transitoriness of Market Power and Antitrust Activity*, 6 J. COMPETITION L. & ECON. 393, 395–96 (2010). But see Michael A. Carrier, *Pictures at the New Economy Exhibition: Why the Antitrust Modernization Commission Got It (Mostly) Right*, 38 RUTGERS L.J. 473, 475 (2007).

115. See, e.g., Jonathan B. Baker, *Preserving a Political Bargain: The Political Economy of the Non-interventionist Challenge to Monopolization Enforcement*, 76 ANTITRUST L.J. 605, 617 (2010) (summarizing the Chicago School view as to why monopolization enforcement is likely to be ineffective and counterproductive); Einer Elhauge, *Disgorgement as an Antitrust Remedy*, 76 ANTITRUST L.J. 79, 87 (2009); John E. Lopatka, *Assessing Microsoft from a Distance*, 75 ANTITRUST L.J. 811, 813–14 (2009).

substitute for free-market forces generally, and third-party innovation in particular.¹¹⁶ By far the most prominent new-economy antitrust case against predatory innovation was *Microsoft*.¹¹⁷ That litigation spanned nearly a decade,¹¹⁸ and despite a harsh consent decree that imposed certain interoperability requirements and otherwise sought to dilute the operating system monopoly, economists regard the remedies as an abject failure.¹¹⁹ The consent decree came to a close in 2011 without much notice.¹²⁰

Crucially, technology-based competition from Google and Apple, among others, has eviscerated Microsoft's dominance, which was commonly supposed to be unassailable only a few years before.¹²¹ A recent feature in *The Economist* observed that Microsoft's future looks uniquely vulnerable vis-à-vis those of its closest rivals.¹²² Perhaps most remarkably, the company has recently joined the chorus of self-proclaimed victims of anticompetitive practices, adding its voice to those criticizing the new successful innovator on the block, Google.¹²³ This is itself a stunning indictment of the antitrust system, revealing its proclivity to become a vehicle for failing competitors to seek recourse through competition laws.

Third and most importantly, ex post judicial scrutiny of innovation is an inexact science that defies reliable application.¹²⁴ Courts faced with a challenge to a new product must answer four very difficult questions: Has there been an "innovation" to the relevant product, or simply a "change"? If there has been an innovation, how significant must it be, on a scale ranging

116. See Lopatka, *supra* note 115, at 813–14.

117. See discussion *supra* Section II.B.2.

118. Christian Ahlborn & David S. Evans, *The Microsoft Judgment and Its Implications for Competition Policy Towards Dominant Firms in Europe*, 75 ANTITRUST L.J. 887, 888 (2009).

119. See Robert W. Crandall & Charles L. Jackson, *Antitrust in High-Tech Industries*, TECH. POL'Y INST. (Dec. 2010), http://techpolicyinstitute.org/files/crandalljackson%20antitrust_in_high_tech3.pdf.

120. See, e.g., Bianca Bosker, *Microsoft's Antitrust Saga Finally Comes to an End*, HUFFINGTON POST (May 25, 2011), http://www.huffingtonpost.com/2011/05/12/microsofts-antitrust-saga_n_861281.html; Jay Greene, *Microsoft Oversight Ends with Little To Show for Effort*, CNET NEWS (May 12, 2011), http://news.cnet.com/8301-10805_3-20062079-75.html.

121. See Robert Cyran & Martin Hutchinson, *At Microsoft, Bing Too Costly To Keep*, N.Y. TIMES, July 25, 2011, at B2; Elizabeth Flock & Hayley Tsukayama, *Apple Announces Free iCloud Service*, WASH. POST, June 7, 2011, at A10; Opinion, *Remember Microsoft?*, N.Y. TIMES, June 11, 2011, at A20; Martin Peers, *A Window into Microsoft's Profit Outlook*, WALL ST. J., Mar. 20, 2010, at B16; Seth Schiesel, *Game Changer*, N.Y. TIMES, June 9, 2011, at F1.

122. *Microsoft: Middle-Aged Blues*, ECONOMIST, June 13, 2011, at 12; see also *IBM: 1100100 and Counting*, ECONOMIST, June 13, 2011, at 11.

123. See Steve Lohr, *Antitrust Cry from Microsoft*, N.Y. TIMES, Mar. 31, 2011, at B1.

124. See, e.g., Marina Lao, *Reclaiming a Role for Intent Evidence in Monopolization Analysis*, 54 AM. U. L. REV. 151, 179–86 (2004).

from “trivial” to “transformative”? Once the criteria for measuring the magnitude of an innovation have been settled, how should they be assessed and by whom? And, finally, how are the benefits of the innovation to be compared with its harm to competition? In grappling with these questions, judges and juries are likely to err regularly. The price of false positives—erroneous findings that a social-welfare-increasing act of invention was welfare-decreasing—is likely to be severe.¹²⁵ Given the overriding importance of innovation to the economy, legal standards that threaten to punish a dominant firm for introducing new technology can have damaging repercussions.¹²⁶

Nor are such problems unique to mistaken factual determinations. Improperly calibrated antitrust standards that leave inventors uncertain about the probable legality of their actions can depress innovative activity *ex ante*. The second-order effects of mistaken antitrust analysis of exclusionary invention are serious. Yet, total deference to the marketing of dominant firms’ self-proclaimed improvements, with no antitrust enforcement, could conceivably foreclose channels for follow-on innovation, thus denying consumers competing sources of technological development and commercialization.

These three features at the intersection between antitrust and innovation demonstrate the dangers attendant upon applying the former to the latter. The following two Parts articulate our view on the optimal antitrust rules governing claims of technology-based predation. Part V then applies this proposed framework to what many consider to be the single most blatant act of predatory innovation, “product hopping” in the pharmaceutical industry. Contrary to prevailing academic opinion, we conclude that strategic manipulation of the pharmaceutical regulatory structure generally lies outside of antitrust law’s remit. We thus urge, for the most part, a regulatory or legislative solution to the problem in lieu of a judicial one. Only where a hop successfully forecloses entry should antitrust law intervene.

III. AN ANALYTIC FRAMEWORK FOR ADDRESSING CLAIMS OF PREDATORY INNOVATION

As the preceding discussion explained, in assessing claims of predatory innovation, the courts have adopted inconsistent and inadequate rules for

125. See, e.g., Geoffrey A. Manne & Joshua D. Wright, *Google and the Limits of Antitrust: The Case Against the Case Against Google*, 34 HARV. J.L. & PUB. POL’Y 171, 182–84 (2011).

126. See, e.g., *id.*

analyzing the fact and extent of innovation by the dominant firm and for determining the competitive effects of such innovation.

This Part identifies three factors that the law should ignore, even though they may appear to shed light on the question of whether a product design is predatory. The first factor would regard the PTO's decision to grant a patent over a claimed product or process as conclusive proof that the patented technology represents an improvement over the prior art. The second would use evidence of a defendant's intent to exclude a rival as a proxy for the lack of technological merit in the assailed invention. And the third would equate the presence of "coercion" with consumer harm and find an antitrust violation on that basis. Far from being helpful guides to analysis, these factors are rarely relevant, and often misleading, when applied to claims of alleged monopolization by innovation.

A. THE PTO

Should it be a complete defense for a company accused of predatory innovation that it possesses a patent over the challenged product design? This question implicates two distinct and important considerations. The first is whether the fact of patent issuance demonstrates a threshold level of qualitative improvement over the prior art. If it does, the consequences would be significant. In those jurisdictions that reject the possibility of an antitrust violation if the assailed product offers some genuine improvement—namely, the Ninth and Second Circuits¹²⁷—the fact of patent protection would dispose of claims of predatory innovation. For jurisdictions that weigh the benefits of an invention against its costs to competition—specifically, the D.C. Circuit¹²⁸—patent protection would be relevant to the net-welfare calculus. The second consideration is whether a patent necessarily precludes any role for antitrust analysis. If a patent amounts to a lawful monopoly, does it protect a dominant company from liability for any form of product-design-based exclusion?

Many might suppose that the issuance of a patent by the PTO conclusively disposes of the question of technological merit. An expert agency's decision to grant a twenty-year exclusive right over a new, useful, and nonobvious invention surely reflects a determination of scientific achievement worthy of deference.¹²⁹ A patent alone, however, is a poor proxy for the existence and magnitude of any innovation that may underlie a

127. *See supra* Sections II.B.1, II.B.4

128. *See supra* Section II.B.2.

129. *See* 35 U.S.C. §§ 101–103 (2010).

claimed invention.¹³⁰ To satisfy the utility requirement for patent issuance, an inventor need not establish that the claimed product or process is superior to the prior art; he need demonstrate only that it is operable to achieve a useful result.¹³¹ The same holds true for so-called “improvement patents,” which provide precious-little signaling value regarding the relevant qualitative enhancement incorporated within their claims.¹³² To obtain such a patent, an inventor need only convince the PTO that the “improved” technology operates differently from the “basic” product or process.¹³³ For these reasons, courts should decline to presume that the existence of a patent over new technology marks that technology as inventive.

