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## INFORMATION COSTS IN PATENT AND COPYRIGHT\*

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### INTRODUCTION

Why do we have more than one form of intellectual property rights? Why are the structures of the patent and copyright forms so different? What determines the optimal structure of each form? The conventional theory of intellectual property rights posits that such rights exist to stimulate the creation and distribution of intellectual goods.<sup>1</sup> Alternatively, theories of personhood justify intellectual property rights on the grounds that they protect objects through which authors and inventors have expressed their “wills,” which is central to self-definition and personhood, or that they create social conditions supportive of creative intellectual activity, which in turn is conducive to human flourishing.<sup>2</sup>

We have developed robust theories to explain why we have the institution of intellectual property rights, but such theories provide a thin basis at best for analyzing the structure of those rights. The bundles of entitlements comprising the patent and copyright forms look quite different from each other and different again from those found in real property. While a theory of incentives and distribution can explain why intellectual property rights exist, it does not really explain, for instance, why patent law prohibits a wider range of behavior than copyright does (copyright law prohibits only copying whereas patent law forbids independent creation as well), why the remedial landscape of patent law is harsher than that of copyright, or why patentees must disgorge information about themselves and their creations in order to receive protection whereas copyright holders need not. Theories of intellectual property based on labor or personhood, however elegant or profound, provide no better traction for answering such questions.

We can begin to answer some of these enduring puzzles and understand the effects of some of the differences between intellectual property forms by examining the presence and distribution of information costs in the propertarian relationship. In this Article, I will explore the relationship between the nature of protected intellectual goods and differences in the structures of patent and copyright. The literature on the law of organizations has recognized that it is most efficient to align the various organizational forms, which differ in structural

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<sup>1</sup> See, e.g., Mark A. Lemley, *The Economics of Improvement in Intellectual Property*, 75 *Tex. L. Rev.* 989, 993 (1997) (“Intellectual property [rights are] fundamentally about incentives to invent and create.”).

<sup>2</sup> See, e.g., Jeremy Waldron, *The Right to Private Property* (1988) (discussing social policies undergirding property rights); Margaret Jane Radin, *Property and Personhood*, 34 *Stan. L. Rev.* 957, 957 (1982) (“[T]o achieve proper self-development . . . an individual needs some control over resources in the external environment.”); see also Georg Wilhelm Friedrich Hegel, *Philosophy of Right* 37–41 (T. M. Knox trans., 1965) (discussing the importance of property to self-actualization).

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ways, with transactions, which differ in their attributes, so as to minimize transaction costs.<sup>3</sup> Similarly, we can achieve real efficiency gains by structuring the patent and copyright forms so as to minimize the information costs presented by intellectual goods.<sup>4</sup> Indeed, patent and copyright rules are influenced not just by incentives to create and distribute goods—they also reflect the demands that different kinds of protected goods place on our ability to process information.<sup>5</sup> I will examine patent and copyright rules because intellectual assets present relatively high information costs and information cost savings matter most when information costs are a large portion of total costs. Nonetheless, some of the observations I will make in this Article are applicable to protected assets and to property rules generally.

Property, like contract and tort, is a body of law devoted to defining the contours of relationships among legal actors. Within these relationships problems of communication, coordination, and comprehension abound. The problem is not merely how to allocate rights to commodities, but how to allocate responsibilities to define and comprehend those commodities. Intellectual property owners, for their part, will know more about their intellectual goods than will nonowners. Nonowners, whom I call observers, will need to learn and comprehend the boundaries and qualities of protected intellectual goods.<sup>6</sup> Observers may also want to learn any number of things, whether pertaining to people or to intellectual goods, in the context of the proprietarian relationship. For instance, observers will need to cognize and mentally process at least enough information to determine where the boundaries of protection lie so as to fulfill their legal duties of avoiding infringement. A smaller set of observers will want to comprehend more completely the attributes of a protected asset so that they can build or improve on it. Or these observers may want to analyze the intellectual property of others so as to make any number of inferences, whether about the protected property or not.<sup>7</sup> In order to do these things, observers must learn two kinds of information: the contours of the proprietarian relationships within which they must navigate, and the nature of the intellectual good—even aspects of the good not protected by legal rules—at the center of this relationship.

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<sup>3</sup> See, e.g., Henry Hansmann, *The Ownership of Enterprise* 21–23 (1996) (providing an overview of transaction costs associated with organizational structures); Oliver E. Williamson, *The Economic Institutions of Capitalism: Firms, Markets, and Relational Contracting* 17 (1985) (same); R.H. Coase, *The Nature of the Firm*, 4 *Economica* 386 (1937) (arguing that transaction costs explain why certain kinds of organizational hierarchies have evolved in certain economic environments).

<sup>4</sup> I am not suggesting that an information cost analysis of patent and copyright law provides a unifying theory of intellectual property, that information costs can explain every difference between the two forms, that legal rules will always have information cost-reducing effects, or that patent and copyright rules will necessarily evolve toward information cost reduction. Despite the common law origins of patent and copyright, we can expect that the ever-increasing complexity of the patent and copyright statutes will, over time, raise rather than lower the information costs of understanding legal rules.

<sup>5</sup> I focus on legal rules pertaining primarily to information *about* intellectual goods as opposed to legal rules primarily concerned with influencing the creation and distribution of intellectual goods themselves, such as the patent and copyright term of protection and copyright's liability rules.

<sup>6</sup> I call nonowners "observers," both because legal rules impose on them a set of duties they are required to observe and because in order to fulfill these legal duties they must seek out information and make observations.

<sup>7</sup> See Clarisa Long, *Patent Signals*, 69 *U. Chi. L. Rev.* 625 (2002) (showing that observers may use patent documents, as well as patent portfolios, to deduce information about patentees).

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A comparative study of the patent and copyright forms of protection reveals that they present various strategies for responding to information costs and coordinating the actions of owners and observers. Consider the following comparison of how legal rules in patent and copyright address the costs of information presented by the paradigmatic assets protected under each form. The attributes and functions of inventions tend to be verifiable, objective, and describable in words and pictures. Legal rules mandate that patent applicants exhaustively describe the attributes of their inventions in order to receive protection. Such rules lower information costs for observers who want to avoid infringing the patentee's rights. The strictly exclusionary nature of the patent entitlement, unbroken by legal privileges or liability rules, creates bright-line duties of avoidance, thereby lowering information costs for observers along the margin of understanding the contours of the proprietarian relationship. Strict liability raises information costs for observers along the margin of complying with the rule, however, because observers must search exhaustively to make sure they are not infringing existing patents. But the functional nature and relatively objective attributes of patented goods, the detailed description owners provide of the protected goods, the experienced nature of the observers, the observers' interest in and tolerance for consuming detailed information about the goods, and the limited number of patented goods that must be avoided all serve to limit information costs.

Copyrighted goods are often easy to create but idiosyncratic to the creator. The ease of creation implies that the pool of such goods will be large, and the ubiquity of copyrighted goods affects large numbers of observers. Any owner may be able to create numerous copyrighted goods. The idiosyncrasy of copyrighted goods and the ineffable nature of much original expression make information about copyrighted goods difficult to convey: two people are unlikely to agree on the meaning of the information, even if it is made public.<sup>8</sup> The owner may have to spend more time describing the good than creating it. Under these circumstances, rules that required exhaustive description and disclosure of the attributes of copyrighted goods would present costs in excess of their benefits for owners and observers alike, and indeed copyright law does not have such rules. Copyright's independent creation privilege reduces if not eliminates the searching that observers would otherwise have to do before they created their own creative works. The requirement that the protected expression be "fixed in any tangible medium . . . from which [it] can be perceived, reproduced, or otherwise communicated," also lowers the information cost burden on observers, because they now have a tangible referent to analyze.<sup>9</sup> Observers may not know the nature of the expression contained in a book, for example, but the physical structure of the book provides boundaries, however crude, for the creative expression contained within.

When legal rules and intellectual property forms do not change, but the kinds of assets that receive protection change over time to present higher information costs, total information costs will increase. As the concepts and boundaries of protected goods become more subjective, observers will have a harder time understanding and obeying their proprietarian duties if

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<sup>8</sup> See, e.g., George A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 Q.J. Econ. 488, 489–92 (1970) (discussing the problem of adverse selection).

