

## AN ALTERNATE APPROACH TO CHANNELING?

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### ABSTRACT

*Intellectual property law has developed a variety of doctrines to police the boundaries between various forms of protection. Courts and scholars alike overwhelmingly conceive of these doctrines in terms of the nature of the objects of protection. The functionality doctrine in trademark law, for example, defines the boundary between trademark and patent law by identifying and refusing trademark protection to features that play a functional role in a product's performance. Likewise, the useful article doctrine works at the boundary of copyright and patent law to identify elements of an article's design that are dictated by function and to channel protection of those features to the patent system. These are important doctrinal tools, and they play valuable roles in the overall intellectual property system.*

*These channeling doctrines, however, reflect an incomplete sense of the interplay between various modes of intellectual property protection. Because they focus on subject matter, the existing channeling doctrines only prevent parties from claiming multiple forms of protection for particular features. They therefore ignore firms' ability to use various intellectual property rights as alternative appropriation mechanisms even when those rights apply to different aspects of a product or service. This Article considers how, if at all, this use of intellectual property rights as alternative appropriation mechanisms ought to inform the boundaries of the various intellectual property regimes. In particular, it considers whether alternative channeling doctrines—ones that would force claimants to elect among types of protection even when those forms apply to different features—are appropriate.*

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## INTRODUCTION

Most discussions of the boundaries of intellectual property (IP) law deal with geographic boundaries—the extent to which IP rights in one country ought to reach activities in another—or subject matter boundaries—the nature and scope of particular IP rights, especially when multiple IP rights might be implicated. This Article focuses on the boundaries of particular forms of protection, but it does so in a somewhat different way. Rather than focusing on the forms of protection available for particular features or types of objects, it focuses on the ways firms can use different forms of IP protection as complementary or alternative appropriation mechanisms, even when the various types of protection apply to different features of a product. I argue that intellectual property theory and doctrine fail to account for the economic complementarity (and even redundancy) of IP rights, and that policymakers must take account of this type of overlap to a much greater extent in shaping the boundaries of intellectual property protection.

## I. EXTANT BOUNDARY-POLICING DOCTRINES IN IP LAW

Several doctrines within intellectual property law attempt to reduce the incidence of overlapping rights. These doctrines define the boundaries of particular rights in terms of the subject matter eligible for protection, and they attempt to channel protection of particular subject matter into one regime or another.

The boundaries these doctrines enforce, however, are defined exclusively in terms of the object of protection. The functionality doctrine in trademark law, for example, polices the boundary between trademark and patent law by identifying features of a product's design or packaging that trademark law will not reach because they are "essential to the use or purpose of the article ... or [affect] the cost or quality of the article."<sup>1</sup> Such functional features must be protected, if at all, by patent law. Indeed, the fact that a claimed feature is or was the subject of a utility patent is strong

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1. *TrafFix Devices, Inc. v. Mktg. Displays, Inc.*, 532 U.S. 23, 32 (2001) (quoting *Qualitex Co. v. Jacobson Prods. Co., Inc.*, 514 U.S. 159, 165 (1995)).

evidence of functionality and “adds great weight to the statutory presumption that features are deemed functional until proven otherwise.”<sup>2</sup> The functionality doctrine, then, serves primarily to identify features which are properly the subject of patent law rather than trademark law and channel protection of those features to the patent system.<sup>3</sup>

The useful article doctrine similarly polices the boundary between copyright and patent law by identifying and excluding from copyright protection features of an article that are not separable from the article’s utilitarian function.<sup>4</sup> Courts have articulated a number of different tests for determining when particular features are conceptually separable, but all of the tests are intended to differentiate features that are integral to the function of the object from those that are not. The Second Circuit in *Brandir International Inc. v. Cascade Pacific Lumber Co.*,<sup>5</sup> for example, adopted a test that distinguishes between “design elements [that] reflect a merger of aesthetic and functional considerations, [such that] the artistic

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2. *Id.* at 29-30.

3. Functionality also has a competitive dimension, though the Supreme Court has cautioned against overemphasizing competitive need at the expense of the channeling function. Specifically, the Court appeared to endorse the competitive need test of functionality—under which a feature is deemed functional only when exclusive use of the feature would put competitors at a significant non-reputation-related disadvantage—only in cases of aesthetic functionality, where the patent interface is not at issue. *Id.* at 33 (“It is proper to inquire into a ‘significant non-reputation-related disadvantage’ in cases of aesthetic functionality, the question involved in *Qualitex*. Where the design is functional under the *Inwood* formulation there is no need to proceed further to consider if there is a competitive necessity for the feature.”). But even when seen through the lens of competitive necessity, functionality is concerned fundamentally with identifying particular features of a product or its packaging that should not receive trademark protection because of the non-source-designating role those features play.

4. 17 U.S.C. § 101 (2006) (“[T]he design of a useful article, as defined in this section, shall be considered a pictorial, graphic, or sculptural work only if, and only to the extent that, such design incorporates pictorial, graphic, or sculptural features that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article.”). Though it is not obvious from the text of the statute, the feature need not be physically separable to be copyrightable; conceptual separability from the utilitarian aspects of the article is sufficient. *Pivot Point Int’l, Inc. v. Charlene Prods., Inc.*, 372 F.3d 913, 922 (7th Cir. 2004) (“It seems to be common ground between the parties and, indeed, among the courts and commentators, that the protection of the copyright statute also can be secured when a conceptual separability exists between the material sought to be copyrighted and the utilitarian design in which the material is incorporated.”).

5. 834 F.2d 1142 (2d Cir. 1987).

aspects of a work cannot be said to be conceptually separable from the utilitarian elements” and “design elements [that] can be identified as reflecting the designer’s artistic judgment exercised independently of functional influences [and therefore are conceptually separable].”<sup>6</sup> Likewise, although it adopted a somewhat different test, the Seventh Circuit in *Pivot Point* focused on the contribution of particular design elements to the utilitarian function of the article:

Conceptual separability exists, therefore, when the artistic aspects of an article can be conceptualized as existing independently of their utilitarian function. This independence is necessarily informed by whether the design elements can be identified as reflecting the designer’s artistic judgment exercised independently of functional influences. If the elements do reflect the independent, artistic judgment of the designer, conceptual separability exists. Conversely, when the design of a useful article is as much the result of utilitarian pressures as aesthetic choices, the useful and aesthetic elements are not conceptually separable.<sup>7</sup>

All of these tests courts have used to evaluate conceptual separability are similar to the tests for functionality in that, in both contexts, courts exclude certain features from protection because of the nature of those features. The useful article and functionality doctrines reflect a judgment that certain features should be protected, if at all, with a particular form of rights, and they seek to channel protection of those features to the “right” regime.<sup>8</sup> This is

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6. *Id.* at 1145.