This does not mean of course that patented products or processes typically fail to advance the prior art. Some, perhaps many, entail significant improvements over the prior art. The point is that patent applications present the PTO with a spectrum of patentable inventions. At one end of the spectrum is what one might describe as an illusory act of invention, and at the other is the first wheel. In between lies a wide variety of qualitative improvements, some of which may be slight but valuable (for example, certain reformulations of drugs).

This observation leads to the second question, which is whether the fact of patent protection should shield all inventions from antitrust scrutiny, including those that lie at the “illusory” end of the spectrum. This question is complicated by the fact that the PTO may be simultaneously correct as a matter of patent law, as the invention satisfies the novelty and utility requirements, and incorrect as a matter of antitrust law, because it entails no material technological improvement and injures consumer welfare. Can antitrust laws correct, or disregard, a “mistaken” finding by the PTO, which enables a dominant firm to harm competition? This question implicates issues of comparative institutional competence, deference between conflicting fields of substantive law, and practical administration.

130. See, e.g., Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 1007 n.78 (1997) (observing that “[t]he requirement that a patented invention be ‘useful’ is only laxly enforced” such that it is “possible to obtain a patent on a nonobvious but inefficient (relative to the prior art) way of doing things”).

131. *In re Swartz*, 232 F.3d 862, 863 (Fed. Cir. 2000).

132. See, e.g., Lemley, *supra* note 130, at 1007.

133. See 35 U.S.C. § 101 (allowing the inventor of “any new and useful improvement” to obtain a patent).

Taking the deference issue first, few question the sanctity of the patentee's right to exclude.¹³⁴ It is well established that patents are an "exception to the general rule against monopolies and to the right to access to a free and open market."¹³⁵ The antitrust laws generally have no application to a monopoly falling within intellectual property's sphere of exclusivity.¹³⁶ One might therefore conclude that a patent-covered invention, even one that represents no technological gain over the prior art, should enjoy absolute antitrust liability.¹³⁷ An argument in its favor might go as follows: If Congress saw fit to implement a patent system that grants a lawful monopoly to owners of inventions meeting certain statutory criteria, then a particular company's satisfaction of those criteria comports with patent law, and by extension, antitrust. Thus, if the PTO saw fit to bestow a patent on the relevant product's strategic alteration, the problem lies with the intellectual property laws and does not lend itself to an antitrust solution. A rule of per se legality, so justified, would also make sense from an administrative perspective because it would be simple to apply.

We disagree with this position. If a new product design represents a bona fide improvement, antitrust would and should welcome its introduction. But if a new design does not constitute an improvement over the replaced version and enjoys intellectual property protection, the patent might allow an anticompetitive use that would otherwise (with no patent) be impermissible. If the PTO is not determining utility, or if "utility" and "improvement" differ, then there seems to be no reason to defer to the PTO on the issue of "innovation."¹³⁸

Refusing to deem a patent conclusive of a new product's legality under the antitrust laws does no violence to the sanctity of the intellectual property system. A patent constitutes a form of property, which confers on its owner certain rights. As is invariably the case in law, however, those rights are not

134. *See, e.g.*, *Intergraph Corp. v. Intel Corp.*, 195 F.3d 1346, 1362 (Fed. Cir. 1999) (holding that "the antitrust laws do not negate the patentee's right to exclude others from patent property").

135. *Walker Process Equip., Inc. v. Food Mach. & Chem. Corp.*, 382 U.S. 172, 177 (1965) (quoting *Precision Instrument Mfg. Co. v. Auto. Maint. Mach. Co.*, 324 U.S. 806, 816 (1945)).

136. *See Simpson v. United Oil Co. of Cal.*, 377 U.S. 13, 24 (1964) (finding that "the patent laws . . . are in pari materia with the antitrust laws and modify them pro tanto").

137. *See, e.g.*, *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1370–72 (Fed. Cir. 1998) (Newman, J., dissenting).

138. Christopher R. Leslie, *Antitrust and Patent Law as Component Parts of Innovation Policy*, 34 J. CORP. L. 1259, 1285 (2009) ("Because patent holders may engage in conduct that improperly suppresses innovation, and patent law does not sufficiently constrain such behavior, decision makers who care about innovation should move toward antitrust.").

absolute but are rather contingent and qualified. A well-known set of antitrust limitations on a patentee's right to employ its property exists. These include so-called *Walker Process* fraud, in which patent applicants purposefully withhold information from the PTO that would preclude patentability;¹³⁹ patent-infringement proceedings where the patentee brings an objectively meritless lawsuit to enforce a patent that he knows to be invalid;¹⁴⁰ and the acquisition of patents from third parties to create an economic monopoly.¹⁴¹ These limitations are consistent with patents' status as property, and the courts have acknowledged them. Representatively, the D.C. Circuit in *Microsoft* characterized as near "frivolous" the defendant's argument that it could not violate the Sherman Act by employing its lawfully granted property as it saw fit.¹⁴² The court likened an inventor's possession of intellectual property to a person's wielding a baseball bat, pointing out that the latter would hardly enjoy immunity in using his property to attack a third party.¹⁴³

Thus, in the context of predatory innovation, the ease of substituting one patent-protected good for another of immaterial technological distinction is such that the existence of intellectual property should not in itself foreclose an antitrust claim. To recognize an exemption from competition law in this instance would be improperly to confer a de facto right strategically to exclude equally or more efficient competitors under the guise of patent protection. As explained below, however, the circumstances in which the law should recognize a Sherman Act violation for exclusionary product design or other innovation are quite narrow. Specifically, where the relevant act of innovation does not prevent competitors' making their goods available to consumers, an antitrust claim of predatory invention should necessarily fail. Where a challenged product design actually forecloses rivals from the market, no antitrust violation should exist if the product entails a material improvement over the prior version. In determining whether such a material advance exists, the existence of a patent is by itself, not illuminative.

139. *Walker Process*, 382 U.S. 172.

140. See, e.g., Deborah A. Coleman, *Antitrust Issues in the Litigation and Settlement of Infringement Claims*, 37 AKRON L. REV. 263, 273 (2004).

141. See, e.g., *United States v. Lever Bros. Co.*, 216 F. Supp. 887, 889 (S.D.N.Y. 1963). See generally John L. Murchison, *Patent Acquisitions and the Antitrust Laws*, 45 TEX. L. REV. 663 (1967).

142. *United States v. Microsoft Corp.*, 253 F.3d 34, 63 (D.C. Cir. 2001).

143. *Id.* The accuracy of the court's analogy is questionable, given the many material differences between the economic principles that justify the recognition of rights in physical and intellectual property, respectively. Nevertheless, the D.C. Circuit was correct to reject the dogmatic view that antitrust imposes no constraint on the manner in which a patentee may exercise its exclusive rights.

B. INTENT

In *Microsoft*, the software giant conducted an all-out assault on Netscape's share of the Internet-browsing market with the self-described purpose of destroying its competitor.¹⁴⁴ In *C.R. Bard*, internal company documents revealed that the defendant had purposefully designed its biopsy gun to be incompatible with its rivals' needles, thus ensuring that complementary market for itself.¹⁴⁵ *Berkey* involved much-the-same circumstances as *C.R. Bard*, differing only in that the monopolized activity was photofinishing.¹⁴⁶ In *Tyco*, the defendant developed new medical sensors and monitors of limited technological improvement over the prior versions, presumably to prolong its period of dominance.¹⁴⁷

In all of these cases, one need hardly be cynical to infer a selfish intent on the part of the innovating companies. Might such intent itself be "predatory," and therefore relevant to the legality of the challenged invention? Surely, the law should distinguish technological innovation that harms rivals as an indirect result of higher consumer demand for a superior product from strategic "improvements" that have as their explicit goal the destruction of competitors?¹⁴⁸ To grant dominant companies carte blanche strategically to market whatever kinds of insignificant improvements they choose is, from this perspective, to invite anticompetitive outcomes.

One might thus be tempted to summarily condemn predatory innovation of the kind described above. Monopolists' attempts to prolong or perpetuate their dominant position invariably run counter to short-term (static) competition and hence, one might suppose, undermine consumer welfare. Indeed, their efforts may operate in diametric opposition not only to antitrust's consumer-focused ideology, but also, in certain industries, to the goals of a relevant regulatory infrastructure intended to foster entry and lower prices.

Yet, identifying the optimal legal rules for assessing claims of exclusionary innovation is a far more complex matter than simply discerning the purpose behind a product-design change. Evidence of subjective

144. *Id.* at 76–77.

145. *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1382 (Fed. Cir. 1998).

146. *Berkey Photo, Inc. v. Eastman Kodak Co.*, 603 F.2d 263, 287 (2d Cir. 1979).

147. *Allied Orthopedic Appliances, Inc. v. Tyco Health Care Grp.*, 592 F.3d 991, 994–95 (9th Cir. 2010).