<sup>9</sup> 17 U.S.C. § 102(a) (2000).

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legal rules do not accommodate by lowering information costs along other margins. When we move away from protecting paradigmatic items—assets that present the information cost profiles to which the patent and copyright forms are adapted—to protecting nonparadigmatic and more subjectively defined items like business methods or sports moves, observers' net information costs will increase unless legal rules compensate in other ways.

The patent and copyright forms, unfortunately, have not adapted to accommodate the higher information costs presented by nonparadigmatic goods such as software and business methods. If anything, patent and copyright rules have evolved away from mitigating information costs. This evolution may help explain our discomfort with some recent developments in intellectual property law. Because information costs will vary between patent and copyright, we need to consider the effects and sources of information costs in each form before we import mechanisms from one form into another. We should not assume, for example, that just because a particular legal rule achieves a certain welfare outcome in copyright law that it will achieve the same outcome in patent law. If the information costs loom larger in copyright than in patent law, then importing legal rules and information cost reducing mechanisms from one intellectual property form into another may have unexpected consequences.

In Part I of this article, I will explore the various types of information that observers will have to comprehend. I will demonstrate that observers' costs of comprehension are driven by legal rules as well as by the nature of the protected goods themselves. I will then discuss how observers can be divided into several classes. Each class of observers will be interested in learning different things about intellectual goods. In Part II, I will compare how patent and copyright rules respond to information costs. In Part III, I will address some of the implications of examining the informational dimensions of patent and copyright.

### I. OBSERVERS AND INFORMATION COSTS

Problems of comprehension and coordination abound in the proprietarian relationship. To some degree, these imperfections will be irreducible. Despite the best efforts of individuals and the presence of formal and informal rules, property rights remain ambiguous around the edges.<sup>10</sup> We can expect, however, that a property rights system containing legal rules that reduce the information imperfections in these relationships will maximize social welfare more than one that does not. Observers and (to a lesser degree) owners will need to gather and comprehend information. Legal rules can make this task easier or more difficult. In this Part, I show how observers will need to comprehend two different kinds of information: they will need to learn about the contours of the relations created by legal rules, and they will need to learn about intellectual goods-as-goods, independently of the definition of legal rules. I then show why intellectual property presents information costs higher than those presented by real property.

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<sup>10</sup> See Stephan R. Munzer, *A Theory of Property* 24 (1990) (discussing how property rights are unclear at the margins).

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### A. The “Thingness” of Property

Unlike contract law, which has to do with the smallest observable unit of economic activity—the individual transaction—the institution of property is often viewed as being about planning, effort, and investment.<sup>11</sup> From the Legal Realists, we learned—to the extent we did not already know—that the institution of property creates and defines a set of legal relationships between property owners and the rest of the world.<sup>12</sup> According to the standard account, “specialists,” such as lawyers and economists, possess superior sophistication and therefore understand the true nature of the institution of property as intersubjective rather than objective. These specialists have abandoned the simplistic notion that property rights relate to things. Mere layfolk, on the other hand, still retain the naïve (if not “vulgar”<sup>13</sup>) notion that property is about things. According to one account, the specialist “tends both to dissolve the notion of ownership and to eliminate any necessary connection between property rights and things,” whereas laymen think of property as “*things that are owned by persons.*”<sup>14</sup>

As a result of the literature’s emphasis on property rights being a set of relations between people, some commentators have criticized modern property theory—albeit mostly in passing—for leaving the “thingness” out of legal relations.<sup>15</sup> On this view, scholarship on property proper has become so focused on the nature of legal relations that it tends to overlook the fact that these relations revolve around an object or thing. A question is beginning to emerge, or at least to be adumbrated, in the literature: Why do these two conceptions of property proper—those of the layperson and the specialist—continue to coexist? Property specialists have long implicitly assumed that specialists will eventually educate layfolk about the sophisticated conception of property and lay conceptions will evolve accordingly. But this hasn’t happened. Why haven’t layfolk come to think of the institution of property in terms of intersubjective relationships? Why do layfolk insist on grounding property rights in things? Surely the objectivity faux pas would by now have been recognized and discredited, even among layfolk. Why does it prove so durable?

<sup>11</sup> See Carol M. Rose, *The Shadow of The Cathedral*, 106 *Yale L.J.* 2175, 2188 (1997) (criticizing commentary on property rules as based on shadow examples of contract rather than on long-term goals of property).

<sup>12</sup> See Wesley Newcomb Hohfeld, *Fundamental Legal Conceptions as Applied in Judicial Reasoning and Other Legal Essays* 96–97 (Walter Wheeler Cook ed., 1923) (describing his now-famous theory of jural relations).

<sup>13</sup> *United States v. General Motors*, 323 U.S. 373, 377 (1945) (“It is conceivable that [property] was used in its vulgar and untechnical sense of the physical thing with respect to which the citizen exercises rights recognized by law.”).

<sup>14</sup> Thomas C. Grey, *The Disintegration of Property*, in 22 *Nomos: Property* 69, 69 (J. Roland Pennock & John W. Chapman eds., 1980); see also Bruce A. Ackerman, *Private Property and the Constitution* 26–29, 97–100 (1977) (contrasting the definition of property held by the Scientific Policymaker with that of the Ordinary Observer). But see Carol M. Rose, *Property and Persuasion: Essays on the History, Theory, and Rhetoric of Ownership* 2 (1994) (expressing skepticism that layfolk who subscribe to the “thingness” of property are suffering from false consciousness).

<sup>15</sup> See, e.g., Michael A. Heller, *The Boundaries of Private Property*, 108 *Yale L.J.* 1163, 1193 (1999) (“While the modern bundle-of-legal relations metaphor reflects well the possibility of complex relational fragmentation, it gives a weak sense of the ‘thingness’ of private property.”); Jeanne L. Schroeder, *Three’s a Crowd: A Feminist Critique of Calabresi and Melamed’s One View of the Cathedral*, 84 *Cornell L. Rev.* 394, 458 (1999) (“Objects are not, as Hohfeld supposed, irrelevant to property.”); Jeanne Lorraine Schroeder, *Virgin Territory: Margaret Radin’s Imagery of Personal Property as the Inviolable Feminine Body*, 79 *Minn. L. Rev.* 55, 60–61 (1994) (“Generations of legal scholars have repeated Wesley Newcomb Hohfeld’s *faux pas* that property rights do not require a *res*, or object, at all.”).

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Using things as a referent for complex relationships provides a way to reduce information costs. When the subject matter of the property rights is an intellectual good for which information costs loom large, “thingness” becomes even more important. Perhaps the presence of heightened information costs helps explain why intellectual property theory, by contrast with the theory surrounding property proper, has not suffered from a lack of “thingness.” If anything, scholarship in the intellectual property field tends to be acutely conscious that a bundle of information is the thing protected by intellectual property rights, even if intellectual property scholars have not generally framed this recognition in “thingness” terms.<sup>16</sup> As a result, debate has tended to focus on what rules should apply to this asset or that intellectual good, while sometimes overlooking the contours of the legal relations between property owners and observers. The ideal starting point combines both insights: from property proper, a recognition that property rights define legal relations, and from intellectual property, the realization that things—however intangible—are at the center of these relations. Legal rules define the things we will protect and how we think about those things. At the same time, things, intangible or otherwise, have an existence independent of legal rules.

### *B. Sources of Information Costs*

The propertarian relationship requires legal actors to process several different kinds of information. The information that observers will need to process falls into two main categories: the contours of the relations established by legal rules, and the concept of the thing to which the relations apply. These two categories are at least partly distinguishable, although the literature has focused so intensely on property as a set of legal relations that it has overlooked the information costs presented by assets. In this Part, I analyze the cognitive burdens that these two categories of information place on the parties to the relationship. It is not my purpose to determine which interests should be protected or who should be the beneficiary of protection. Rather, I take as a baseline that *some* interests are protected and that patent and copyright law will achieve one of any number of possible allocations of rights and duties between property owners and observers. Once we know how rules and assets impose information costs, we can analyze the implications this has for intellectual property as an institution.