7. *Pivot Point*, 372 F.3d at 931; *see also*, *Carol Barnhart Inc. v. Econ. Cover Corp.*, 773 F.2d 411, 419 (2d Cir. 1985) (defining conceptually separable features as those “not in any respect required by their utilitarian functions” or “wholly unnecessary to the performance of the utilitarian function” and contrasting such features with those “inextricably intertwined with the utilitarian [function]”); *id.* at 422 (Newman, J., dissenting) (arguing that conceptual separability exists when an article “stimulate[s] in the mind of the beholder a concept that is separate from the concept evoked by its utilitarian function”); *Kieselstein-Cord v. Accessories by Pearl, Inc.*, 632 F.2d 989, 993 (2d Cir. 1980) (holding that features are conceptually separable when the artistic features are “primary” and the utilitarian features “subsidiary”).

8. Not all subject matter exclusions are motivated by concerns about overlapping rights. The requirement that an invention be nonobvious to be patentable, for example, excludes a number of inventions from patent protection. *See* 35 U.S.C. § 103(a) (2006) (excluding inventions that “would have been obvious at the time the invention was made to a person

the general thrust of channeling doctrines in intellectual property law, of which there are other examples.<sup>9</sup> Courts overwhelmingly conceive of the overlap between types of IP protection in terms of the forms of protection available for particular features. This focus is not wrong; the various extant boundary-policing doctrines play important roles in the intellectual property system. It is, however, an incomplete account of overlapping rights.

## II. IP RIGHTS AS COMPLEMENTARY OR SUBSTITUTE APPROPRIATION MECHANISMS

Exclusive focus on particular features is odd because firms evaluate their IP options from a product perspective rather than a feature perspective. And it is clear that, at the product level, IP rights have overlapping economic effects. Existing channeling doctrines do not capture this form of overlap because it arises not from an attempt to claim multiple rights for the same features, but from the use of different rights regimes to protect different aspects of a single economic product or service. This is an important oversight because firms relying on these multiple forms of protection are often able to capture greater economic benefits than any of the individual regimes assume.

McNeil Laboratories' strategy regarding Tylenol is a case study here. Tylenol is a brand name pain reliever, the active ingredient of which is acetaminophen (also known as paracetamol).<sup>10</sup> McNeil

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having ordinary skill in the art," when "differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art"). Exclusion of obvious subject matter, however, is not motivated by a belief that obvious matter is better protected through some other means; it is instead intended to prevent obvious matter from being protected at all. Thus, while channeling doctrines operate by excluding subject matter from certain forms of protection, they are not co-terminous with subject matter exclusions.

9. Another example is the Copyright Act's exclusion of "idea[s], procedure[s], process[es], system[s], method[s] of operation, concept[s], principle[s], [and] discover[ies]." 17 U.S.C. § 102(b) (2006); see Pamela Samuelson, *Why Copyright Law Excludes Systems and Processes from the Scope of Its Protection*, 85 TEX. L. REV. 1921, 1923 (2007) ("Congress intended for § 102(b) to codify the principal holdings of *Baker* and its progeny to limit the scope of copyright protection in functional writings, such as programs."). A relatively large body of scholarship struggles with the proper form (and scope) of protection for software. See, e.g., Symposium, *Toward a Third Intellectual Property Paradigm*, 94 COLUM. L. REV. 2307 (1994).

10. Tylenol, [http://www.tylenol.com/product\\_detail.jhtml?id=tylenol/headbody/prod\\_reg](http://www.tylenol.com/product_detail.jhtml?id=tylenol/headbody/prod_reg).

began selling acetaminophen in the United States in 1955 under the name Tylenol Children's Elixir.<sup>11</sup> Though various inventions involving acetaminophen remain under patent, including one for extended release acetaminophen particles patented in 2000,<sup>12</sup> the basic compound has long been in the public domain.<sup>13</sup> Indeed Tylenol competes against a number of generic competitors who sell acetaminophen preparations, in addition to the many other pain relief and fever reducing products with different active ingredients. Despite this competition, Tylenol, the chemical composition of which is known and can be copied in exact or near exact form, retails at a significant premium over generic versions of acetaminophen.<sup>14</sup>

This is a serious puzzle because intellectual property theory conceives of the economic consequences of different forms of protection in relative isolation. Consider, for example, the way the narratives of patent and trademark law conflict. According to the conventional patent narrative, patent rights are necessary because, in their absence, competitors who avoided the fixed costs of invention would be able to copy the invention and undercut the inventor's price.<sup>15</sup> This would ultimately drive the price of the invention down to (or near) the marginal cost of production, which would not be sufficient for the inventor to recoup the costs of developing the

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inc&prod=subpreg# (last visited Oct. 23, 2009).

11. McNeil was not the first to market acetaminophen in the United States. That honor goes to Sterling-Winthrop Co., which promoted acetaminophen as a gentler alternative to aspirin. WALTER SNEADER, *DRUG DISCOVERY: A HISTORY* 439 (2005).

12. Extended Release Acetaminophen Particles, U.S. Patent No. 6,126,967 (filed Sept. 3, 1998) (issued Oct. 3, 2000).

13. Harmon Northrop Morse of Johns Hopkins University synthesized paracetamol in 1878, and Joseph von Mering first used it clinically in 1887. Alfio Bertolini et al., *Paracetamol: New Vistas of an Old Drug*, 12 C.N.S. DRUG REV. 250, 251 (2006). Paracetamol, however, was quickly discredited in favor of phenacetin, another analgesic, which in turn was supplanted by aspirin. *Id.* at 252.