148. For a representative argument in favor of using evidence of subjective intent in monopolization cases in the intellectual property context, see W. Michael Schuster, Comment, *Subjective Intent in the Determination of Antitrust Violations by Patent Holders*, 49 S. TEX. L. REV. 507, 530–34 (2007); see also Lao, *supra* note 124.

predatory intent ought not to bear on the antitrust treatment of predatory invention.¹⁴⁹ Taking a view contrary to EU competition rules,¹⁵⁰ and some U.S. decisions,¹⁵¹ we believe that formal economic analysis alone should provide the pertinent rule of decision in this area. A desire to quash one's rivals is endemic, and proper, in competitive markets.¹⁵²

Economists widely assume that companies act to maximize profit¹⁵³—a subjective aim that entirely subsumes intent to eliminate one's competitors. Such intent is equally consistent with merit-based and exclusionary acts of competition and therefore provides no help in distinguishing the two. Indeed, judicial reliance on corporate “intention” is likely to be especially unreliable, as it may be tempting to regard expressions of nefarious intent as the evidentiary equivalents of outcomes predicted by rigorous economic analysis. Whether a particular innovation is laudable or predatory turns on an economic examination into whether the challenged conduct is welfare enhancing. Since evidence of a company's desire to see its rivals fail is not pertinent to this calculus, it ought to be irrelevant to the analysis of a monopolization case founded on an alleged act of predatory innovation. Judge Easterbrook's pointed exposition of the limits of “intent”-based analysis in monopolization cases is particularly appropriate here:

[I]ntent plays no useful role in this kind of litigation. Firms “intend” to do all the business they can, to crush their rivals if they can. “[I]ntent to harm” without more offers too vague a standard in a world where executives may think no further than “Let's get more business.” Rivalry is harsh, and consumers gain the most when firms slash costs to the bone and pare price down to cost, all in pursuit of more business. Few firms cut price unaware of what they are doing; price reductions are carried out in pursuit of sales, at others' expense. Entrepreneurs who work hardest to cut their

149. *Accord* PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 775c, at 233 (1996) (“Because courts and juries are generally incapable of addressing the technical merits or anticompetitive effects of innovation, they quickly make the relevant question turn on intent. We believe this is the worst way to handle claims that innovation violates the antitrust laws.”). *But see* Ronald A. Cass & Keith N. Hylton, *Antitrust Intent*, 74 S. CAL. L. REV. 657 (2001) (defending a limited role for intent in antitrust cases).

150. *See, e.g.*, Pierre V.F. Bos, *International Scrutiny of Payment Card Systems*, 73 ANTITRUST L.J. 739, 767 n.113 (2006).

151. *See, e.g.*, *Image Technical Servs., Inc. v. Eastman Kodak Co.*, 125 F.3d 1195, 1208–09 (9th Cir. 1997); *see also* *Cal. Dental Ass'n v. Fed. Trade Comm'n*, 224 F.3d 942, 948 (9th Cir. 2000).

152. *See* *Illinois ex rel. Burris v. Panhandle E. Pipe Line Co.*, 935 F.2d 1469, 1481–82 (7th Cir. 1991).

153. *See, e.g.*, Herbert Hovenkamp, *Positivism in Law & Economics*, 78 CALIF. L. REV. 815, 830–31 (1990).

prices will do the most damage to their rivals, and they will see good in it. You cannot be a sensible business executive without understanding the link among prices, your firm's success, and other firms' distress. If courts use the vigorous, nasty pursuit of sales as evidence of a forbidden "intent," they run the risk of penalizing the motive forces of competition.¹⁵⁴

If evidence of a company's desire to injure its rivals is as illuminative of consumer-benefitting competition as it is of nefarious exclusion, then courts should eschew such evidence in favor of price-theoretic analysis that seeks to establish the actual market impact of a challenged practice.

C. COERCION

If intent is irrelevant, and the fact that the PTO issued a patent casts little light on the quality of a challenged invention, what other factors should inform antitrust analysis? Might the presence or absence of coercion play an integral role in determining the legality of a challenged innovation? As the cases explored above demonstrate, this factor has formed a focal point of analysis for judicial review of predatory product introductions.

The concept of coercion has intuitive appeal.¹⁵⁵ Few question the difficulty of formulating a reliable judicial method for detecting, let alone quantifying, technological superiority. However, in a market-based economy and a society that puts great weight on individual autonomy, there is at least some consensus that the law should defer to consumers' purchasing decisions, which signal their collective preference for a purportedly improved product.¹⁵⁶ Yet, faith in the market's ability to distinguish high- from low-quality products evaporates when consumers' freedom to choose one product over another is compromised. In cases of perceived coercion, the law ought to be skeptical of claimed improvement. Should deprivation or reduction of consumer choice assume a central place in antitrust analysis of predatory invention?

154. See *A.A. Poultry Farms, Inc. v. Rose Acre Farms, Inc.*, 881 F.2d 1396, 1401–02 (7th Cir. 1989) (citations omitted).

155. See generally Mark R. Patterson, *Coercion, Deception, and Other Demand-Increasing Practices in Antitrust Law*, 66 ANTITRUST L.J. 1 (1997).

156. See Barak Y. Orbach, *The Antitrust Consumer Welfare Paradox*, 7 J. COMPETITION L. & ECON. 133, 156 (2011) (“[C]onsumers’ revealed preferences . . . may be unwise, they may undermine their own well-being and reduce social welfare, but antitrust laws do not offer relevant preference-shaping mechanisms to address the issue.”); see also Mark D. Whitener, Editor’s Note, *change.gov*, ANTITRUST, Summer 2009, at 4 (quoting Deputy Assistant Attorney General for Economics Carl Shapiro to the effect that antitrust “is not about steering the market in any particular direction other than the direction indicated by consumer preferences”).

The answer is no. In the first place, the term “coercion” is unfortunate, since it carries subjective and pejorative connotations, which, like “predatory intent,” courts can use to substitute conclusions for analysis. It is, in addition, a term with a broad range of possible meanings, at once ambiguous and opaque. Tying law,¹⁵⁷ for example, uses the term to some disadvantage, though in that context it seems to mean that a dominant firm is forcing consumers to buy something that they would rather not purchase at all or that they would prefer to purchase elsewhere,¹⁵⁸ though its meaning in that context is far from crystal clear.

The term is even more ambiguous with respect to exclusionary product design. In this area, no workable definition of coercion has emerged. Does a company necessarily “coerce” its customers into purchasing the new version of an established product if it withdraws the prior variant of that good? Some might say so, though we think the answer is no. If it were otherwise, the law would place a major impediment on dominant companies’ commercialization of improved products. It will not necessarily be economically sensible for a dominant firm to maintain parallel product lines. For example, the costs of keeping two different inventories and of training service personnel to maintain separate products might be prohibitive. It makes no sense for the law to require a dominant firm to keep all of its products on offer forever in order to avoid a finding of “coercion.”

Could coercion instead arise from the absence of competition? In a certain sense, strained perhaps, consumers in a pure monopoly market are forced to take the monopolist’s product or leave it. Is that limited choice “coercive”? Perhaps, though such a definition would strain the concept of consumer autonomy. Buyers always retain the freedom not to purchase a product at all, regardless of whether it is sold under conditions of monopoly or competition, unless perhaps the relevant good is in some respect essential.

Moreover, even if consensus could somehow emerge around a definition of the term, what degree of coercion should suffice to prevent a court from relying conclusively on consumer demand for a challenged product design as evidence of its legitimacy? This question is especially problematic, for the

157. Product tying occurs when a seller conditions the sale of a product or service (“tying product”) on the purchase of a second product or service (“tied product”). The law has traditionally taken a dim view of product tying on account of the perceived fact that the practice (1) deprives consumers freedom of choice, (2) enables the purveyor of the tying product to leverage its dominance into the tied market, and (3) creates barriers to entry. *See, e.g.,* Jefferson Parish Hosp. Dist. No. 2 v. Hyde, 466 U.S. 2, 12 (1984), *abrogated by* Ill. Tool Works, Inc., v. Indep. Ink, Inc., 547 U.S. 28 (2006).

158. *See, e.g.,* Cheryl J. From, Comment, *Is There a Perfect Solution? The Court’s Problems in Applying Antitrust Laws to Bundled Discounts*, 7 DEPAUL BUS. & COM. L.J. 145, 153–54 (2008).

concept of coercion does not lend itself to an effective limiting principle, nor are degrees of coercion self-evident. Market imperfections are ubiquitous.¹⁵⁹ Even in competitive industries, companies' relative market shares, marketing strategies, brand names, first-mover advantage, scale and scope efficiencies, and sheer luck can affect consumer demand for a product, and thus compromise the signaling value of the market as a neutral arbiter of quality. Systemic advantages and disadvantages alike complicate the significance of relative consumer demand. Some take the position that many limitations on consumer freedom are compatible with an absence of coercion, and we agree.¹⁶⁰ But impediments beyond the preceding examples can arise, which introduce an unwelcome degree of subjectivity in determining whether consumer choice has been sufficiently compromised.

For instance, companies enjoying collective, or individual, control over innovation platforms may be able to influence the path of third-party product development, in some instances creating a bottleneck that permits them to dictate the nature and qualities of goods filtering down to consumers. Illustratively, some have criticized what they perceive to be inadequate competition between carriers in the wireless industry (AT&T, Verizon, Sprint, and T-Mobile), which allegedly enables those companies to exercise significant control over product design in the wireless equipment and applications markets.¹⁶¹ Should the fact of high consumer demand for existing products and services satisfy policymakers that excluded devices and applications are of no concern to the antitrust laws? Because such questions are divisive, academics, judges, and enforcers are unlikely to reach common accord on the definition of "coercion" as an element of predatory-innovation analysis.