#### *1. The Information Costs of Legal Relations*

Property rules define the contours of legal relations, establishing rights in property owners and correlative duties in observers.<sup>17</sup> In their simplest form, property rights require observers not to infringe.<sup>18</sup> Property rights don’t always take this simple form; they can range from

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<sup>16</sup> But see Timothy P. Terrell & Jane S. Smith, *Publicity, Liberty, and Intellectual Property: A Conceptual and Economic Analysis of the Inheritability Issue*, 34 *Emory L.J.* 1, 25 (1985) (discussing intellectual property and “thingness”). For a statement that intellectual property lacks “thingness,” see Jessica Litman, *The Public Domain*, 39 *Emory L.J.* 965, 971 (1990) (equating intellectual property’s [the asset’s] lack of “tangible qualities” with “intellectual property’s [the institution’s] lack of ‘thingness’”).

<sup>17</sup> See Richard A. Epstein, *Bargaining with the State* 14–15 (1993) (“As far back as Hohfeld, if not before, it has been understood that the creation and recognition of a right or privilege in one person will impose correlative obligations on others.”).

<sup>18</sup> Historically, property rights were defined as an owner having the sole right to exclude others. See Robert W. Gordon, *Paradoxical Property*, in *Early Modern Conceptions of Property* 106–07 (John Brewer & Susan Staves eds., 1995). This conception has become more nuanced over time. See, e.g., Carol M. Rose, *Canons of Property Talk*, or, *Blackstone’s Anxiety*, 108 *Yale L.J.* 601, 615–23 (1998) (discussing the incentive effect of exclusivity).

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simple exclusionary rights to a collection of rights of control over the uses of an asset.<sup>19</sup> Regardless of whether the particular form in question sets forth straightforward duties of avoidance or more complicated governance rules, observers must gather information about the content of legal rules and the scope of their duties with respect to each good. All else being equal, clear rules are easier to learn and understand than vague rules.<sup>20</sup> While clear legal rules can lower information costs along some margins (that of understanding the rule, for example), clear legal rules don't necessarily lower information costs across all margins.<sup>21</sup> Just as comprehending legal rules imposes cognitive burdens, so too does carrying out the duties imposed by property rules. Rules determine what information needs to be learned or disclosed, who needs to learn or disclose it, and the severity of the sanction for failure to learn or to disclose or to act on that learning. A clear rule that requires observers to engage in exhaustive information-gathering may lower the information costs of understanding the rule but raise the information costs of complying with the duties imposed by the rule.

The existence of social norms lowers observers' and owners' information costs about the meaning of rules. Observers' lives are made easier by the fact that there appears to be a widely accepted, if somewhat vague, consensus on the social meaning of private property.<sup>22</sup> As Professor Michael Heller puts it, "When land is sold, sellers, buyers, neighbors, and governments seem to know what constitutes ownership. . . . The same intuitive understanding of property in land may extend to private property more generally. . . . People seem to know private property when they see it."<sup>23</sup> Nonetheless, even if observers will rarely need to learn the social meaning of private property more than once, the precise mix of exclusion and use rules will differ slightly from good to good.

## 2. *The Information Costs of Things*

In addition to incurring the costs of learning about legal rules and carrying out their duties, observers will need to learn about the assets themselves that are the subject matter of the rights. Some of the information costs associated with the things that are the subject matter of property rights are driven by legal rules, but other such costs are not. Objects present information costs to people trying to comprehend them. Observers will need to learn about the at-

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<sup>19</sup> See *Henneford v. Silas Mason Co.*, 300 U.S. 577, 582 (1937) ("The privilege of use is only one attribute, among many, of the bundle of privileges that make up property or ownership."); Henry E. Smith, *Exclusion Versus Governance: Two Strategies For Delineating Property Rights*, 31 *J. Legal Stud.* 453 (2002) (arguing that the modern institution of property includes both rights of exclusion and rights of use).

<sup>20</sup> Vague rules may have other advantages. See Louis Kaplow, *A Model of the Optimal Complexity of Legal Rules*, 11 *J.L. Econ. & Org.* 150 (1995) (discussing some potential benefits of imprecision in legal rules).

<sup>21</sup> See Ian Ayres & Eric Talley, *Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade*, 104 *Yale L.J.* 1027 (1995) (arguing that clear legal rules can impede bargaining, but relying on *in personam* examples to make the point).

<sup>22</sup> See Eirik Furubotn & Svetozar Pejovich, *Property Rights and Economic Theory: A Survey of Recent Literature*, 10 *J. Econ. Literature* 1137, 1139 (1972) ("Property rights assignments specify the norms of behavior with respect to things that each and every person must observe in his interactions with other persons, or bear the cost for nonobservance."); Thomas W. Merrill & Henry E. Smith, *What Happened to Property in Law and Economics?*, 111 *Yale L.J.* 357, 394 (2001) ("Dutyholders simply know to keep out of whatever boundaries—physical or metaphorical—the law or social norms prescribe.").

<sup>23</sup> Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 *Harv. L. Rev.* 621, 660 (1998) (discussing what constitutes private property).

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tributes of an intellectual good to avoid infringing it, to determine whether they want to enter into negotiations with the property owner over it, or to build on it. Observers must also make second-order decisions regarding how much information to collect before making decisions regarding the good.

Any good can be defined as a collection of characteristics or features.<sup>24</sup> A coffee mug may possess the characteristics of cylindricality, heaviness, heat resistance, or any other such collection of features. A widget may possess attributes of size, shape, fuel efficiency, and entertainment value. A book's features can include the information contained in it, the expressive content of that information, the book's physical beauty and quality, and even the status that prominent display of the book confers on the owner. Any characteristic can be defined and comprehended only at some cost, and as a result, neither legal rules nor observers will attempt to define and protect all the characteristics of a good.<sup>25</sup> Some attributes may be easier to define and cognize than others. A widget's size and shape may be easier to cognize than its entertainment value.

To establish the legal boundaries for any good, at least some subset of the good's attributes must be measured and defined. Commentators have argued that property rights will be established, subject to various constraints, in ways that conserve on efforts to reduce definitional costs.<sup>26</sup> Indeed, rules that make the legal boundaries of the good easier to determine *do* lower observers' information costs.<sup>27</sup> We would expect that if legal rules condition property protection on a good possessing certain definable characteristics, the mandated characteristics would be easy to define and measure. In other words, if a good must contain attribute *X* in order to qualify for protection, we would expect attribute *X* to be readily observable. Protected attributes that are easy to recognize and define make it easier for observers to cognize the boundaries of the good. In fact, protecting low measurement-cost attributes of goods is perhaps the very kind of economizing we would *most* expect from property rules. After all, in other areas of law, such as contract, economizing on measurement is paramount.<sup>28</sup> In the case of intellectual property, however, legal rules do *not* in fact require measurement along low

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<sup>24</sup> See Sherwin Rosen & Andrew M. Rosenfield, Ticket Pricing, 40 J.L. & Econ. 351, 357 (1997) (modeling goods as "a bundle of characteristics"); see also Yoram Barzel, Economic Analysis of Property Rights 5 (2d ed. 1997) ("Commodities have many attributes whose levels vary from one specimen to another."); Henry E. Smith, Ambiguous Quality Changes from Taxes and Legal Rules, 67 U. Chi. L. Rev. 647, 649 (2000) ("[C]ommodities and services are bundles of attributes that can vary from specimen to specimen.").

<sup>25</sup> See Yoram Barzel, Measurement Cost and the Organization of Markets, 25 J.L. & Econ. 27, 27 (1982); Roy Kenney & Benjamin Klein, The Economics of Block Booking, 26 J.L. & Econ. 497, 500 (1983).

<sup>26</sup> See Smith, *supra* note 19, at 454 ("[T]hose setting up property rights will . . . tend to set them up in ways that economize on measurement.").

<sup>27</sup> See Wendy J. Gordon, An Inquiry into the Merits of Copyright: The Challenges of Consistency, Consent, and Encouragement Theory, 41 Stan. L. Rev. 1343, 1381 n.181 [hereinafter Gordon, Merits of Copyright] ("Boundaries and demarcation . . . help keep property rights from imposing unanticipated obligations of payment on recipients of benefits."); Wendy J. Gordon, Of Harms and Benefits: Torts, Restitution, and Intellectual Property, 21 J. Legal Stud. 449, 469 (1992) [hereinafter Gordon, Harms and Benefits] ("[T]here must be demarcation; things that trigger obligations of payment must be identifiable in advance and marked as such.").