14. According to Walgreens.com, as of May 8, 2009, a bottle of 50 Extra Strength Tylenol EZ Tabs (500 mg) sold for \$6.79, whereas 50 tablets of Walgreens Extra Strength Pain Reliever (500 mg), the active ingredient of which is also acetaminophen, sold for \$4.79. <http://www.walgreens.com/store/productlist.jsp?CATID=301393&navAction=jump&navCount=0> (select "Save with Walgreens brand") (visited May 8, 2009) (site has since been updated). In other words, Tylenol sells at a little more than a 40 percent price premium.

15. WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 294 (2003) ("The conventional rationale for granting legal protection to inventions ... is the difficulty that a producer may encounter in trying to recover his fixed costs of research and development when the product or process that embodies a new invention is readily copiable.").

invention.<sup>16</sup> Patent law therefore solves a problem of appropriability, allowing firms to invest the time and resources necessary to develop an invention with confidence they will be able to recoup their investments by excluding others from copying the invention.<sup>17</sup>

The conventional trademark narrative, on the other hand, predicts very different behavior by market entrants. Specifically, trademark law is thought necessary because, in its absence, competitors could enter the market and mimic a producer's goods or services.<sup>18</sup> This would, of course, be a good thing if the patent narrative was true—if the entrants copied faithfully such that consumers got essentially the same product regardless of the source. But trademark law makes a different assumption—that entrants will *not* copy faithfully but instead cut corners in order to make their products more cheaply and increase their profit margins. They could do so without worrying about losing customers because, having copied the senior party's trademark, consumers would attribute the products to the senior party and blame it for the resulting poor quality.<sup>19</sup> Eventually, consumers would lose faith in the trademark as an indicator of quality and stop buying products bearing that mark, or at least substantially discount the price they would be willing to pay for those products. Mark owners will know this, of course, and therefore will not invest in quality to begin with. Trademark law, on this account, intervenes to preserve mark

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16. *Id.*

17. As Landes and Posner note, patent law is also thought to give inventors incentive to disclose their inventions rather than attempt to keep them secret. *Id.*; see also *Aronson v. Quick Point Pencil Co.*, 440 U.S. 257, 262 (1979) (“First, patent law seeks to foster and reward invention; second, it promotes disclosure of inventions, to stimulate further innovation and to permit the public to practice the invention once the patent expires.”). Patent rights promote disclosure because they help solve the “information paradox.” Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1029 (1989).

[I]t seems likely that the patent system at least facilitates disclosure by creating rights in inventions that survive disclosure. Secrecy makes it difficult for inventors to sell or license their inventions to others because it is difficult to persuade someone to pay for an idea without disclosing it, yet once the invention is disclosed, the inventor has nothing left to sell.

*Id.* The concept of the “information paradox” is widely credited to Kenneth Arrow. Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* 609, 614-16 (1962).

18. See LANDES & POSNER, *supra* note 15, at 167.

19. *Id.* at 203.



owners' incentives to invest in product quality by ensuring that they will be able to internalize the benefits of any such investment.

There is clearly something to both of these narratives. Patent law does, in many cases, enable inventors to recoup investment costs they otherwise could not by enabling them to sell their inventions at supracompetitive prices. And trademark law often does protect the integrity of the quality signal a mark provides. But the patent and trademark narratives cannot both be right, at least not at the same time. Either market entrants have the incentive to copy a product faithfully in order to compete with the inventor, or they do not. If entrants are likely to copy very closely, then trademark protection does little for consumers except raise the cost of the products they consume. If the parties' goods or services are of basically the same quality, then consumers suffer little or no harm even if they are confused about the source of the products they encounter. If, on the other hand, entrants are likely to cut corners, producing products that differ materially in quality, then trademark protection takes on greater importance relative to patent law, assuming the quality differences can be signaled through branding. Which of these narratives is most accurate in any given context depends on the dynamics of the market in question, and in particular on whether the market value of a particular product derives primarily from the invention itself or from its branding. But the likelihood that competitors will copy faithfully matters quite a bit in determining whether patent and/or trademark law is necessary, as does the extent to which any deviations in quality can be signaled effectively through branding.

In many cases, branding is at least partially effective as an appropriation mechanism. Producers frequently are able to signal at least some product differences through branding, whether those differences are tangible or not. As a result, firms selling branded products are often able to charge somewhat higher prices than competitors.<sup>20</sup> Put differently, branding often enables producers to price above marginal cost, even if not as much above marginal cost as they could if they were insulated from direct competition altogether.<sup>21</sup>

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20. See, e.g., *supra* note 14 and accompanying text.

21. Cf. Jonathan Barnett, *Private Protection of Patentable Goods*, 25 CARDOZO L. REV.

The market for Tylenol is paradigmatic of this effect. The active ingredient of Tylenol is not protected by patent, and McNeil therefore faces competition from a number of other acetaminophen products, in addition to other pain reducing products with different active ingredients. Yet McNeil continues to price Tylenol significantly above its competitors.<sup>22</sup> This price premium is a consequence of branding. Through years of expensive brand building (that is, advertising), McNeil has persuaded many consumers—rightly or wrongly—that Tylenol *is not* interchangeable with its competitors' nearly identical products. McNeil therefore is able to capture through branding some of the supracompetitive profits patent law is presumed necessary to provide.<sup>23</sup>

McNeil's ability to maintain supracompetitive prices because of the influence of branding is an instance of a phenomenon that has generated much controversy in its own right.<sup>24</sup> But it bears

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1251 (2004) (arguing that producers can rely on a variety of private protection mechanisms, including lead time and branding, as partial alternatives to patent protection).

22. *See supra* note 14.

23. Some law and economics scholars argue that this price premium does not entail deadweight loss because consumers are paying extra for the guarantee of high quality manufacturing or to avoid the cost of determining whether competitive products are in fact equivalent. William Landes & Richard A. Posner, *Trademark Law: An Economic Perspective*, 30 J.L. & ECON. 265, 275 (1987) ("The fact that two goods have the same chemical formula does not make them of equal quality to even the most coolly rational consumer."). Even if Landes and Posner are right that the price differential between Tylenol and generic acetaminophen reflects rational consumer preferences, their argument suggests that inventors *can* capture at least some of their investment in an invention through branding as long as they can inform consumers of the differences between their products and competitors'.