In sum, when addressing claims of anticompetitive innovation, courts should refrain from relying on the concepts of intent or coercion. Furthermore, courts should decline to infer the existence of an improvement from the fact that a patent covers the relevant product. Finally, although it is well established that a patent bestows a right to exclude, there is no reason in principle why this fact should in itself shield a patentee from any antitrust liability. If a product redesign entails no material benefit over a prior version and carries anticompetitive effect, the presence of a patent over the redesigned product should not foreclose the possibility of an antitrust violation.

159. See RICHARD A. POSNER, *OVERCOMING LAW* 428 (1996).

160. See, e.g., *Burns v. Cover Studios, Inc.*, 818 F. Supp. 888, 893 (W.D. Pa. 1993) ("The psychojurisprudence of coercion has no relevance in the field of antitrust law.").

161. See, e.g., Tim Wu, *Wireless Carterfone*, 1 INT'L J. COMM. 389 (2007); see also Amol Sharma, *Telecoms Face Antitrust Threat*, WALL ST. J. (July 7, 2009), <http://online.wsj.com/article/SB124689740762401297.html>.

IV. THE CONTOURS OF AN EFFECTIVE SOLUTION

This Article has explained thus far that each test espoused by the U.S. courts of appeals is unsatisfactory and that optimal antitrust analysis of innovation would decline to consider both coercion and evidence of predatory intent. It would also refuse to draw an inference of technological merit based on patent protection alone. This Part outlines the contours of a better approach.

A. CHARACTERISTICS OF A SUPERIOR ANTITRUST STANDARD

To successfully resolve the problems implicated by antitrust oversight of innovation, one must adhere to a number of foundational principles. First, because overriding social benefits accompany the commercialization of invention,¹⁶² the law should endeavor to promote new products. In this respect, antitrust oversight is an important element in a larger innovation policy.

Second, it is possible for companies strategically to manipulate market processes through purported acts of invention and thus wrongfully to exclude equally or more-efficient competitors. For that reason, an effective competition policy may facilitate greater levels of long-run consumer welfare by fostering an environment conducive to merit-based competition and innovation, and by constraining illusory acts of invention likely to have exclusionary effects. Conversely, an improperly applied antitrust policy may be extraordinarily harmful if it depresses the rate of innovative activity in the economy.

Third, if the judicial process were error-free and if absolute legal certainty prevailed, the optimal antitrust standard would be unequivocal, taking the form of a simple utilitarian calculus that weighed the social benefits of a particular invention against the relevant exclusionary effects. In a hypothetical world in which courts never erred and companies could conclusively determine *ex ante* the legality of their new technologies or designs, this legal standard would maximize social welfare. Such a standard would lead companies to market only those technological improvements that enhance long-term consumer welfare.

Fourth, in reality, a gap exists between *ex post* judicial interpretation of facts and their future consequences, on the one hand, and *ex ante* prediction

162. See FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 31–48 (2011), available at <http://www.ftc.gov/os/2011/03/110307patentreport.pdf> (explaining the importance of technology transfer and commercialization of the same).

by firms and regulators of how events will play out and how the judiciary will later construe them, on the other. This gap limits innovators' abilities to determine the legality of their current and future actions. Although an absence of legal certainty is a hallmark of legal standards—as opposed to rules—this does not mean that standards are inappropriate. They are pervasive throughout the law and are often desirable, on account of legislatures' limited capacity to envision the full range of future circumstances to which the law will apply and courts' superior ability to mold the optimal parameters of law *ex post*, when the pertinent facts are clear. In the context of spurring original and follow-on innovation, however, a heightened level of legal certainty would seem very desirable. As a result, society should construct an infrastructure, legal and otherwise, that is conducive to research and development. Judicial second-guessing of the relative merits and costs of a challenged course of innovation would do much violence to this goal.

Fifth, the judiciary's propensity to err in construing and comparing the present and future effects of facts should affect the nature of the optimal antitrust rule or standard. Decision theory¹⁶³ informs analysis under conditions of uncertainty and requires policymakers to compare the relative costs and benefits of Type I and II errors. Those categories, for present purposes, refer to the law's erroneously condemning a socially desirable invention and mistakenly permitting a welfare-reducing act of supposed innovation, respectively. Having identified the social harms of erring in these directions, one must then determine the propensity for market self-correction. In this regard, false positives and false negatives may not prove to be equally enduring, which then requires consideration of the net social cost of systematically erring in one direction over the other.¹⁶⁴

Sixth, the expense of anti-monopolization litigation, the length of time between the onset of allegedly exclusionary behavior and the successful resolution of an ensuing lawsuit, the speed and magnitude of technological change, and the limited remedial powers available to courts to arrest anticompetitive effects are relevant to constructing the optimal legal standard. These factors suggest that, in order for an enforcement action against predatory innovation to be socially desirable, it should seek to halt an anticompetitive practice that possesses exclusionary effects that are apt to have enduring repercussions on competition.

163. Decision theory addresses utility maximization under conditions of uncertainty. *See, e.g.,* Adam M. Samaha, *On Law's Tiebreakers*, 77 U. CHI. L. REV. 1661, 1663 n.9 (2010).

164. For the authors' more in-depth discussion of this issue, see Alan Devlin & Michael Jacobs, *Antitrust Error*, 52 WM. & MARY L. REV. 75 (2010).

Collectively, these six principles inform the construction of a responsible antitrust standard. The first two suggest that antitrust laws, properly crafted and applied, could enhance social welfare by spurring greater levels of competition and innovation. The third provides that a simple cost-benefit analysis is most desirable in the absence of judicial error and in the presence of legal certainty.¹⁶⁵ An interesting corollary of this pure cost-benefit standard for legality is that it would allow courts to condemn a valuable act of invention that marks a significant contribution over the prior art, if the invention is apt to yield a period of entrenched monopoly in which dynamic rates of innovation are unlikely to flourish. The D.C. Circuit's current standard governing exclusionary product design reflects this approach.¹⁶⁶

B. THE SOCIAL-WELFARE CALCULUS UNDER AN ANTITRUST STANDARD

Before discussing how considerations of error, uncertainty, and the practical limitations of litigation complicate analysis and alter the characteristics of the optimal antitrust test, it is illuminative to consider how a legality condition tied to a social-welfare calculus would operate. Specifically, what constitute the relevant costs and benefits that courts would consider in determining whether a challenged invention is, on the whole, welfare enhancing or welfare reducing?

There are two forms of potential benefit—one obvious, the other less so. The first and more obvious form represents, in part, the utilitarian gain realized by the consumption of new technology and improved products. In the modern information economy, advances in commercialized science are apt to be significantly greater contributors to consumer welfare than price differentials.¹⁶⁷ Nevertheless, the social gains of an innovation invariably exceed those realized by the consumers and purveyors of a newly marketed technology because the underlying technical know-how enhances the public storehouse of scientific knowledge, thus informing follow-on research and development.¹⁶⁸ Calculating the aggregate future value of an invention, discounted to present value, poses an intractable challenge, not least because

165. Of course, and as we explore below, pure legal certainty never exists under Section Two of the Sherman Act (15 U.S.C. § 2).

166. See *United States v. Microsoft Corp.*, 253 F.3d 34, 58 (D.C. Cir. 2001).

167. See, e.g., Joseph F. Brodley, *The Economic Goals of Antitrust: Efficiency, Consumer Welfare, and Technological Progress*, 62 N.Y.U. L. REV. 1020, 1026 (1987); Joel I. Klein, Assistant Attorney Gen., U.S. Dep't of Justice, Address Before the American Intellectual Property Law Assoc., Cross-Licensing and Antitrust Law (May 2, 1997), available at <http://www.justice.gov/atr/public/speeches/1118.pdf>.

168. See Brett Fischman & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257 (2007).

it is often difficult to predict the future significance of a particular contribution to the relevant art.

The second variant is subtler. It straddles the blurry line between incentive-yielding gains and welfare-reducing monopoly. An important source of potential gain from a challenged product design or other innovation emanates from the economic function of exclusion. This may appear paradoxical, as exclusivity seems axiomatically undesirable, but some closed systems operate as important appropriation mechanisms.¹⁶⁹ By engineering, marketing, or otherwise arranging their products in a particular way, dominant incumbents may be able to delay entry, hinder such entry's effectiveness, or cause it to occur on a reduced scale.¹⁷⁰ In this manner, dominant incumbents can extract a greater proportion of the social value of their products or services and enhance their profits. This may seem always and everywhere to be improper. Indeed, by elevating prices in the short term, exclusion of this sort imposes an undeniable cost in terms of static efficiency. Yet, appropriation mechanisms, which include intellectual property, first-mover advantage, and trade secrets, as well as strategic conduct aimed at extending periods of exclusivity, may be indispensable to innovation.