<sup>28</sup> See, e.g., Alan Schwartz, Relational Contracts in the Courts: An Analysis of Incomplete Agreements and Judicial Strategies, 21 J. Legal Stud. 271 (1992) (noting that contract theory predicts that parties will not condition performance on unobservable or unverifiable factors).

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cost margins. The novelty and nonobviousness of a patented good are difficult to define, as many adjudicators know. Defining creative expression is no better.<sup>29</sup>

Indeed, sometimes intellectual property rights require measurement along fairly high-cost margins. Legal rules define and protect some of a good's attributes but not others. For example, patent rights define and protect the new, useful, and nonobvious aspects of an invention,<sup>30</sup> but not its weight, entertainment value, or shape (although, as I will discuss below, observers may use the invention's weight or shape, say, as a more readily cognizable proxy for its novelty).<sup>31</sup> As another example, copyright protects the expressive content of a book but not its physical characteristics.<sup>32</sup> While it is certainly true that defining and protecting the novel aspects of an invention is a lower-cost margin along which to measure than defining the invention's entertainment value, such margins are still costly. As generations of judges and litigants have learned, novelty is not easy to define and measure. Surely there are lower measurement-cost margins we could protect. But we don't. And novelty is as easy, and as quantifiable, as any of the attributes we do protect.

Consider precisely what it means to define novelty and nonobviousness, two of the three margins along which patent law requires measurement.<sup>33</sup> To say that novelty is a boundary of an intellectual good means that the good is protected to the degree it is new. For example, if the invention is a coffee mug with a square handle, and if the novelty of the mug lies solely in its square handle, then the attribute of the mug that is protected is the squareness of the handle. In order to determine the novelty of an invention, observers complete three mental steps. First, they must comprehend the invention as a concept—not as set of legally defined boundaries (that would be tautological) but as a thing-in-itself. In my example, observers must form a mental conception of what a coffee mug *is*, independently of the subset of attributes patent rules require measurement of. To do this, observers must categorize a coffee mug or conceptualize it as having some set of features. It would be tautological to use only legally measured features, such as novelty and nonobviousness, to define the boundary of novelty. Second, observers must comprehend some set of attributes that comprises their mental con-

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<sup>29</sup> See, e.g., *Chuck Blore & Don Richman, Inc. v. 20/20 Adver.*, 674 F. Supp. 671, 676 (D. Minn. 1987) (“The first axiom of copyright is that copyright protection covers only the expression of ideas and not ideas themselves. . . . The second axiom of copyright is that the first axiom is more of an amorphous characterization than it is a principled guidepost.”). The difficulty of defining boundaries in intellectual property is not a new phenomenon. See *Nichols v. Universal Pictures Corp.*, 45 F.2d 119, 121 (2d Cir. 1930) (“Nobody has ever been able to fix [the idea/expression] boundary, and nobody ever can.”).

<sup>30</sup> 35 U.S.C. §§ 101 (utility), 102 (novelty), 103 (nonobviousness) (2000).

<sup>31</sup> See Barzel, *supra* note 25 (discussing proxies); Steven N.S. Cheung, *The Contractual Nature of the Firm*, 26 *J.L. & Econ.* 1, 1–16 (1983) (same); Smith, *supra* note 19 (same).

<sup>32</sup> 17 U.S.C. § 106 (2000) (copyright holders have the right to prevent others from copying the good but not to prevent others from observing it without making a copy).

<sup>33</sup> I do not consider utility here because it is an all-or-nothing criterion. If a good has any legal use—and it is almost impossible to find a good that does not meet the definition of utility as interpreted by the Patent and Trademark Office—then the good is patent-eligible. Even if an inventor discloses only one use for an invention, all uses of the invention not previously known, and even those still unknown at the time the patent is granted, may be protected. For example, if inventor *A* is granted a patent for “compound *X*” without restrictions and states that compound *X* is useful for dyeing cloth (but does not limit the claims to this use), a later discovery by inventor *B* that compound *X* can also be used to treat cancer is a protected use under inventor *A*'s patent. Operating thus, utility is a low measurement cost margin, but not one that draws helpful distinctions. Novelty and nonobviousness are more selective criteria.

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ception of the prior art. Observers must decide what things a coffee mug is most like and categorize it accordingly. Once again, observers must comprehend a large bundle of attributes. Finally, observers must compare the mug-as-a-thing to the prior-art-as-things. If there is a gap between the two, however small (in my example, a square handle), that gap is what we call novelty.

Nonobviousness is an even higher margin along which to measure. The nonobviousness inquiry asks, in essence, whether the invention has some indefinable and ineffable, but sufficiently large, quantum of difference between it and the prior art. A coffee mug with a square handle may be new, but is it sufficiently different from all the coffee mugs that went before it to deserve patent protection? To answer this question, observers must complete the same three mental steps as they do for novelty, with one variation. Once again, they must comprehend the invention-as-a-thing, define the relevant bundle of attributes that comprises the prior art, and draw a comparison between the two. This time, however, they must determine whether the gap between the bundle of attributes that comprises their mental model of the mug-as-a-thing and the bundle of attributes that comprises the prior-art-as-things is large enough to trigger protection. In order to be nonobvious, an invention must possess some undefined quantum of difference between it and the prior art. The size of the gap is the degree to which the invention is nonobvious. It is hard to think of a higher measurement-cost margin than this.<sup>34</sup>

Why don't rules protect easily comprehensible attributes? If we are so concerned with defining and protecting assets along low-cost margins, then why do intellectual property rights protect the attributes of novelty, utility, and nonobviousness for inventions and creative expression for artistic works? Information costs are but a part—although a key part—of a larger landscape. Legal rules must balance the goal of reduction of information costs with other social values. Contract is concerned with minimizing the costs of transacting between parties. Property's goals are larger. Rules regarding the allocation and distribution of intellectual goods, and rules regarding the allocation and distribution of information *about* intellectual goods, sometimes come into conflict. If one goal of intellectual property rights is efficient creation and distribution of goods, the rules necessary to achieve those goals will not always

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<sup>34</sup> Some commentators, frustrated with the high measurement costs of the patent system (although they do not always frame their frustration in such terms), have proposed research contests as a way of measuring inventions along lower-cost margins than novelty and nonobviousness. See, e.g., Richard L. Fullerton et al., *Using Auctions to Reward Tournament Winners: Theory and Experimental Investigations*, 33 *RAND J. Econ.* 62, 63 (2002) (arguing that “verification and enforcement problems can hamper the effectiveness” of patent races and research and development contracts “whenever success is based on a measurement of innovation quality”). In a research contest, a reward is given to the innovator who presents the “best” creation from among all the entrants on a particular date. See Richard L. Fullerton et al., *An Experimental Investigation of Research Tournaments*, 37 *Econ. Inquiry* 624 (1999) (presenting laboratory evidence regarding efficiency and research tournaments); Curtis R. Taylor, *Digging for Golden Carrots: An Analysis of Research Tournaments*, 85 *Am. Econ. Rev.* 872 (1995) (examining how to maximize the efficiency of a research tournament). A research contest reduces the measurement costs of determining innovation quality along some margins by judging the entries relative to each other rather than measuring the absolute quality of the innovation. Even so, it does not give guidance in determining how to measure quality, even in relative terms. Other commentators, recognizing this, have proposed that research contests can reduce the measurement costs of the quality of the entrants by limiting the number of competitors to two and by holding an auction to determine which contestants will compete in the research contest. See, e.g., Richard L. Fullerton & R. Preston McAfee, *Auctioning Entry into Tournaments*, 107 *J. Pol. Econ.* 573 (1999) (treating auctions as a way to reduce what are essentially information costs).

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be the ones that make transmission of information about the good easy. We protect novelty, nonobviousness, creative expression, and other such boundaries in an attempt to secure expectations regarding investment and planning, to create incentives for the development of resources,<sup>35</sup> and to assure that inventors and creators do not duplicate each others' work.<sup>36</sup> We should not be surprised to see concerns regarding information about goods trumped in the clash with other social values which can only be achieved by protecting attributes along such high-cost margins as novelty, nonobviousness, and creative expression.<sup>37</sup> This helps explain why intellectual property rights protect attributes that are so hard to define, and why changing the rules to protect attributes that are easy to comprehend and define would not necessarily be more efficient.