24. Ralph Brown famously bemoaned trademark law's protection of the persuasive function of trademarks, built through "wasteful" advertising. Ralph S. Brown, Jr., *Advertising and the Public Interest: Legal Protection of Trade Symbols*, 57 YALE L.J. 1165, 1190 (1948) ("From what has been said earlier about the economic waste and distortion of consumer choice growing out of large-scale persuasive advertising, it should be clear that the persuasive function of trade symbols is of dubious social utility. There seems little reason why the courts should recognize or protect interests deriving from it."). Debate about the legitimacy of "artificial" product differentiation based on factors other than tangible product characteristics rages on. *See, e.g.*, LANDES & POSNER, *supra* note 15, at 173 ("The implicit economic model that guides the law is our model, in which trademarks lower consumers' search costs by providing them with valuable information about brands and encourage quality control rather than create social waste and consumer deception. The hostile view of advertising anyway is unsound."); Glynn S. Lunney, Jr., *Trademark Monopolies*, 48 EMORY L.J. 367, 420-21 n.212 (1999) (arguing that, to the extent advertising and trademark law generate an unthinking buying response, it does not represent a legitimate form of welfare enhancement, that such unthinking responses might ultimately lead to regret, and that some advertising is a form of blackmail, playing on our insecurities and self-doubts).

highlighting that McNeil has been able to maintain this price differential for a product that, in basic form, has long been out of patent.<sup>25</sup> Advertising can be significantly *more* effective in creating brand loyalty for products that are under patent because of the exclusivity those products enjoy. The amount of advertising necessary to build significant brand loyalty for Prozac, for example, undoubtedly was less than it would have been had Prozac faced competition during the patent period.

In this way, it is not just that trademark protection can provide some of the same type of economic benefits for which patent law is presumed necessary, it also is that the existence of patent protection actually enhances the value of branding and increases the opportunity for brand owners to insulate their products from competition in the post-patent period. This may help explain the results of the FTC's recent study of drug pricing, which showed that, while the average price of drugs declines approximately 20 percent within two years of generic entry, the prices of brand name drugs decline only slightly and in some cases even increase slightly after generic entry.<sup>26</sup> And brand name pioneer drugs maintain significant price premiums over their generic competitors.<sup>27</sup> This is not simply a phenomenon of the pharmaceutical industry either. In fact, recent

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25. There are plenty of similar examples of companies being able to insulate their products from effective competition even when competitors are able to sell chemically identical products. In fact, the *piece de resistance* of modern marketing's ability to differentiate products that are physically indistinguishable from those of competitors is Morton's salt. Salt, like acetaminophen, has a known chemical composition. Yet Morton's has managed to convince many of us that its salt is different. Clorox has done the same with bleach, just as most sellers of bottled water have done with their products, which often come from municipal water supplies. See Phil Lempert, *Is Your Bottled Water Coming from a Faucet?*, MSNBC.COM, July 21, 2004, <http://www.msnbc.msn.com/id/5467759/>; NATIONAL RESOURCES DEFENSE COUNCIL, *BOTTLED WATER: PURE DRINK OR PURE HYPE?* (1999), <http://www.nrdc.org/water/drinking/bw/bwinx.asp> (documenting misleading suggestions that bottled water is more pure).

26. FED. TRADE COMM'N, *GENERIC DRUG ENTRY PRIOR TO PATENT EXPIRATION: AN FTC STUDY 9* (2002), available at <http://www.ftc.gov/os/2002/07/genericdrugstudy.pdf>.

27. *Id.* (citing a "study of 32 drugs that lost patent protection around the time of the passage of the Hatch-Waxman Amendments that found that generic entry results in somewhat higher prices for brand-name prescription drugs (in light of factors such as inelastic demand among users of brand-name products), but large decreases in the prices of corresponding generic drugs").

economic studies have shown that firms often can leverage trademark rights and capture returns on innovative activity.<sup>28</sup>

This failure of intellectual property theory to account for the overlapping economic benefits of patent and trademark protection is reflected in doctrine too, as none of the extant boundary-policing doctrines focus on the ability of a firm to capture the same benefits by using multiple forms of protection to protect different features. Indeed, “courts have consistently held that a product’s different qualities can be protected simultaneously, or successively, by more than one statutory means for protection of intellectual property.”<sup>29</sup>

### III. ACCOUNTING FOR SUBSTITUTE APPROPRIATION MECHANISMS

#### A. *Are Overlapping Economic Benefits a Problem?*

Is it a problem that different modes of intellectual property protection can serve as alternative appropriation mechanisms? In my view it is, at least to the extent that the effects of other forms of protection are not accounted for in shaping the boundaries of particular rights regimes. If, for example, the length of the patent term is determined by reference to the amount of exclusivity inventors need in order to have sufficient incentive to create and disseminate new and useful inventions, and if estimates of the necessary duration do not account for the economic benefits firms can capture through branding, then the term is likely calibrated incorrectly.

Concerns about the economic overlap I have identified have received virtually no attention in case law and precious little in the academic literature. The only extended discussion I am aware of was offered by Gideon Parchomovsky and Peter Siegelman in their article *Towards an Integrated Theory of Intellectual Property*.<sup>30</sup>

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28. See Lee Davis, *How Do Trademarks Affect Firms’ Incentives to Innovate?* 3-4 (Sept. 6, 2006) (unpublished manuscript on file with author) (concluding that trademarks motivate firms to engage in incremental innovation, particularly in the form of product differentiation, and that firms can leverage trademarks indirectly to supplement other strategies of appropriability like patents, secrecy, and lead time).

29. *Kohler Co. v. Moen, Inc.*, 12 F.3d 632, 638 (7th Cir. 1993) (citations omitted).