The problem, from a policy standpoint, arises once again from an intractable uncertainty. In particular, it is not perfectly clear how much of an invention's value an inventor must appropriate in order to have sufficient incentive to invest, nor how much appropriation is "socially correct." It is clear, however, that without some degree of appropriability, incentives to invent and to market inventions will diminish, perhaps to socially harmful levels. To say that an inventor frustrates entry through innovation, then, is not necessarily to condemn the exclusionary act. In at least some situations, innovation that excludes competitors will enhance dynamic, long-run efficiency by promoting incentives to invent and commercialize technologies. Demarcating the limited circumstances in which exclusion is likely to be socially beneficial is a necessary element of analysis.¹⁷¹

Against these potential contributions to social welfare, a court wishing to apply a comprehensive balancing test must weigh the costs of a challenged design or invention. The nature of the relevant costs is complicated by the

169. See, e.g., Alexander E. Silverman, Note, *Myth, Empiricism, and America's Competitive Edge: Intellectual Property Antitrust Protection Act*, 43 STAN. L. REV. 1417, 1437 (1991).

170. See, e.g., Thomas J. Campbell, *Predation and Competition in Antitrust: The Case of Nonfungible Goods*, 87 COLUM. L. REV. 1625, 1657 (1987).

171. For a sophisticated discussion of the nature of open and closed systems, see Jonathan M. Barnett, *The Host's Dilemma: Strategic Forfeiture in Platform Markets for Informational Goods*, 124 HARV. L. REV. 1861 (2011).

off-setting and incommensurable significance of short- and long-term negative consequences. The immediate, or static, results of an invention that delays or hinders the availability of substitute products consist of the higher prices that consumers must pay and the forgone utility premium that they would have enjoyed by consuming preferred products that would otherwise have been available. These effects are at least roughly measurable—at least in most settings—but the longer-term consequences of invention-induced exclusion are far harder to quantify.

Because it is almost impossible to predict future paths of innovation and competition in technology markets, the ultimate effect of an exclusionary act is elusive. The requisite analysis concerns not only the path of development and competition for the technology incorporated in the “improved” product, but also that for distinct, follow-on inventions. A representative issue in the *Microsoft* case concerned the effect of the software giant’s exclusionary tying practice on “nascent” competition from web-based programs running on Java that could potentially bypass users’ operating systems.¹⁷² It was impossible to determine whether such competition would be viable, and whether Microsoft’s acquisition of a monopoly over Internet-browsing software would have foreclosed any competition. However, those determinations were crucial to the question whether the challenged action of product design (tying Internet Explorer to Windows) was welfare enhancing and hence lawful, or welfare reducing and thus violative of antitrust laws. The question of long-run effects is indispensable to analysis, but reliable, evidence-based answers are unavailable. Therefore, courts and antitrust enforcers must resort to answers to theoretical, and highly contestable, claims about the relative virtues of concentrated versus competitive market structures, as well as to political predispositions concerning acceptable levels of appropriation through closed systems vis-à-vis open alternatives.

It follows that even a purportedly “simple” test that would weigh the costs and benefits of an invention, and find it lawful if the result of the calculus was positive, is confoundingly difficult to apply. It would require courts to calculate—or rather to estimate—unobservable future consequences and to distinguish harmful exclusion from the kind that permits efficient incentive-generating appropriation. The arduous nature of this task, which far exceeds the realistic fact-finding capacity of courts, implicates the crucial role of error. This Article therefore moves from the unrealistic case of zero error and perfect legal certainty, under which conditions the D.C. Circuit’s

172. See *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001).

approach makes sense, to consider complicating features of actual antitrust practice.

C. A PROPOSED TEST FOR ADDRESSING CLAIMS OF ANTICOMPETITIVE INNOVATION

In light of the preceding discussion, it should be clear that judicial efforts at weighing the costs and benefits of a challenged invention are fraught with danger. Given the precarious nature of the fact-finding involved, economics suggests that courts should heed the lessons of decision theory in fashioning an analytical framework. Broadly, decision theory would require courts to consider the consequences of erring in one direction over another.¹⁷³ These consequences are generally circumstance-specific, though as a broad prescription, it is commonly supposed that Type I errors (“false positives”) are worse from an antitrust-policy perspective than Type II mistakes (“false negatives”).

Applied to the phenomenon of predatory innovation, a Type I error arises when a court condemns a genuine invention, the long-term benefits of which exceed its costs. The magnitude of the error depends on the significance of the invention, as well as on the consequential effects on future innovation—the marginal disincentives—realized by creating a precedent hostile to exclusionary invention. Importantly, the capacity for the market to self-correct is limited to the extent that a certain number of future inventors may decline to invent, as much or at all, in light of the inhibitory ruling.

Conversely, a court commits a Type II error when it allows an illusory invention with exclusionary effects, or a real innovation that carries larger social costs than benefits, to pass muster. Self-correction depends on the exclusionary effect of the erroneously approved product design. If it fetters rivals’ abilities to market competing goods, the false negative will likely result in modest harm to competition. Indeed, its second-order effects could be positive by creating a legal environment conducive to invention, thus spurring inventors otherwise worried about legal consequences to market their technologies and to compete aggressively. Of course, against such possible advantages, one would have to weigh the negative incentive generated by an overly permissive rule for dominant firms to devote greater resources to strategic exclusion through meager improvements rather than to focus on genuine acts of welfare-enhancing innovation. Once more, the extent of these repercussions depends on the severity of the relevant error. If a self-described “improvement” was nothing of the kind, and its marketing

173. It also instructs that, when two candidate tests are equally good, or bad, the cheaper ought to be adopted.

carried powerful exclusionary effects, then a Type II error could have significant repercussions.

These features of erroneous decision making lead us to a number of conclusions.

1. *A System That Favors False Negatives Is Preferable*

First, because the severity of a Type I error rises in proportion with the value of the erroneously condemned invention, a bias in favor of Type II errors is justified when a court finds that an impugned innovation entails a material improvement over the prior art. As a result, a defendant should be able to defeat antitrust liability by establishing that its product design carries significant technical advantages. Even though some such inventions may generate negative consequences that exceed the relevant benefits, those cases are so limited and the nature of a Type I error so much more severe that a systemic preference in favor of false negatives is appropriate.

2. *Courts Should Not Distinguish Significant from Trivial Inventions*

Second, one might be tempted to qualify this systemic preference for Type II errors by adopting a more stringent antitrust standard to assess what fact-finders determine to be less significant inventions. Scrutinizing such technologies or product designs may warrant less deference to the risk of false positives because the cost of Type I errors would be relatively modest. Policymakers, however, should resist this view. One of the problems with any rule of law that might condemn “small” innovations whose harms arguably outweigh their benefits—setting aside the weighing problems and assuming that a powerful incumbent has made at least a small improvement to its dominant product—is that the dominant company cannot know *ex ante* whether its innovation, or contemplated innovation, will be deemed significant enough to pass the test (or so small as to fail it). This uncertainty might dissuade it, on the margin, from making “borderline” innovations. Furthermore, in some industries, incremental improvements over the prior art characterize the great majority of innovation, and so even if the cost of a single Type I error in assessing a relatively modest improvement is low, the cumulative effect of many such mistakes could be serious.

3. *A Material Improvement Standard Where Invention Eliminates Consumer Choice*

Third, Type II errors are apt to be most costly when market mechanisms are ineffective in curing the monopoly conditions created or maintained by an exclusionary product design. The principal justification for preferring Type II over Type I errors lies in the perceived tendency of market forces to erode erroneously permitted anticompetitive practices, as the supranormal

profits facilitated by those practices attract entry and hence competition.¹⁷⁴ If industry conditions are such, however, that entry is unlikely to erode the anticompetitive conditions occasioned by a predatory product design, then the systemic preference in favor of Type I errors may no longer be justified. Illustratively, if a strategic product introduction bolsters a dominant company's position, enabling it to control access to consumers and hence to exclude rivals, courts should not dismiss antitrust suits challenging the innovation as predatory. Applying this principle to legal doctrine, when a challenged innovation prevents an inventor's competitors from marketing their goods to consumers, and thus eliminates consumer choice, a court should scrutinize the invention to determine whether it entails a material—that is, a cognizable—improvement. This follows from the fact that, if a strategic innovation denies consumers access to other companies' products, Type II errors raise heightened concerns, which justifies a court's inquiring into the existence and quality of the claimed innovation. This rule might appear to be similar to the Ninth Circuit's approach in *Tyco*, which deemed a patentable improvement to be inconsistent with an antitrust violation. The material-improvement standard that this Article advocates, however, would only apply when a defendant's action eliminates consumer choice. *Tyco* concerned a situation in which the defendant had not forced consumers to adopt its new product. Under this Article's standard, a strategic product redesign that did not foreclose rivals from selling to consumers would be lawful on that basis alone.