A simple information cost theory would predict that owners will attempt to measure the goods in question only along those margins mandated by intellectual property rules. But when the goods in question are protected by intellectual property rules, cognizing the legally protected margins of novelty and nonobviousness will require observers to go through multiple steps of measurement. Unsurprisingly, many observers will not find it worthwhile even to measure up to the point that legal rules demand, since doing so will require spending cognitive resources in excess of many observers' willingness to pay. In other words, many observers can be expected to attempt to economize on information costs by comprehending the assets protected by intellectual property rights as things-in-themselves, rather than measuring the attributes that legal rules demand. Many observers will not get to the end of the inquiry, "what makes this thingamabob new and nonobvious?" Instead, because observers must have a concept of what the invention generally is before they can ask what makes it new and nonobvious, most observers will start by asking, "what is this thingamabob?" Even if the good can be placed in a familiar category, such as a coffee mug, many observers simply will not care what is new and nonobvious about it. Nor will many observers bother to get far enough in the inquiry to define exactly what legally protected creative expression is contained in a painting, music, book, software, or digital file.

### *C. Familiarity and Reductionism*

Not all assets that are the subject of property rights present the same information cost profiles. Instead, the nature of the asset and the legal rules pertaining to it will determine the kind of information costs imposed on observers. Consider real property. Because real property is tangible, the avoidance costs surrounding it are relatively low. Trespass requires

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<sup>35</sup> See, e.g., Rose, *supra* note 18, at 626 (explaining that the utilitarian justification of property rights is based on promoting planning, investment, and trading); Joseph L. Sax, *Liberating the Public Trust Doctrine from Its Historical Shackles*, 14 U.C. Davis L. Rev. 185, 186–87 (1980) ("The essence of property law is respect for reasonable expectations. The idea of justice at the root of private property protection calls for identification of those expectations which the legal system ought to recognize."); Cass R. Sunstein, *On Property and Constitutionalism*, 14 Cardozo L. Rev. 907, 911–13 (1993) (describing the function of property rights as promoting stability of expectations and creating incentives for the development of resources).

<sup>36</sup> See *Feist Publ'ns v. Rural Tel. Serv. Co.*, 499 U.S. 340, 349 (1991) (noting that copyright's primary purpose is "not to reward the labor of authors, but '[t]o promote the Progress of Science and useful Arts'" (quoting U.S. Const. art. I, § 8, cl. 8)).

<sup>37</sup> See Rose, *supra* note 11, at 2197–98 (asserting that information-forcing matters most in contract, whereas incentives for investment are most important in property).

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physical intrusion, and fences or other such markers indicate boundaries in a way that is usually easy to interpret. Observers do not need to understand the attributes or qualities of the land, other than its physical boundaries, to fulfill their duties of avoidance. If Franny the property owner tells Jerry the observer, “don’t trespass on my land,” Jerry knows he should stay away physically from the marked land. Granted, not all boundaries are as unmistakable as a fence. Fixing boundaries in the context of nuisance disputes can be quite difficult.<sup>38</sup> Most of the contexts in which Jerry has to identify boundaries, however, will not be so difficult.

The familiarity of the concept of land lowers information costs for observers.<sup>39</sup> Early in life, people learn the concept of land-as-a-thing, so by the time they encounter legal relations involving real property they only need to learn about the nature of legal rules and the boundaries these rules impose. Although each parcel of land is unique, real property law can reduce information costs for observers by codifying existing customs and social relations.<sup>40</sup> Social norms also underlie boundary markers such as fences. Jerry can figure out the social meaning of a fence on Franny’s land without too much mental effort. Because the concept of land-as-a-thing is familiar, the market value and optimal uses of land are more transparent and less likely to be emergent over time. These conditions lower the need for legal rules that make it easy for observers to determine the physical boundaries of the land.

For observers who wish to enter into transactions regarding the land, determining characteristics of the land other than its boundaries also presents relatively low information costs. If Jerry wants to negotiate with Franny to buy her land, he can hire land evaluation experts who will know what characteristics make a piece of land valuable. Legal rules forcing Franny to describe her land (other than its boundaries) are likely to create greater costs for Franny than benefits for the rest of the world. This is not to say that information cost-reducing rules are unimportant in the case of land. Rather, rules making it easy for Jerry to comprehend what Franny means when she says, “don’t trespass on my land” are less important than they would be if it were difficult to determine what Franny meant when she said “land,” how Franny’s land was protected, what actions constituted trespass, and what purpose a fence served.

Compare land with intellectual property. Information costs are more significant in intellectual property than in real property and personal property law. Because they are intangible, determining and measuring the boundaries of intellectual goods are more difficult than determining and measuring the boundaries of real property.<sup>41</sup> As a result, avoidance costs will

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<sup>38</sup> See Thomas W. Merrill, *Trespass, Nuisance, and the Costs of Determining Property Rights*, 14 *J. Legal Stud.* 13 (1985) (arguing that differences in transaction costs can help explain doctrinal differences between trespass and nuisance).

<sup>39</sup> See Kenneth R. Minogue, *The Concept of Property and Its Contemporary Significance*, in 22 *Nomos: Property*, supra note 14, at 3, 11 (“[P]roperty is the concept by which we find order in things. The world is a bundle of things, and things are recognized in terms of their attributes or properties.”).

<sup>40</sup> See Richard A. Epstein, *International News Service v. Associated Press: Custom and Law as Sources of Property Rights in News*, 78 *Va. L. Rev.* 85, 85 (1992) (“In opposition to Austin stands an alternative view that grounds property rights on the traditions and common practices within a given community. On this view, property comes from the bottom up, and not from the top down.”).

<sup>41</sup> See Richard A. Epstein, *Property Rights in cDNA Sequences: A New Resident for the Public Domain*, 3 *U. Chi. L. Sch. Roundtable* 575, 576 (1996) (“[I]t is much more difficult to define the scope of a patent than the boundaries of a parcel of land, the confines of a piece of wood, or the body of a fox.”).

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generally be higher. Unlike land, determining the protected boundaries of an intellectual good involves measuring more attributes than just its outline. Observers must decipher qualitative aspects of the intellectual good in order to know what is protected and what is not. Intellectual goods will frequently have variable and unpredictable values and uses.<sup>42</sup> Some intellectual goods will be harder to comprehend than others, regardless of whether most of their attributes fall in the realm of private property or in the commons.<sup>43</sup>

Observers' lack of familiarity with the protected asset is more likely to be a problem with intellectual goods. The goods protected by intellectual property rights will usually not have accumulated a patina of social meaning that reduces information costs for observers. Intellectual goods, by their very nature, are new and original creations and will present particularly high information costs at the start of their term of protection. Whereas everyone knows what land is, observers often must learn about intellectual goods unaided by longstanding customary definitions, communal norms, or widespread social understandings about their meanings and boundaries. Information about the optimal uses of intellectual goods will often emerge over time. This is particularly true when the asset is idiosyncratic and newly created, such that information about it, especially when rights are first granted, is thin. Consider a situation in which there is a thin market for a particular asset protected by property rights, such as in the relationship between a patentee and an improver or between a copyright holder and the producer of a derivative work. Rules that prevent property owners from withholding information about the asset's attributes allow observers to analyze asset quality and reduce information asymmetries between property holders and observers. When the asset in question is one that has variable and unpredictable value over time, highly specific and detailed use rules are unlikely to be efficient.<sup>44</sup>

Familiarity with the general categories of things into which we place new objects provides a lens through which to comprehend the things that are protected by property rights. Each parcel of land is unique, but the thing we call "land" is the only kind of thing encompassed within the various forms of real property rights. By contrast, many different kinds of things—indeed "anything under the sun that is made by man"<sup>45</sup>—are encompassed within the forms of intellectual property. Thus the variance in the idiosyncrasy of intellectual goods across all specimens can be expected to be greater than the variance in the idiosyncrasy of land across all parcels. This will make categorization and definition of new intellectual goods harder.

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<sup>42</sup> On the heterogeneity in the value of patents, see Wesley M. Cohen & Richard C. Levin, *Empirical Studies of Innovation and Market Structure*, in 2 *Handbook of Industrial Organization* 1059, 1062–64 (Richard Schmalensee & Robert D. Willig eds., 1989).

<sup>43</sup> No good is ever wholly in the commons or wholly in the private domain, but which of the good's attributes are protected does not affect its nature as a thing-in-itself. *Moby Dick*, as a work of literature, does not become easier to comprehend as a thing-in-itself by being in the public domain.