30. Gideon Parchomovsky & Peter Siegelman, *Toward an Integrated Theory of Intellectual Property*, 88 VA. L. REV. 1455 (2002). Barnett’s paper also deals generally with alternative mechanisms for capturing economic benefits, but it deals only in part with the use of

Parchomovsky and Siegelman refer to the overlapping economic benefits I describe as the “synergistic” or “complementary” effects of branding and patent protection.<sup>31</sup> As they note, “the limited monopoly afforded by patent protection may facilitate the establishment of brand loyalty during the patent life.”<sup>32</sup> This brand loyalty, acquired during the life of the patent, “enables patentees to preserve some of their market share after the patent protection expires.... The net effect of combining patents and trademarks is stronger protection than that afforded by either alone.”<sup>33</sup>

Parchomovsky and Siegelman, however, regard the ability of firms to rely on trademark protection to maintain market share—what they refer to as “trademark leverage”<sup>34</sup>—as efficiency-enhancing. In their view, the availability of trademark protection in the post-patent period reduces an investor’s incentive to price monopolistically during the patent period, decreasing deadweight loss attributable to patent protection.<sup>35</sup> The attendant welfare gains, they argue, outweigh any welfare losses in the post-patent period, during which the producers of the formerly patented products might maintain prices above marginal cost.<sup>36</sup>

Parchomovsky and Siegelman’s model, however, dramatically oversimplifies the interaction between trademark and patent protection. For one thing, their model mischaracterizes the true nature of the trademark protection available in the post-patent period. In particular, Parchomovsky and Siegelman contrast a post-patent world with trademark protection and one without any trademarks at all.<sup>37</sup> In the latter world, they argue, patentees would take full advantage of the patent grant by pricing monopolistically.<sup>38</sup> They would have less incentive to invest in the quality of their products or services, however, because they could not capture the

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branding. Barnett, *supra* note 21.

31. Parchomovsky & Siegelman, *supra* note 30, at 1460, 1473, 1522.

32. *Id.* at 1473.

33. *Id.*

34. *Id.* at 1462.

35. *Id.* at 1479-80.

36. *Id.*

37. *Id.* at 1473.

38. *Id.* at 1473-74. This description is, to some extent, in tension with the view, now widely accepted and endorsed by the Supreme Court, that patent protection does not necessarily imply market power. *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28 (2006).

benefits of such investments through branding. But with trademark protection available, inventors can maximize profits over both the patent and post-patent periods by expanding their customer base during the patent period in order to create brand loyalty they can exploit after the patent's expiration.

In truth, the choices are not nearly as stark as Parchomovsky and Siegelman suggest. Producers in the modern marketplace rely on a variety of different branding devices to distinguish their products, the word mark for the products being only one such device. One has to account for the full range of these branding devices to accurately assess the interaction between trademark and patent law, since patentees may not need all of those branding devices to protect the incentives Parchomovsky and Siegelman identify. Even if trademark law prevented Eli Lilly from claiming the word "Prozac" as a trademark after the patent covering that compound expired, such that competitors could produce the same drug and sell their own versions of the drug as Prozac, Eli Lilly would not be disabled from differentiating its product.<sup>39</sup> Rather, Eli Lilly would simply be forced to rely on branding devices other than the name of the drug—the name of the company producing the drug, for example—to distinguish its product from those of competitors. The fact that company names at least partially fulfill the need for source identification is implicit in Parchomovsky and Siegelman's discussion of the spillover of brand loyalty between different products made by the same firm.<sup>40</sup> It is the common company name that enables such spillovers. Yet Parchomovsky and Siegelman do not account for other aspects of branding like company names or product packaging in evaluating the costs of refusing word mark protection in the post-patent period.

By itself, that failure calls Parchomovsky and Siegelman's conclusions into question since, in the real world, the other aspects of branding matter quite a bit. Tropicana recently announced it had redesigned the packaging of its refrigerated orange juice brand. The new design, according to Tropicana, was protected by twenty design trademarks and copyrights, separate and apart from any trademark protection for the word marks on the container.<sup>41</sup> Tropicana's juice

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39. See Parchomovsky & Siegelman, *supra* note 30, at 1473-74.

40. *Id.* at 1484-86.

41. Kenneth Hein, *Tropicana Squeezes Out Fresh Design with a Peel*, BRANDWEEK.COM, Jan. 16, 2009, [http://www.brandweek.com/bw/content\\_display/eseach/e3if42f3145e3efa9c](http://www.brandweek.com/bw/content_display/eseach/e3if42f3145e3efa9c)

is not patented and never was. But for those products that are patented or have patented components, understanding the combined effect of patent and trademark protection is surely much more complicated than asking whether competitors can use a single word mark, or even some subset of the design features.

In the end, while Parchomovsky and Seigelman are no doubt correct that Tropicana would need some way to communicate the source of its product and to distinguish it from competing products, that observation tells us little about the scope of protection necessary. Yet the consequences for competitors, and the extent to which trademark protection duplicates the economic incentives of patent law, depend significantly on what branding elements an inventor can protect. If, for example, a former patent owner could prevent competitors from mimicking not only a product's brand name but also the design of the product or its packaging, "second movers [might] face a barrier to entering the market because they will have to convince consumers that a product with a quite different appearance is functionally the same as the known product."<sup>42</sup>

Something similar could be said about Parchomovsky and Siegelman's narrow focus on competitors' use of the inventor's trademark. Protection against use of an identical mark for directly competitive products is, of course, at the core of a trademark owner's rights. But a party's rights extend much further under modern standards. Specifically, a mark owner can enforce its rights against any use that is likely to cause confusion among consumers about the source of the imitator's goods or services. So whereas Tropicana's ability to sell its orange juice at a supracompetitive price is dictated primarily by the actions of its direct competitors, the full value, and the full cost, of trademark protection is a function not only of the

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481a81cd68b13e3db. These changes apparently were not well-received, and Pepsi (owner of the Tropicana brand) decided to abandon them less than two months after introducing the new design. Stuart Elliot, *Tropicana Discovers Some Buyers are Passionate*, N.Y. TIMES, Feb. 23, 2009, at B6.

42. Michael Abramowicz & John F. Duffy, *Intellectual Property for Market Experimentation*, 83 N.Y.U. L. REV. 337, 387 (2008). Abramowicz and Duffy see such a barrier to entry as a good thing, in at least some cases, since it may allow a first mover to capture benefits of market experimentation that cannot be captured through patent protection. Lee Davis, on the other hand, suggests that trademark protection that creates barriers to entry might block innovation, possibly by making it more difficult for more innovative companies to enter a market with a noninnovative incumbent with a strong trademark. Davis, *supra* note 28, at 14-17.

number of different features Tropicana can protect, but also the range of contexts in which it can protect those marks. For example, the value of Tropicana's trademark rights and the extent to which those rights interfere with competition are likely quite different if Tropicana can sustain a claim against Google for returning paid search results in response to searches for "Tropicana" than they would be if Google could easily defeat such suits.<sup>43</sup> The value of a brand and the cost of protection likewise may differ substantially depending on how robustly the comparative advertising privilege applies vis-à-vis competitors who purchase the keywords.