4. *Immunity from Antitrust Liability Where Invention Fetters
Consumer Choice*

Fourth, and conversely, in cases where a product design fetters, but does not eliminate, competitors' ability to offer rival goods to consumers, the new design should be immune from antitrust challenge. This follows from the fact that serious exclusionary effects are most unlikely if the challenged invention does not compromise third parties' ability to market their own products to the consuming public. In that event, competition and consumer choice both remain intact. Moreover, as the costs of Type II errors are apt to be relatively small when competition presents consumers with a choice of

174. Conversely, conventional theory assumes that Type I errors result in permanent inefficiencies because market forces cannot undo an improper legal rule. We have previously questioned the assumption that Type I errors in the antitrust field are impervious to market and other pressures. See Devlin & Jacobs, *supra* note 164, at 98–99.

substitute products,¹⁷⁵ a bias against false positives in such circumstances is appropriate. This view follows from the fact that the technological superiority of one company's product necessarily disadvantages its competitors. Public-choice theory predicts that those rivals are likely to seek recourse through the legal system.¹⁷⁶ The history of competition-law enforcement tells a disheartening tale of the judiciary's and enforcement agencies' willingness to entertain such appeals,¹⁷⁷ further justifying per se legality when exclusionary effects are limited.

V. THE UNIQUE CASE OF PRODUCT HOPPING

Having explored the numerous public-policy challenges that antitrust claims of predatory product improvement implicate, and having articulated a proposed standard by which to judge those challenges, this Part considers what many regard as the most blatant instance of anticompetitive innovation: the practice known as "product hopping." This example is simultaneously illuminative and challenging with respect to the Article's proposed standard, for product hopping occurs within the highly regulated pharmaceutical industry. The interplay of antitrust and regulation creates special problems, in particular for the proper treatment of predatory innovation.

Product hopping refers to a drug company's reformulation of its (dominant and patented) product in such a way and at such a time as to simultaneously extend the patent life of that product and to squelch competition from actual and would-be generic rivals. Product hopping can take one or more of several forms: first, the manufacturer may reformulate its drug, changing it from a capsule to a tablet, or to an extended-release or chewable form; second, it can change the molecular make-up of the drug, by adding or removing chemical compounds; and, third, it can combine in one formulation two or more drug compositions that it had previously marketed separately.¹⁷⁸

Product hopping is but a particular instance of exclusionary innovation. As with the cases of alleged predatory invention explored above, it raises the

175. This is because competition will undo anticompetitive effects brought about by a predatory innovation when that innovation does not foreclose rivals from accessing consumers.

176. See, e.g., THE CAUSES AND CONSEQUENCES OF ANTITRUST: THE PUBLIC CHOICE PERSPECTIVE 180–81 (Fred S. McChesney & William F. Shugart II eds., 1995).

177. See, e.g., WILLIAM H. PAGE & JOHN E. LOPATKA, THE MICROSOFT CASE: ANTITRUST, HIGH TECHNOLOGY, AND CONSUMER WELFARE 28 (2007).

178. See, e.g., Rebecca S. Yoshitani & Ellen S. Cooper, *Pharmaceutical Reformulation: The Growth of Life Cycle Management*, 7 HOUS. J. HEALTH L. & POL'Y 379, 388–403 (2007).

problems of measuring the fact and the quality of invention, and of determining when “small” innovations are “predatory.” And, as with those cases, three potential sources of fact-finding exist: courts, the PTO, and consumers.

Product hopping can discourage and defeat generic entry in part because of the requirement that generic entrants comply with state drug-product-selection laws. Those laws, intended to provide consumers with lower-priced drugs, permit and often require pharmacists to substitute generic versions of brand-name prescriptions issued by doctors. In order for this substitution to occur, the generic version of the branded drug must be “AB-rated” by the FDA, which signifies (and requires) that the generic is the therapeutic equivalent of the brand, with the same active ingredient, form, dosage, strength, safety, and efficacy profile. Product hopping—through, for example, a change in the form or the dosage of the branded drug, made just before planned generic entry—can destroy this equivalence or postpone its attainment for a significant period of time. Although pharmacies can sell the generic drug during that time to consumers who specifically request it, they cannot on their own initiative substitute the generic for the brand-name drug, a prohibition that can critically undermine the profitability, or the entry strategy, of the generic.

A. *ABBOTT LABORATORIES V. TEVA PHARMACEUTICALS: THE DEFINITIVE EXAMPLE OF PRODUCT HOPPING TO EXCLUDE GENERIC COMPETITION*

*Abbott Laboratories v. Teva Pharmaceuticals USA, Inc.*¹⁷⁹ is the poster child for the campaign to condemn product hopping. In that case, the FDA had approved Abbott’s capsule version of TriCor—a drug used to lower cholesterol and triglyceride levels—in 1998. Shortly thereafter, two generic firms filed Abbreviated New Drug Applications (“ANDAs”),¹⁸⁰ which challenged the patent underlying the TriCor formulation.¹⁸¹ In 2003, the courts hearing the claims upheld their challenges, enabling them to market their products.¹⁸² This favorable judicial outcome did not, however, result in the generic entry that might otherwise have occurred. While the litigation was

179. 432 F. Supp. 2d 408 (D. Del. 2006).

180. Companies filing ANDAs certify that a proposed generic drug is bioequivalent to an approved drug, thus allowing a generic-drug manufacturer to take advantage of the pioneer-drug producer’s hard-earned safety and efficacy data. *See, e.g.*, Timothy A. Cook, Note, *Pharmaceutical Patent Litigation Strategies: Balancing Patent & Antitrust Policy Through Institutional Choice*, 17 MICH. TELECOMM. & TECH. L. REV. 417, 426 (2011).

181. *Abbott Labs.*, 432 F. Supp. 2d at 415.

182. *Id.* at 416.

pending, Abbott lowered the drug's strength, switched its formulation from capsule to tablet, stopped selling capsules, and repurchased from the pharmacies the entire outstanding stock of capsules.¹⁸³ These steps prevented generic substitution, since the generic capsules differed in form and dosage from the brand's new tablets, and since there were no longer any capsules to which the generics' offerings were equivalent.

Discouraged but undeterred, the generics proceeded to develop equivalents to the tablet formulation and submitted new ANDAs to the FDA challenging the patent underlying that formulation.¹⁸⁴ However, while the challenge was pending, Abbott again switched to a new tablet formulation, with a slightly lower dosage of the active ingredient, stopped selling the "old" tablets, and took other steps to foreclose the generics from availing themselves of the state substitution laws.¹⁸⁵ This conduct prompted the generics to sue Abbott for having engaged in a course of "predatory" innovation, a claim which Abbott moved to dismiss on the grounds, among others, that "any product change that introduces an improvement, however minor, is per se legal under the antitrust laws."¹⁸⁶

After first acknowledging that a serious factual question existed as to whether Abbott's change effected any improvement to its product, the district court assumed for purposes of analysis that there was such an improvement and then applied the *Berkey* test as the basis for analyzing Abbott's motion. The court read *Berkey* to rest on three considerations. First, courts should be reluctant to weigh the anticompetitive harms caused by the introduction of a new product against its technological benefits, where the "weighing had already occurred in the marketplace."¹⁸⁷ Second, this reluctance should depend crucially upon the presence of consumer choice in the relevant market, and the absence of "coercion."¹⁸⁸ Third, greater scrutiny is appropriate "when the introduction of a new product by a monopolist prevents consumer choice."¹⁸⁹

This analysis implicitly rejects the per se approach Abbott advocated and adopts instead a rule-of-reason methodology that looks to (1) whether the defendant is dominant in a properly defined antitrust market; (2) whether it has introduced a product that in some way "improves" on its predecessor; (3)

183. *See id.* at 415–16.

184. *Id.* at 416.

185. *Id.* at 416–17.

186. *Id.* at 420.

187. *Id.* at 420–21.

188. *Id.*

189. *Id.*

whether that product introduction caused anticompetitive harm to consumers and rival firms; and (4) whether the harm was attributable to an absence of consumer choice caused by the dominant firm. Because Abbott's conduct as described above—buying back the older formulations in order to prevent generic substitution—might plausibly have eliminated or reduced consumer choice, the court denied Abbott's motion to dismiss.¹⁹⁰

B. ACADEMIC HOSTILITY TOWARD PRODUCT HOPPING

The academy has been critical of product hopping and has generally urged courts to apply antitrust laws so as to forbid it.¹⁹¹ Noteworthy in this respect is Professor Michael Carrier's recent article, which contends that product hopping has added a new and unsettling dimension to the problem of "reverse payments," a development which over the past five years has generated significant commentary, litigation, appellate opinions, inter-agency disputes, and failed legislation, but no consensus around a proposed solution.¹⁹² Simply put, a reverse payment occurs when a brand-name (pioneer) pharmaceutical firm and a generic company settle patent infringement litigation by agreeing that the pioneer will pay the generic a (usually) sizeable sum to drop its patent challenge and to delay entering the market for some period of years.¹⁹³

In Carrier's view, while reverse payments and product hopping are each apt to be anticompetitive on their own, they are even more anticompetitive in combination.¹⁹⁴ Thus, he argues, a reverse-payment settlement that prevents patent challenges for a period of time—even if it allows generic entry before the expiration of the patent—"gives the brand firm the space in which it can comfortably switch the market to the new product" by the time such entry

190. *Id.* at 434.