<sup>44</sup> Similarly, when an organization's future decisions cannot be specified in advance in a legally binding way, either because they are unverifiable or prohibitively costly to specify in advance, the parties will leave contractual terms open, to be filled in as events unfold. See Oliver Hart, *Firms, Contracts, and Financial Structure* 2 (1995) (noting that it is impossible to specify all of an organization's future decisions in advance in a legally binding way); Sanford J. Grossman & Oliver D. Hart, *The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration*, 94 *J. Pol. Econ.* 691 (1986) (same); Oliver Hart & John Moore, *Property Rights and the Nature of the Firm*, 98 *J. Pol. Econ.* 1119 (1990) (same).

<sup>45</sup> *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (internal citations omitted).

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Consider patented inventions. If Franny tells Jerry, “don’t infringe my patented coffee mug,” it’s not sufficient for Jerry merely to know what this invention called a “mug” is. If he doesn’t know what a mug is, figuring this out entails information costs. Because patented inventions are by definition new, Jerry frequently will have to incur costs simply to understand the invention-as-a-thing. But this is not enough. To avoid infringing, Jerry must determine precisely what characteristics of the mug are legally protected. Can Jerry fulfill his duties of avoidance by using an identical mug with a different handle? Can he avoid infringing by using an identical mug made out of metal rather than ceramic? Is the shape of the mug a protected attribute? There is no universally understood sign, like a fence, that informs the world of the boundaries of the intellectual good. Legal rules that force Franny to disclose information about the invention (here, a mug) can help Jerry by reducing his information costs. And these are precisely the kind of legal rules that occupy so much of patent law. Rules requiring patentees to provide an adequate written description of the invention, rules setting out the way in which the patent document itself must be written, and rules mandating that patentees disgorge detailed information about precisely what about the mug is new, useful, and nonobvious all help make it easier for observers to avoid infringing.<sup>46</sup>

Intellectual goods are likely to present lower information costs when they can be categorized with other qualitatively similar goods. For example, suppose that an observer has never before encountered a cotton gin and cannot even categorize it into a pre-existing set of objects. Or suppose the best the observer can do is categorize the cotton gin as a machine. Such a categorization is helpful, but it doesn’t get him very far. He knows what a machine is, but knowing what a machine is doesn’t much help him cognize a cotton gin. Seeing the tangible embodiment of a cotton gin, or a picture of the tangible embodiment of the cotton gin, is a low-cost way of cognizing the concept of the gin-as-a-thing. Recall that legal rules do not protect the tangible embodiment of the gin. Rather, they protect the novel and nonobvious aspects of the bundle of information to which we have attached the label “cotton gin.” Similarly, observers can more easily cognize an object once they have categorized it as a book. If observers can identify a protected object as a book, the familiarity and social meaning surrounding the concept “book” reduce information costs for observers. Note that observers do not engage in the process of classifying the object as a book because they are required to do so by legal rules. Instead, they do so purely to reduce their own cognitive expenditures. It is the exceptional observer who will attempt to define and measure the creative expression contained in the book, but the tangible embodiment of the protected expression helps observers cognize the protected object. Observers will not always go so far as to define the protected expression, and so they would not know the precise legal margins of protection, but at least they know that legal rules mandate that they not copy the material appearing between the book’s covers, whatever that material is.

The functional nature of inventions helps lower the information costs of understanding patented assets. Observers can conserve on information costs by reducing the concept of an invention to its function. A coffee mug reduces to a container for holding coffee. A cotton gin can be cognitively reduced to a machine that separates the seeds from the boll of the cotton

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<sup>46</sup> See 35 U.S.C. § 112 (2000) (requiring that an inventor provide a written description of the invention).

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plant. Observers who merely wish to avoid the good, as opposed to buying it or using it themselves, don't need to gather more information about the goods. Such reductionist proxies are relatively objective and measurable. Reductionism is a way of winnowing a potentially large amount of information down to a cognitively manageable chunk. Because, on average, most patented goods are harder to create than most copyrighted goods, there are fewer patented goods to cognize.

Another factor lowering the information costs presented by paradigmatic patented goods is the specialized nature of the type of observers reasonably likely to infringe.<sup>47</sup> Once observers have categorized or classified the patented good by reducing it to its function, they can then decide whether they need to incur further information costs regarding the good. Relatively few observers are likely to make paradigmatic patented goods without permission of the owner. Unless an observer is in the cotton growing industry, for example, he or she is unlikely to make, use, or sell a patented cotton gin without permission from the patent owner. Even if the paradigmatic good is one that is more ubiquitous in commerce than a cotton gin, such as a coffee mug, the class of observers realistically likely to infringe is small.<sup>48</sup> Patented nonparadigmatic goods such as business methods or sports moves, by contrast, affect a larger number of observers. Inclusion of nonparadigmatic goods, which can affect large numbers of observers, in the kinds of goods that can be patented raises total information costs. Failure to search can expose observers to liability unwittingly, but most of the resulting inadvertent infringement is unlikely to diminish the patentee's profits. When the class of potential infringers is large and unwitting infringement is easy, rules that impose strict liability for infringement with no exceptions (as in patent law) impose information costs on individuals past the point of diminishing marginal returns.

Copyrighted goods, by contrast, are valued for their expressive rather than functional content. Reductionism is less helpful for reducing the information costs of expressive goods. Social agreement on the expressive content and meaning of a copyrighted work will be harder to reach than social agreement on the function of a patented good, and social meaning is an

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<sup>47</sup> See Henry E. Smith, *The Language of Property: Form, Context, and Audience*, 55 *Stan. L. Rev.* 1105, 1174 (2003) (stating that "the users of inventions themselves are specialists in the relevant area of technology and can be expected to be able to process the information that the patent law requires to be disclosed in the patent application process").

<sup>48</sup> Buyers of infringing goods are liable for infringement as well if they use the good in a way that infringes the patent. Suits by patentees against end consumers rather than manufacturers, however, are rare. See Roger D. Blair & Thomas F. Cotter, *An Economic Analysis of Seller and User Liability in Intellectual Property Law*, 68 *U. Cin. L. Rev.* 1, 4 n.10 (1999) (showing that five of 1340 patent cases involved allegations solely of unlawful sale or use, rather than of unlawful manufacture of the patented good, and none of those were brought against end consumers). The reasons for this disparity are both financial and legal. The number of infringing end consumers can be very high and the expected damages of each suit low. *Id.* at 3 n.9. End consumers of the infringing good may also be consumers of the patentee's goods, so the patentee may be alienating members of its own client base. On the legal side, several factors undoubtedly minimize the number of suits brought against end consumers. First, mere possession or purchase of an infringing good, without more, does not constitute prohibited use by the purchaser. See 35 U.S.C. §271 (giving patentees the right to prevent others from making, using, selling, or offering to sell the patented item). Similarly, use of a patented good in a way that is not protected by the patent does not constitute infringement. A patentee suing an end consumer would have to prove the consumer actually used the protected good, and did so in an infringing manner. Even if the patentee can prove infringing use by the end consumer, the patentee's damages are likely to be limited. Defendants are usually not liable for damages until they are put on notice, at which point they become liable only for damages arising from post-notice infringement. See *id.* §287.

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information-cost reducing mechanism.<sup>49</sup> What is the concept of *Moby Dick* or a Jackson Pollock painting? How can that concept be conveyed from property owners to observers? To the extent copyrighted goods can be reduced to proxies, the proxies are either too general to be very helpful—*Moby Dick* is a book; Jackson Pollack's *Eyes in the Heat* is a painting—or else they tend to be subjective and ineffable. It simply is harder to define the creative expression contained in most copyrighted goods. Because copyrighted goods are so easy to create, there are far more copyrighted goods to avoid than patented goods. While not everyone is reasonably likely to encounter (let alone infringe) paradigmatic patented goods, most people are likely to encounter copyrighted goods.<sup>50</sup> Items subject to copyright protection are ubiquitous throughout modern society and easy to create (and recreate). The size of the class of observers reasonably likely to infringe copyrighted goods, however unwittingly, is relatively larger than the class reasonably likely to infringe patented goods. Because of the subjective content, easy creation, and ubiquity of copyrighted goods, the total information costs imposed by such goods will be significant.