On the cost side, Parchomovsky and Siegelman oversimplify market behavior in order to minimize the costs of supracompetitive pricing in the post-patent period. First, they assume brand loyalty in the post-patent period depends only on the size of the customer base established during the patent's life.<sup>44</sup> This assumption allows Parchomovsky and Siegelman to conclude that there is no welfare loss when the patentee continues to charge a supracompetitive price in the post-patent period. According to Parchomovsky and Siegelman, the only consumers who will be paying the supracompetitive price in the post-patent period will be the loyal customers previously attracted by the patent owner; all of the additional customers who enter the market after expiration will buy at the competitive price from market entrants.<sup>45</sup> Thus, although the loyal consumers will continue to pay more than marginal cost, output will reach competitive levels, and the only effects will be distributional—higher profits for the patentee.

But in fact consumers prefer brand name products, and find competing products inadequate substitutes, for a variety of reasons *other* than prior experience with a product. Consumers may prefer

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43. Courts continue to struggle to determine whether use of another's trademark to trigger paid search results violates the mark owner's rights. While the Second Circuit once seemed prepared to reject such claims on the ground that the search engine's use is not "trademark use," it now seems to have joined courts in other circuits in rejecting the trademark use argument. Eric Goldman, Keyword Law, <http://www.ericgoldman.org/Resources/keywordlaw.pdf> (last visited Oct 22, 2009) (collecting cases addressing the question of whether keyword use is "use in commerce").

44. Parchomovsky & Siegelman, *supra* note 30, at 1477 ("Inherent in the definition of brand loyalty is the notion of prior use. Indeed, it would be odd for consumers to be loyal to a product they have never tried.")

45. *Id.* at 1479-80.



familiar established products, even if they have not previously been in the market for such goods.<sup>46</sup> They may have brand preferences learned from their parents' consumption patterns. For example, people tend to buy the same household products (toothpaste, laundry detergent, and so on) as were in their households as children.<sup>47</sup> And consumers may prefer certain brands as cultural objects through which they can express their individuality and/or participate in cultural phenomena.<sup>48</sup> Consumer preference for the iPod, for example, likely has as much to do with the device's cultural meaning as with prior product experience.<sup>49</sup>

In the case of prescription drugs, brand preferences depend in significant part on the prescribing doctor's prior experience with the drug. And doctors' prescribing habits, it is becoming increasingly clear, are not based entirely on information about drug effectiveness.<sup>50</sup> Indeed, the evidence suggests that doctors fall into habits and become accustomed to prescribing certain drugs for particular conditions. They are then reluctant to change their habits even in

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46. Cf. Abramowicz & Duffy, *supra* note 42, at 383 n.131 (recognizing that theoretical economic models sometimes may understate the extent of brand name preferences since "[i]n many contexts, it is possible that new customers will prefer the established product even absent evidence of superior quality").

47. See, e.g., Doug Grisaffe & Hieu Nguyen, *Falling in Love with Brands: An Inductive Qualitative Exploration of Pathways to Emotional Attachment*, 36 ADVANCES CONSUMER RES. 869, 870 (2009) ("It should be noted that inter-generational transfer [of an emotional connection to a brand] doesn't require sentimental/emotional memory. Transfer alone could involve a user of Tide simply saying her grandmother had used it, her mother used it, and so she uses it too."); see also E. Fraj Andres, R. Bravo Gil & E. Martinez Salinas, *Family as a Source of Consumer-Based Brand Equity*, 16 J. PROD. & BRAND MGMT. 188, 195-96 (2007) ("[P]ositive brand information, provided by the family to the young adult via observation, has an important influence on the brand equity formation process.").

48. See generally ROB WALKER, BUYING IN: THE SECRET DIALOGUE BETWEEN WHAT WE BUY AND WHO WE ARE (2008). Walker chronicles the cultural significance of a number of brands and describes the ways in which consumers use brands simultaneously to differentiate and to signal belonging to a particular group.

49. Brands, according to Glynn Lunney, have "popularity networks." Lunney, *supra* note 24, at 429.

50. One recent study found that access to free drug samples had a significant effect on the prescribing practices of residents. Richard F. Adair & Leah R. Holmgren, *Do Drug Samples Influence Resident Prescribing Behavior? A Randomized Trial*, 118 AM. J. MED. 881 (2005) (finding that residents with access to drug samples were less likely to choose unadvertised drugs than residents who did not have access to samples and less likely to choose over-the-counter drugs, and also finding a trend toward less use of inexpensive drugs).

the face of information that a drug is not the most effective treatment.<sup>51</sup>

Whether or not these factors influencing brand preferences are rational in a classical sense, they have real effects in a number of different markets. The important point is that preferences for the branded products in the post-patent period are a function of much more than prior experience with the product during the patent period. We therefore cannot blithely assume that all of the new consumers are paying a competitive price and that all those paying the supracompetitive price developed their loyalty during the patent period. Yet those assumptions are critical to Parchomovsky and Siegelman's conclusion that trademark law creates no deadweight loss in the post-patent period.<sup>52</sup>

### *B. Taking Interaction into Account*

If, as I have suggested, there are reasons to be concerned about the ability of firms to leverage different types of intellectual prop-

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51. Judith K. Hellerstein, *The Importance of the Physician in the Generic Versus Trade-Name Prescription Decision*, 29 RAND J. ECON. 108 (1998) (describing the role of physicians in the decision to use brand name drugs or generic substitutes and the tendency of certain physicians to prescribe one or the other, a tendency not explained by patient characteristics). Indeed, prescribing habits may be resistant even to information regarding drugs' serious risks. Sandra H. Johnson, *Polluting Medical Judgment? False Assumptions in the Pursuit of False Claims Regarding Off-Label Prescribing*, 9 MINN. J. L. SCI. & TECH. 61, 79 (2008) ("[W]hile changes in drug labeling regarding warnings of previously unknown, serious risks are often mailed or faxed directly to physicians, studies indicate that these mailings do not result in changes in prescribing practice—that physicians frequently prescribed drugs in violation of warnings, including black box warnings.") (citing Jerry H. Gurwitz, *Serious Adverse Drug Effects—Seeing the Trees Through the Forest*, 354 NEW ENG. J. MED. 1413, 1414 (2006)).