191. *See, e.g.*, Stacey L. Dogan & Mark A. Lemley, *Antitrust Law and Regulatory Gaming*, 87 TEX. L. REV. 685, 687–88 (2009); Steve D. Shadowen, Keith B. Leffler, & Joseph T. Lukens, *Anticompetitive Product Changes in the Pharmaceutical Industry*, 41 RUTGERS L.J. 1 (2009); Michael Stumo, *Anticompetitive Tactics in Ag Biotech Could Stifle Entrance of Generic Traits*, 15 DRAKE J. AGRIC. L. 137, 147–48 (2010); *cf.* Jessie Cheng, *An Antitrust Analysis of Product Hopping in the Pharmaceutical Industry*, 108 COLUM. L. REV. 1471 (2008). *But see* Daniel A. Crane, *Provigil: A Commentary*, 3 HASTINGS SCI. & TECH. L.J. 453, 454–57 (2011) (arguing that the courts should not "get into the business of scrutinizing 'product hopping'").

192. *See* Michael A. Carrier, *A Real-World Analysis of Pharmaceutical Settlements: The Missing Dimension of Product Hopping*, 62 FLA. L. REV. 1009 (2010).

193. *See In re Ciprofloxacin Hydrochloride Antitrust Litig.*, 604 F.3d 98 (2d Cir. 2010), *cert. denied*, 131 S. Ct. 1606 (2011); *Ark. Carpenters Health & Welfare Fund v. Bayer AG*, 544 F.3d 1323 (Fed. Cir. 2008); *Schering-Plough Corp. v. Fed. Trade Comm'n*, 402 F.3d 1056 (11th Cir. 2005); *In re Cardizem CD Antitrust Litig.*, 332 F.3d 896 (6th Cir. 2003).

194. *See generally* Carrier, *supra* note 192.

can occur.¹⁹⁵ As a consequence, the generic's entry will become difficult, unprofitable, or both, and therefore less likely. In this way, Carrier claims, the combination of reverse payments and product hopping creates "a significant roadblock to pharmaceutical competition."¹⁹⁶

As evidence of the anticompetitive nature of these practices, Carrier offers two case studies involving the interplay between reverse payment settlements and product hopping.¹⁹⁷ In each, the pioneer manufacturer, faced with imminent competition from generics and the consequent loss of millions of dollars of monopoly rents, sued the generics for infringement. The pioneer manufacturers then made large reverse payments to settle the cases on terms that allowed generic entry years before the expiration of the payment but that also preserved the pioneer's exclusivity for a period of years. They then used that period—along with pricing and promotion strategies—to switch the market to a newly patented formulation that offered only "modest improvements" to patients.¹⁹⁸ In each case, generic entry came too late or not at all and was competitively ineffective, failing to afford consumers the lower prices that presumably would have obtained in the absence of the settlement.

One of the linchpins of Carrier's argument is that product hopping is a charade. Pioneer firms deploy it to persuade consumers (and doctors) to ignore their best interests and buy (or prescribe) a high-priced new drug—protected by a weak formulation patent—that is either no better or not sufficiently better than its predecessor to justify the high price and the generic competition sacrificed by the settlement.¹⁹⁹ Carrier thus implicitly casts product hopping as a form of predatory innovation, suggesting that it allows dominant firms to unfairly exclude equally efficient rivals by making unimportant changes to their dominant but at-risk products.

C. ANALYZING PRODUCT HOPPING UNDER THIS ARTICLE'S PROPOSED ANTTITRUST STANDARD

Product hopping displays all of the typical hallmarks of predatory innovation and is thus a representative form of strategic exclusion that is worthy of consideration. Most cases of predatory innovation entail allegations that the defendant designed a challenged product to disadvantage its rivals. One finds such accusations in a wide variety of classic cases from

195. *Id.* at 1009.

196. *Id.*

197. *Id.* at 1022–30.

198. *Id.* at 1023–24.

199. *Id.* at 1020–21.

IBM's challenged design of its CPUs in the 1970s to Microsoft's integration of its Windows and Internet Explorer products in the 1990s. Product hopping is no different, as few doubt that a principal motivation for the practice is the desire to exclude competition. Furthermore, resolving antitrust claims founded on product hopping requires, at least in the first instance, a comparison between the qualitative benefits of the relevant reformulation, if any, and the costs imposed by the same in excluding competition. Issues of judicial competence and error costs greatly influence analysis of product hopping, as they do claims of anticompetitive invention more generally. For these reasons, the phenomenon is a fitting candidate for illustrative application of our proposed antitrust standard. The fact that product hopping is today one of the most controversial practices at the intersection of antitrust and intellectual property makes it an ideal object of consideration.

Antitrust analysis of product hopping poses unique difficulties because of the complex regulatory environment within which the practice occurs. These complications are themselves illuminative of the larger problem of regulating the process of innovation through competition laws. U.S. antitrust jurisprudence has developed a series of principles aimed at fostering efficient market processes, in part by ensuring that dominant companies cannot exclude equally or more efficient competitors. These principles, which are simultaneously hostile to free riding and generally receptive of companies' efforts to appropriate the value created by their investments, may find themselves in conflict when applied to regulated industries.

In our view, regulatory gaming, of which strategic drug reformulation is a particularized example,²⁰⁰ is a phenomenon that competition law is ill-suited to address.²⁰¹ By encouraging generic drug makers to challenge patents held by brand manufacturers, the legal infrastructure governing the pharmaceutical industry—the Hatch-Waxman Act in particular²⁰²—goes to great lengths to foster free riding on what may be a uniquely large scale. Indeed, companies operating in the pharmaceutical industry are subject to no less than three distinct forms of regulation—the FDA, state generic-substitution laws, and the PTO—which are collectively designed to foster a qualified form of piggybacking on others' investments. As explained below, antitrust law cannot condemn certain forms of product hopping without

200. *See generally* Dogan & Lemley, *supra* note 191.

201. For an interesting discussion of how the law ought to deal with regulatory gaming, see Donald T. Hornstein, *Resiliency, Adaptation, and the Upsides of Ex Post Lawmaking*, 89 N.C. L. REV. 1549, 1575–76 (2011).

202. Drug Price Competition and Patent Term Restoration (Hatch-Waxman) Act, Pub. L. No. 98-417, 98 Stat. 1585 (1984) (codified as amended at 35 U.S.C. § 156 (2010)).

radically altering long-existing tenets of its jurisprudence. We suggest that rewriting the law in this way is undesirable, and so the practice of product hopping requires a regulatory, rather than an antitrust, solution.

Before explaining this result, one must address the potential value of the formulation patents generally associated with product hopping, for if those patents necessarily lack merit, one could safely condemn a large fraction of all product hopping. According to the medical literature, however, changes in drugs from one form of delivery to another can yield real, albeit modest, benefits to doctors and their patients.²⁰³ It is not the case, therefore, that product hopping necessarily amounts to a redesign utterly lacking in qualitative benefit. As a consequence, courts engaged in antitrust analysis of this phenomenon must concern themselves with Type I errors, which would occur if they condemned a company for marketing a newly formulated drug that provides consumers with new and genuine benefits. The judiciary must also be conscious of the risks posed by a vague antitrust rule potentially hostile to drug reformulations, as such precedent could dissuade pharmaceutical companies from withdrawing prior drugs from the market and replacing them with what they consider to be better versions based on delivery method, dosage, or other relevant criteria.²⁰⁴ Indeed, it may be difficult for pioneer-drug manufacturers to determine whether or not a planned replacement of one version of a drug with another will invite cries of illegal product hopping from generic-drug producers who are planning to enter the relevant market.²⁰⁵

With these issues in mind, we apply our proposed antitrust standard for overseeing allegedly anticompetitive product designs to the product-hopping phenomenon. The first aspect of this approach asks whether a dominant company's introduction of a new product eliminates competitors' abilities to offer their goods to consumers. This inquiry is relatively straightforward in unregulated markets but rather more difficult in the pharmaceutical setting. As noted above, the FDA controls entry into drug markets and will allow ANDA filers to market a particular generic drug only if there is a

203. See, e.g., Gina Shaw, *Drug Reformulation: It's Not Just About Patent Protection*, DRUG DISCOVERY & DEV. (Jan. 1, 2007), <http://www.dddmag.com/drug-reformulation-its-not-just.aspx>.

204. See, e.g., Guy V. Amoresano, *Branded Drug Reformulation: The Next Brand vs. Generic Battleground*, 62 FOOD & DRUG L.J. 249, 256 (2007).

205. See Crane, *supra* note 191, at 454–57.

bioequivalent²⁰⁶ and pharmaceutically equivalent²⁰⁷ pioneer drug listed in the Orange Book.²⁰⁸ By hopping, a brand-name-drug manufacturer can remove the pioneer drug listed in the Orange Book and replace it with a reformulated version. If the hop occurs after the FDA has approved the ANDA application, the “generic” manufacturer can still enter the market and sell its equivalent of the now-withdrawn drug. In such a case, the ANDA filer’s marketed drug and the reformulated brand-name drug will typically occupy the same antitrust market because the latter drug’s new features are unlikely to differentiate it sufficiently to render it non-substitutable.

So, does product hopping foreclose consumer choice? The answer might depend on the timing and effect of the hop. If the incumbent monopolist were to hop after an aspiring generic drug manufacturer filed an ANDA, but before the FDA granted authorization, the brand-name-drug producer would successfully exclude the ANDA filer from the market. In such a situation, the generic-drug company must either file a New Drug Application (“NDA”), thus subjecting it to a cost similar in terms of time and treasure to that experienced by the pioneer-drug manufacturer, or file an ANDA over the new drug. In either event, because the generic-drug company cannot market the particular drug that it wished to sell, the product hop denies consumers a choice of otherwise competitive drugs.