#### *D. Avoiders, Transactors, and Builders*

People are sensitive to the mental effort required to process information and are vigilant about economizing on it, just as they would any scarce resource.<sup>51</sup> Rational individuals will only collect and mentally process such information up to the point where the marginal benefit of doing so equals the marginal cost.<sup>52</sup> In general, observers will attempt to economize on the information costs involved in comprehending the contours of legal relations established by intellectual property rights and the things to which those relations pertain. Not all observers will have identical interests in the context of the proprietarian relationship, nor will they share the same tolerance for incurring information costs.<sup>53</sup> Observers will want to comprehend a

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<sup>49</sup> But see Smith, *supra* note 47, at 1175 (stating that “the delineation of a copyright is much simpler and easier to grasp by a lay audience than the delineation of a patent”).

<sup>50</sup> See *id.* at 1175 (stating that in copyright “almost anyone can be a producer of violating material simply by illegal copying”).

<sup>51</sup> See Kevin Lane Keller & Richard Staelin, Effects of Quality and Quantity of Information on Decision Effectiveness, 14 J. Consumer Res. 200, 212 (1987) (concluding that too much information causes individuals to experience “information overload”). Observers’ costs may vary from individual to individual, depending on a number of factors, not least of which is a person’s “need for cognition.” Individuals who have a high need for cognition (“chronic cognizers”) tend to gather more information, incur higher search costs for information, engage in greater mental processing of information, and consequently incur greater information costs than those low in need of cognition (“cognitive misers”). See John T. Cacioppo et al., Dispositional Differences in Cognitive Motivation: The Life and Times of Individuals Varying in Need for Cognition, 119 Psychol. Bull. 197, 237–38 (1996) (“[P]eople high in need for cognition engage in greater information-processing activity than people low in need for cognition.”); Bas Verplanken, Need for Cognition and External Information Search: Responses to Time Pressure during Decision-Making, 27 J. Res. Personality 238, 240 (1993) (“Individuals high in need for cognition (NC), compared to low-NC individuals, tend to scrutinize information to a greater extent, and base their attitudes on issue-relevant thoughts rather than on peripheral cues. . . . [They] are motivated to expend more effort on cognitive tasks than are low-need-for-cognition individuals.”).

<sup>52</sup> See Richard A. Posner, The New Institutional Economics Meets Law and Economics, 149 J. Institutional & Theoretical Econ. 73, 85 (1993).

<sup>53</sup> Concerns with the nature and interests of the audience explains the approaches taken by Professors Thomas Merrill and Henry Smith, and by Professors Henry Hansmann and Reinier Kraakman, to the information problems presented by forms of property proper. Merrill and Smith have argued that property rights come in a limited number of standardized forms and that standardization of forms helps third parties identify the nature of the entitlement held by the property owner. See Thomas W. Merrill & Henry E. Smith, The Property/Contract Interface, 101 Colum. L. Rev. 773, 777–79 (2001) (explaining property and contract law in terms of the information costs of in rem and in personam rights);

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protected intellectual good for any number of reasons, not just avoidance. Some observers will have only a passing interest in an asset protected by property rights; others will be intensely interested.<sup>54</sup> The indifferent and the interested will differ not only in the degree to which they will gather information, but also in the type of information they will gather.

Although in theory property rights are good against “the rest of the world,” in practice observers will not include all legal actors other than the property owner.<sup>55</sup> Many if not most legal actors, although formally under a duty not to infringe, are so far away—either literally or metaphorically—from the intellectual good that their legal duties with respect to the property are irrelevant. They don’t know about the good and couldn’t care less. Consider them nonobservers. When I talk about observers, therefore, I am referring to people or entities who are likely to encounter the property, either literally or figuratively, or to work in the same field. For example, the relevant class of observers of a patented component of a computer chip is very small. While theoretical observers include all legal actors, practical observers are people in the industry that makes the chip (and most likely just a subset of those people), since people outside the industry are unlikely to duplicate or create a similar chip on their own. The relevant observers of a copyrighted videogame are users and sellers of the videogame. While the number of users of a videogame is almost certainly larger than the number of engineers working in the chipmaking industry, it is still a much smaller subset than the number of people who comprise “the rest of the world.”

All observers have at least one thing in common: Property rights place duties on all observers to avoid infringing the subject matter of the rights. This in turn requires that all (practical) observers take in at least enough information to understand, however vaguely, what asset they are supposed to avoid. There the similarity of interests among observers ends. I classify observers into three categories based on their motivations. First are those who merely wish to avoid infringing the property owners’ rights and have little interest in comprehending the good beyond those boundaries. These people are “avoiders.” We might even call them

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Thomas W. Merrill & Henry E. Smith, Optimal Standardization in the Law of Property: The *Numerus Clausus* Principle, 110 Yale L.J. 1, 3–9 (2000) (explaining that standardized forms of property reduce transaction costs). New forms of property are suspect because they raise information costs to third parties; creators of new forms, or “fancies,” are not internalizing the externalities of their creations. See *id.* at 8, 27–28 (“The existence of unusual property rights increases the cost of processing information about all property rights. Those creating or transferring idiosyncratic property rights cannot always be expected to take these increases in measurement costs fully into account.”). Hansmann and Kraakman acknowledge that property relations present information problems, but they challenge the idea that property forms come in discrete packages to reduce information costs. Instead, they maintain that the key information problem is verification of ownership. So long as potential purchasers can identify owners and verify the nature and extent of the owner’s rights, they argue, owners should be allowed to create idiosyncratic entitlements. See Henry Hansmann & Reinier Kraakman, Property, Contract, and Verification: The *Numerus Clausus* Problem and the Divisibility of Rights, 31 J. Legal Stud. 373 (2002) (arguing that the *numerus clausus* doctrine aids verification of ownership rather than serving to standardize property forms). The Merrill/Smith thesis that having a limited number of forms reduces information costs and the Hansmann/Kraakman thesis that verification is the key information problem are both plausible because each set of authors is looking at a different type of observer. Merrill and Smith’s observers are avoiders, who are interested merely in not infringing others’ rights, whereas Hansmann and Kraakman have in mind transactors, who are interested in consuming the good.

<sup>54</sup> See, e.g., Long, *supra* note 7 (showing that the degree to which different observers will gather information about patents will depend upon their interests).

<sup>55</sup> See Smith, *supra* note 47, at 1173–77 (“[S]ome rights that are *in rem* are in practice addressed only to a proper subset of the members of a given society.”).

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“casual avoiders” because we can expect them to economize on cognitive resources fairly rigorously, at least with respect to the question of which goods are protected and what duties legal rules impose. Second are “transactors,” who wish to transact with owners of goods, either to consume the good or to enter into some other contractual negotiation. Finally, there are “builders”—those observers who, in addition to fulfilling their legal duties of avoidance, *do* wish to comprehend the good in greater detail because they are interested in building on it or inventing around it. These categories are merely meant to represent rough groupings of the kinds of interests observers will have. Any given observer can belong to more than one category, and we can think of observers who fit into none of these categories, such as deliberate or indifferent infringers.<sup>56</sup>

Avoiders aren’t in the market for consuming the good (if they were, they would be transactors), and they don’t care what the good is or does. If the intellectual good is a computer program, they don’t care about its features. If it is a book, they don’t care about its plot, characters, or economic value. They are not interested in learning most of the qualitative aspects of the good. Instead, they are interested only in information about the good—and only in a subset of that. Specifically, they will be interested in learning just enough about the good not to infringe. We would expect avoiders to be the greatest cognitive misers, learning only enough information to determine the legally protected boundaries of the good, and perhaps not even that much. A typical avoider—say an individual downloading MP3s from the Internet (to the extent MP3 users as a class can even be considered “avoiders,” much less “typical avoiders”)—may want to know only whether the particular MP3 file is protected by copyright or not, and will want to know just enough about the bundle of information (the file) to categorize it as a particular song, for example. Such an individual is unlikely to care what elements of the song are protected, how thick the protection is, or who owns the rights to the song.