52. Parchomovsky & Siegelman, *supra* note 30, at 1465. Abramowicz and Duffy similarly downplay the extent to which brand preferences impose barriers to competitive entry when they approvingly summarize Parchomovsky and Siegelman's thesis. Abramowicz & Duffy, *supra* note 42, at 389. Abramowicz and Duffy dismiss any welfare losses caused by supracompetitive prices in the post-patent period, arguing that former patent owners have incentive to keep the differential down because new competitors will be able to enter the market easily and offer the formerly patented product at the competitive price. *Id.* But, of course, this incentive is inversely proportional to the strength of brand preferences. The greater consumers' brand preferences in the post-patent period, the higher their switching costs and the lower the incentive to keep price differential down. And in those cases when the price differential is relatively small because brand preferences are weak, then the patentees have little trademark leverage and there is little reason for the patentee to price below monopolistic levels during the patent period.

erty protection and thereby generate overlapping or redundant economic benefits, then the question is what, if anything, should be done about it. Broadly speaking, there are two possible approaches to reducing the incidence of leverage: (1) forcing claimants to elect the form of protection they wish to pursue, and (2) actively accounting for overlapping economic benefits in shaping the scope of particular rights.

### 1. *A New Doctrine of Election?*

One method for reducing firms' opportunities to leverage multiple forms of IP protection would be to implement a variation of the now discredited doctrine of election.<sup>53</sup> This new doctrine of election would differ from the one rejected in *Yardley* in that it would not focus on whether the same features of a product were subject to multiple forms of protection.<sup>54</sup> Instead, this election doctrine would force a firm to elect between forms of protection at the product level. In the context of a new drug, for example, the inventor would be forced to elect between patent protection for the drug and trademark protection for the name of the drug. If the inventor chose to patent the new drug, competitors would be free at the expiration of the patent not only to produce the same compound but to sell it under the same name. This doctrine, then, would be a stronger version of the *Singer*<sup>55</sup> and *Kellogg*<sup>56</sup> approach—indeed, like the versions of *Singer* and *Kellogg* that Parchomovsky and Siegelman criticize.<sup>57</sup>

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53. See *In re Yardley*, 493 F.2d 1389, 1394 (C.C.P.A. 1974) (rejecting the notion that an author-inventor must elect between copyright and design patent protection).

54. *Id.*

55. *Singer Mfg. Co. v. June Mfg. Co.*, 163 U.S. 169 (1896).

56. *Kellogg Co. v. Nat'l Biscuit Co.*, 305 U.S. 111 (1938).

57. Parchomovsky and Siegelman suggest that *Singer* and *Kellogg* “may be read to have established a per se rule that a mark designating a patented product becomes generic at the end of the patent term.” Parchomovsky & Siegelman, *supra* note 30, at 1471. Though some language in those cases could be read to support their claim, courts have not read the cases as establishing a per se rule. See, e.g., *Thomas & Betts Corp. v. Panduit Corp.*, 138 F.3d 277, 288 (7th Cir. 1998) (“[W]e find that there is no per se prohibition against features disclosed in a patent receiving trademark protection after the patent has expired.”); *Bayer Co. v. United Drug Co.*, 272 F. 505, 509 (S.D.N.Y. 1921) (rejecting a per se rule and noting that “[s]ince [*Singer*] courts have several times said that the name of goods protected by patent might in fact indicate not only the kind of goods they were, but as well that they emanated from a single source”) (citations omitted); 2 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 12:52 (4th ed. 2009) (“Some judicial opinions and legal writers have

Such an election doctrine would be motivated by recognition of the tension between the narratives of patent and trademark protection. In particular, this doctrine would appreciate that competitors either are likely to copy a formerly patented product faithfully—in which case the competitors' products are likely to be relatively indistinguishable—or they are likely to cut corners, producing goods of different quality. This observation is important because, if we had confidence that competitors were producing relatively indistinguishable products, then branding would offer little quality-related information and would only create “artificial” distinctions. If, on the other hand, there are likely to be material differences between the inventor's products and those of competitors, then branding becomes more important to consumers, and it ought to allow producers to capture the benefits of quality differences.

Election, as opposed to a predetermined rule in favor of a particular form of protection,<sup>58</sup> would be proper here as a recognition that the inventor is in the best position to know where competitors are likely to find value. If close copying is likely, then the inventor would rationally choose patent protection and would capture value during the period of patent exclusivity. If, on the other hand, the inventor suspects that competitors will cut corners and consumers are likely to care about quality differences, then it would rationally choose to forego patent protection and elect to brand the product.

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misconstrued the law by stating that when patent rights expire, the mark of the patented article will automatically fall into the public domain along with the invention of the patent. However, this is *not* the law, and never has been.”). Instead courts have understood *Singer* and *Kellogg* to establish a more limited rule prohibiting producers of formerly patented products from relying on de facto secondary meaning to establish consumer association when there is evidence the primary significance of the term to the consuming public is the product rather than the producer. *Cf. J. Kohnstam, Ltd. v. Louis Marx & Co., Inc.*, 280 F.2d 437, 440 (C.C.P.A. 1960) (“We will concede, arguendo, that under such circumstances, *where there is only one source* for a particular kind of merchandise over a period of time, the public might come to associate that source with the name by which the merchandise is called. But such a circumstance cannot take the common descriptive name of an article out of the public domain and give the temporary exclusive user of it exclusive rights to it, no matter how much money or effort it pours into promoting the sale of the merchandise.”). The per se rule Parchomovsky and Siegelman oppose, however, is close to what I have in mind as a new election doctrine.

58. A rule, for example, that would require the inventor to rely only on patent protection and would disqualify her from trademark or copyright protection.