For hops of this nature, our test would require a court to scrutinize the reformulated drug to determine if the changes comprised within it provide a material—that is, a discernible or cognizable—benefit to consumers. For reasons explained above, the fact that the drug manufacturer obtained a patent over the new version is not controlling as to this question. The court would have to entertain expert testimony from medical professionals and pharmacologists as to the nature of the relevant formulation and whether it met a previously unaddressed consumer need (i.e., preference for chewable pills over capsules) or otherwise benefitted patients in a material manner. If

206. Two drugs are bioequivalent (pharmaceutically equivalent) if they contain the same active ingredient and have the same dosage form, strength, and route of administration. 21 C.F.R. § 320.1 (2011).

207. Two drugs are therapeutically equivalent if they are pharmaceutical equivalents and have the same clinical effect and safety profile in administration. *Drugs: Glossary of Terms*, U.S. FOOD & DRUG ADMIN., <http://www.fda.gov/Drugs/informationondrugs/ucm079436.htm> (last updated Feb. 2, 2012).

208. See, e.g., David M. Dudzinski, *Reflections on Historical, Scientific, and Legal Issues Relevant to Designing Approval Pathways for Generic Versions of Recombinant Protein-Based Therapeutics and Monoclonal Antibodies*, 60 FOOD & DRUG L.J. 143, 194–95 (2005). The official name for the Orange Book is *Approved Drug Products with Therapeutic Equivalence Evaluations*, and it is available online at <http://www.accessdata.fda.gov/scripts/cder/ob/default.cfm> (last updated Feb. 2012).

the fact-finder were to determine that the new product offered illusory benefits and was simply a pure substitute over the replaced version, an antitrust violation should follow.

There is another form of hop, however, that would automatically pass scrutiny under the proposed standard—an aspect of our approach that may be controversial in some quarters.²⁰⁹ This version of product hopping would occur if the incumbent's reformulation and replacement of its drug occurred after the FDA had approved the generic's ANDA. In this instance, the ANDA filer would be free to market its drug, though the incumbent's withdrawal of the pioneer drug means that the ANDA filer would be unable to sell its product as a generic. The effect of the hop would thus be to deny the entrant access to generic-substitution laws that facilitate rapid acquisition of market share from the incumbent pioneer-drug manufacturer and similarly to prevent the entrant from marketing its product as a generic equivalent of the brand-name drug. Without these advantages, generic-drug companies invariably fail to make significant inroads, and so entering the market under its own brand name is unattractive. Instead, such companies generally either file an ANDA for the reformulated brand-name drug or simply decline to enter the market. Either way, one might fairly argue, consumers lose.

Should this be an antitrust violation? Under our proposed standard, the answer is no. Because this kind of hop cannot exclude an equally or more efficient rival, it fails to arouse the concern at the heart of Section Two jurisprudence.²¹⁰ George Stigler famously defined an entry barrier as a practice that causes a prospective or actual entrant to experience costs greater than those that the incumbent incurred.²¹¹ This version of product hopping does not satisfy Stigler's definition because it cannot cause generic-drug companies to incur costs in excess of those expended by pioneer drug manufacturers, which on average amount to several hundreds of millions of dollars per drug. ANDA filers free ride on the massive investment and risk experienced by NDA filers, as well as on the advertising expenditures undertaken by the brands to establish familiarity with their drugs' therapeutic qualities and brand names.²¹² A hop that does not foreclose regulatory approval to market a drug requires the entrant to expend considerable

209. See, e.g., Jacobson, Sher & Holman, *supra* note 31, at 27–28.

210. See RICHARD A. POSNER, ANTITRUST LAW 194–95 (2d ed. 2001) (defining an objectionable exclusionary practice as one capable of excluding an “equally or more-efficient competitor”).

211. George J. Stigler, *A Theory of Oligopoly*, 72 J. POL. ECON. 44, 47 (1964).

212. See, e.g., Samuel Mark Borowski, Comment, *Saving Tomorrow from Today: Preserving Innovation in the Face of Compulsory Licensing*, 36 FLA. ST. U. L. REV. 275, 292 n.134 (2009).

resources on promoting its product as a desirable substitute for the reformulated brand-name drug. The business model on which generic-drug companies operate, of course, does not allow for such expenditures, but this should not change the nature of the antitrust inquiry. The problem, if one exists, is that antitrust rules are designed to operate in unregulated markets in which companies enjoy equality of opportunity.

The key insight here is that policymakers should not distort well-established antitrust rules in order to solve what is, at heart, a regulatory problem. Courts do not manipulate other fields of law to prohibit, for example, strategic tax planning that takes advantage of unintended loopholes in the tax code. One would hardly find someone liable for violating the spirit, but not the letter, of duly enacted legislation. Instead, the proper solution is for the legislature to amend the operative statute to end perceived abuses and manipulation of the legal infrastructure. Product hopping in the pharmaceutical industry is an excellent candidate for such a solution.

VI. CONCLUSION

Innovation is the engine of our economy.²¹³ Nothing accounts for more growth or improvement in the lives of consumers. Over the past thirty years, antitrust law, which aims to protect consumer welfare, has come explicitly and robustly to recognize and appreciate the crucial role that invention and the intellectual property rights that protect and encourage it play in fostering that welfare. Predatory innovation, however, can hurt consumers. At least in theory, dominant firms can exclude rivals and maintain their dominance by strategically introducing “new” but unimproved products that deprive their smaller rivals of market share, thus discouraging their entry and reducing consumer choice.

Since predatory innovation is harmful, courts should punish it when it occurs. This approach would be simple if the world of innovation were easily divisible into “good” and “bad,” “harmful” and “benign.” Unfortunately, it is not. Challenged innovations can range from the completely uninventive to the tremendously creative, including everything in between as well as a class whose benefits are yet to be determined.

How are courts to respond then to claims of predatory innovation? If they afford dominant firms too much leeway, consumers may lose the valuable competition that the smaller plaintiff-firms would have provided. Yet if they are too strict, they will force consumers to forgo the value of real

213. *See, e.g.*, DOJ, *supra* note 1; *see also* Hilton Davis Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512, 1529–32 (Fed. Cir. 1995) (Newman, J., concurring).

inventions in the short run while creating disincentives in the long run for dominant firms to invest in research and market new products.

These questions are further complicated by the varying and conflicting levels of institutional competence that might plausibly bear on their resolution. Courts are not expert in determining the fact and extent of a new product's inventiveness. The PTO might have more expertise, but the issuance of a patent is not always a sign that the patented product is truly innovative. Consumer preference might be a useful guide, but consumers can be irrational in their product choices, which are themselves determined by the marketing decisions of the firms that sell the products.

Over the past three decades, four separate U.S. courts of appeals have authored tests designed to resolve claims of predatory innovation. Each of those tests differs significantly from the others. None works. The Federal Circuit focuses on predatory intent, an elusive and ambiguous feature unconnected to market outcomes. The Second Circuit looks most closely at coercion, another ambiguous term with a wide range of potential application and therefore almost no transparency. The Ninth Circuit inquires as to whether the "predator's" product offers any smidgeon of improvement. If it does, there can be no predation; but if it does not, the test is silent about what happens next. Finally, the D.C. Circuit, most ambitiously, has adopted a balancing test, which weighs the consumer benefits of the innovation—after the fact of innovation has been determined—against its harms, in a complex calculus. This test is also opaque, and its only saving grace, thus far, is that the court has had no occasion to deploy it.

These tests all fail for the same reason. Each avoids grappling with the four real questions of interest raised by charges of predatory innovation: (1) has the dominant firm offered consumers an improved product?; (2) if so, how much improvement is necessary to immunize it from the charge of predation?; (3) how and by which institution should the fact of improvement be determined—courts, neutral experts, the PTO, consumers?; and (4) if there has been no improvement, what kinds of competitive effects must follow in order for courts to find predation? The recent phenomenon of product hopping, which is an industry-specific form of predatory innovation, raises all these questions and additional ones as well, given the involvement of the FDA in approving the products for use and of the state pharmacy laws in regulating the sale and substitution of generic drugs.

This Article has described the judiciary's failed efforts to formulate a coherent approach to predatory innovation claims, has analyzed the existing case law, and has explored the institutional conflicts and limitations. It has proposed an improved approach, one that defers to true invention and makes claims of predation hinge on its absence. In the process, this Article

has rejected tests that look to “predatory intent” and “consumer coercion” as meaningless, unworkable, or both.

At the center of this Article’s test is the issue of exclusion, the issue at the heart of Section Two jurisprudence. If the alleged “predator” has not, through its product introduction no matter its inventiveness, excluded an equally efficient firm from the market, it has committed no wrong. Predatory innovation can arise only when there has been exclusion, and only then when the offending product offers consumers nothing new and valuable. This test is not only much simpler to understand and apply than any of those thus far adopted, but more importantly it focuses on the factors that ought to matter to antitrust law: invention, exclusion, and the limits of institutional competence.