Pushing important decisions to the party with the best information about the relevant considerations is a common policymaking tool, and in many cases it is the best solution. And contrary to Parchomovsky and Siegelman, forcing an election would not prevent sellers from distinguishing their products after patent expiration.<sup>59</sup> Even after the court determined that “shredded wheat” was a generic term, the National Biscuit Company was able to distinguish its shredded wheat from Kellogg’s shredded wheat by using its company name and elements of product packaging. Indeed the court in that case made it clear that, even though Kellogg was entitled to call its product shredded wheat, it was obligated to make clear that Kellogg, and not National Biscuit Company, was the source of the product Kellogg was selling.<sup>60</sup>

Nevertheless, I suspect that an election doctrine would not work particularly well to prevent parties from leveraging multiple forms of protection, or at least that such an approach would create as many problems as it solved. One significant problem was foreshadowed by the earlier discussion of the many different branding devices sellers use for individual products or services. Return for a moment to the Tropicana example. If, as in our hypothetical, Tropicana’s juice had once been patented, Tropicana would be precluded under an election regime from branding the juice product. But, as we noted, Tropicana claimed protection for more than twenty different branding elements on the juice’s packaging, not including the Tropicana word mark. For an election doctrine to be effective, courts would need some way to determine which of those branding devices Tropicana would be precluded from protecting through trademark law. If a court did not disqualify enough of the features, Tropicana would retain a significant amount of the leverage the election doctrine was designed to avoid. But if the court disqualified too many features, it could approach the point where Tropicana could not sufficiently distinguish its juice from that of its competitors.

We need not be too concerned that sellers will not be able to distinguish themselves in cases like *Kellogg*, or in any case in which

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59. Parchomovsky & Siegelman, *supra* note 30, at 1476.

60. *Kellogg*, 305 U.S. at 120-21.

the patented invention is sold as a discrete product.<sup>61</sup> But the problem is much more acute in cases involving patented component parts. In those cases, a court would have to determine whether election of patent protection for a particular component (a microchip, for example) would prevent the seller from using the brand name for the entire product (a computer device). Put differently, courts would have to determine which products the mark owner could not brand because of the election of patent protection for some part(s) of the product. This would presumably require a determination of the relevant product market at issue, and as we have seen in antitrust law, determining what constitutes an economic product market is quite difficult.<sup>62</sup>

## *2. Cross-Boundary Accounting*

In light of these difficulties, an election doctrine of the type I described may not be practicable. It is therefore incumbent on scholars and policymakers to consider much more actively how firms' ability to choose from a menu of alternative, and often complementary, appropriation mechanisms should impact the scope of the various IP rights. In my view, this active consideration should be done with an eye towards reducing the ability of firms to leverage multiple rights to capture redundant economic benefits. But thinking about the issue in this way has an added virtue: even those persuaded by Parchomovsky and Siegelman that leverage can be efficiency enhancing ought to embrace active consideration of the combined effects of various forms of protection. After all, if leverage is good, we should want to create rules that enable it. And obviously we can better enable leverage if we focus on the ways each set of rights influences the others.

This greater consideration of economic overlap will not be a simple task. In fact, it is likely to be extraordinarily complicated because the economic spillovers will often run in many directions. Taking as initial examples just those issues we have already

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61. Such an election doctrine may, however, discourage sellers from branding individual products with their company names in order to preserve more branding devices.

62. *See, e.g.*, 2B PHILIP E. AREEDA, JOHN L. SOLOW & HERBERT HOVENKAMP, ANTITRUST LAW §§ 560-66 (3d ed. 2008); RUDOLPH J.R. PERITZ, COMPETITION POLICY IN AMERICA 211 (1996).

identified, the scope of both patent and trademark law ought to be informed by the influence of the other. If it is true that brand loyalty can more effectively be established during the patent period, then we might have reason to suspect less trademark protection is necessary for producers to be able to differentiate their products effectively in the post-patent period. Conversely, the greater the scope of trademark protection—both in terms of the number and type of features subject to protection and the entities against whom one can assert trademark rights—the greater a producer's ability to differentiate and price supracompetitively. This suggests that broader trademark protection—and trademark protection has been expanding rapidly over the last half century<sup>63</sup>—obviates some of the need for patent protection, at least for those inventions sold in the consumer marketplace. Copyright protection will also play a role here, sometimes even for the same products. Software, for example, often is protected by both patent and copyright, while various branding elements of the software receive trademark protection. At least in some cases, a company can leverage all three types of IP protection to capture economic benefits, and the interaction of all three forms must be considered.

Despite the challenges in doing so, focusing on the interaction of different IP rights is important because the balance we choose between the various forms of protection will affect the incentives we create, and perhaps the types of inventions we get at the margin. For example, if Parchomovsky and Siegelman are right that trademark leverage allows an inventor to claim greater profits in the long-run, then an IP system that enables such leverage will incentivize firms to produce products for which brand building is most likely to pay off in the post-patent period. Because brand loyalty implies loyalty of consumers, allowing trademark leverage may well affect resource allocation in the direction of more consumer products. In the case of drugs, for example, resources might be directed toward drugs that will be marketed directly to consumers rather than drugs marketed to (or through) hospitals.<sup>64</sup>

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63. See Mark P. McKenna, *The Normative Foundations of Trademark Law*, 82 NOTRE DAME L. REV. 1839, 1896-1915 (2007).

64. Cf. Davis, *supra* note 28, at 14-15 (noting that trademark protection might influence resource allocation towards incremental improvements in existing products rather than to more experimental forms of innovation).

Policymakers need to understand these incentives, determine whether they are desirable, and identify doctrinal tools that might limit any negative consequences before embracing a model that advocates or tolerates leverage.

#### CONCLUSION

This brief sketch of the issues that will be involved in accounting for economic overlap is undoubtedly oversimplified, and there are surely many issues I have not even identified. What I hope this Article has done, however, is to focus our collective attention on firms' ability to employ alternative and complementary appropriation mechanisms, and the failure of IP theory to account for this type of overlap between the various modes of IP protection. Much more work needs to be done to identify the ways doctrinal rules in particular IP regimes impact the need for, and the scope of, other types of intellectual property rights. This needs to be done not only at the feature level of the current channeling doctrines, but at the economic product level—the level at which most appropriation strategies are adopted. As is becoming increasingly clear elsewhere in IP, the effects are likely to be quite different in different markets.<sup>65</sup> In boundary terms, then, this Article is a starting point rather than a finish line. But hopefully it identifies the right track.

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65. See, e.g., DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW COURTS CAN SOLVE IT* (2009) (describing the ways the patent system is perceived differently, and has different costs and benefits, in different industries); Michael W. Carroll, *One For All: The Problem of Uniformity Cost in Intellectual Property Law*, 55 AM. U. L. REV. 845 (2006); Michael W. Carroll, *Patent Injunctions and the Problem of Uniformity Cost*, 13 MICH. TELECOMM. & TECH. L. REV. 421 (2007).