This does not mean, however, that avoiders will attempt to understand the legal definition of the good. Understanding the legal definition of the good would require observers to measure the good along legally protected margins. When avoiders try to comprehend the asset, they will use proxies for the legally protected attributes of novelty, utility, and nonobviousness (in the case of an invention) or creative expression (in the case of a copyrighted work). In other words, mere casual avoiders will not ask themselves, “What are the legally protected attributes of this good?” Even legal specialists who are casual avoiders will not ask, “What makes this good new, useful, and nonobvious?” or “What is the creative expression contained in this thing?” Instead, they will ask, “What is this good?” Because novelty and nonobviousness (in particular) in patent law and creative expression in copyright are such high-cost margins along which to measure a good’s attributes, and because they require measurement along other margins as a prerequisite, we can expect avoiders to use quick and dirty proxies of these factors for avoidance purposes. One proxy for protected margins is the tangible embodiment of the good itself. Observers may not know precisely what expression is contained in a book, but its tangible embodiment—the pages between covers—provides rough proxies

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<sup>56</sup> See, e.g., Lior Jacob Strahilevitz, *Charismatic Code, Social Norms, and the Emergence of Cooperation on the File-Swapping Networks*, 89 Va. L. Rev. 505, 533 (2003) (discussing the existence of widespread copyright infringement of music and audiovisual works).

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for the legal boundaries of what is protected. Another proxy is categorization. Rather than attempting to determine the legally protected attributes, casual avoiders will often find it sufficient to categorize the good mentally to conform to pre-existing categories: “this is a song” or even “that is some little thingamabob that I have no interest in.” Because avoiders will economize on information costs, they will not gather more information about the good than the amount that allows them to identify and avoid the good. Legal rules that force detailed disclosure of information about the good will not benefit avoiders. The cost of gathering and processing such fine-grained information, even if it is readily available, will exceed the marginal benefits for avoiders.

Transactors are interested in transacting over the good. They will be more tolerant of information costs because their interests will require them to pay greater attention to the characteristics of the good. They will be interested in learning about more qualities of a good than just its boundaries, such as its price, what the good does, and how it differs from other such goods. For the majority of observers (avoiders), it will be less important to know who owns something than to know what is owned. Transactors, however, are interested both in the “what” and in the “who”: the “what” because they need to gather enough information to determine what the good is and whether they wish to consume it, and the “who” because they need to ascertain the identity of the owner. It is for this class of observers that rules lowering the information costs associated with verifying ownership will be most beneficial.<sup>57</sup> Transactors are less likely to be experts in the field than builders are, so they will be less interested in technical information. Transactors can also be, or turn into, builders by developing the good into a new product after purchasing or licensing it.

Builders will be willing to spend the greatest amount of cognitive resources of any of the three categories of observers and will have the greatest tolerance for detailed and complex information. Builders will be interested in the good itself, as well as information about the good.<sup>58</sup> They will be interested in what the good is and does because they want to build on it or innovate around it. Builders are the observers most interested in determining precisely what makes an invention new or how thick the protection is for a creative work. As a result, they are the most likely to attempt to comprehend the nature of intellectual goods along legally protected but costly-to-measure margins such as novelty, nonobviousness, and creative expression. Indeed, builders are the most likely to benefit from rules that require property owners to engage in detailed disclosure of information about the good. The marginal benefits to builders of determining the contours of legal relations and the nature of the good will be highest relative to other classes of observers.

Not all kinds of information-cost reducing rules will be equally effective. The effectiveness of the rule depends in part upon the motivations and interests of the parties subject to such rules. A rule that forces owners to define property rights past a point that observers care about may in fact be inefficient. If the vast majority of observers are avoiders, then rules

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<sup>57</sup> See Hansmann & Kraakman, *supra* note 53 (discussing the costs of verifying ownership).

<sup>58</sup> Builders may also be transactors. One of the differences between builders and transactors is that transactors interact with the owner of the good or the owner’s agent, whereas builders gather information without contact with the owner or agent.

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mandating that owners describe qualities of the good that do not assist observers in avoiding the good may be inefficient. They only *may* be inefficient because the net benefit to other classes of observers, such as transactors or builders, who are interested in consuming or reverse engineering the good may be greater than the net costs to property owners and avoiders from having to disgorge and process more information. Rules attempting to deal with information cost problems should be tailored to the needs of different classes of observers.

## II. STRATEGIES IN PATENT AND COPYRIGHT

Information costs loom large in property law generally, and even more so in intellectual property. Because the nature and sources of information costs will vary with the protected good, legal rules will be most efficient when they respond to the specific kinds of information costs presented by different goods. There are many strategies legal rules can use to reduce information costs. In this Part, I examine how legal rules address information costs in patent and copyright law, and explore some of the different strategies the patent and copyright forms employ. One strategy is to allocate costs by splitting informational burdens between property owners and nonowners, or distributing informational burdens intertemporally. Another strategy is to vary the duty to search for and comprehend information, and the severity of the sanction placed on observers, with the level of information costs presented by intellectual goods. Finally, legal rules can lower information costs by limiting the form or appearance of the good that receives protection.

### *A. Cost-Allocating Strategies*

Information costs and the difficulty legal actors encounter in comprehending information in the propertarian relationship necessarily influence the structure of intellectual property forms. Intellectual goods, as well as legal relationships, impose information costs on property owners and third-party observers alike, although these costs will fall most heavily on observers. Observers will need to gather information, and information is never costless to obtain or use.<sup>59</sup> When information costs are high along some margins, legal rules can compensate in other ways. One strategy is to allocate the costs of gathering and comprehending information to the party that can best bear it. Owners know more about their property than do observers. If it is easy for owners to convey information about an intellectual good to others, then rules that force owners publicly to disclose and convey information,<sup>60</sup> such as by defining the boundaries and more general attributes of the good, can increase overall social welfare. Such rules may lower information costs for observers (which will be a large number of people),

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<sup>59</sup> For a discussion of information costs, see George J. Stigler, *An Introduction to Privacy in Economics and Politics*, 9 *J. Legal. Stud.* 623, 640–41 (1980) (arguing that transmitting information has positive costs; for example, classroom learning is not effortless). For a discussion of cognitive limitations, see Melvin Aron Eisenberg, *The Limits of Cognition and the Limits of Contract*, 47 *Stan. L. Rev.* 211, 214–16 (1995) (explaining limitations on human cognitive capacities to measure and process information); Robert A. Hillman, *The Limits of Behavioral Decision Theory in Legal Analysis: The Case of Liquidated Damages*, 85 *Cornell L. Rev.* 717, 720 (2000) (discussing limitations on human information-processing capacity).

<sup>60</sup> Disclosing and conveying information are two different things. Disclosing information is making it publicly available. Conveying information is making sure the information is readily transferable to the relevant audience. Information is disclosed but not conveyed if it is presented in a language that the audience is unable to understand. Information is conveyed but not publicly disclosed if it is privately given to only one third-party observer who readily understands it.

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while increasing information costs for owners (which will be a small number of people for any given good).<sup>61</sup> Information disclosure rules are efficient so long as they lower net costs to observers by more than they raise net costs to owners. If the number of interested observers is small, the net costs to owners of providing a definition may be greater than the net reduction for observers. When the value of an intellectual good varies over time, legal rules can also require owners to engage in periodic reevaluation of the good.

### *1. Allocating Informational Burdens*

There is a continuum of ways in which legal rules can allocate the burden of comprehending things and legal relations between owners and observers. The efficiency of dividing up informational responsibilities will depend on the costs and benefits of placing informational burdens on one party or another. In almost all cases, owners will know more about their intellectual goods than observers will.<sup>62</sup> Recall that different classes of observers will be interested in different subsets of information and will vary in their tolerance for searching and processing information. Having owners disclose information about their goods can lower costs for observers, so long as the information conveyed is readily understandable, verifiable, and relevant given the sophistication and knowledge of the audience.

Legal rules can place informational burdens predominantly on observers. Rules that place almost all the informational and cognitive duties on observers are efficient when the net costs to observers of absorbing information about the good and the legal relations regarding the good are smaller than the costs to owners of disclosing and conveying it. For example, when the protected good is land, we place strong duties on observers to engage in deciphering and investigating in order to fulfill their duties of avoidance. Land owners have minimal responsibilities for physical boundary marking and recordation. Note that physical boundary marking and recordation are strategies directed at two different categories of observers. Physical boundary marking is directed at avoiders (one might even say casual avoiders). Recordation is directed at transactors, observers who want a more detailed description of the boundaries of the land. Avoiders, particularly casual avoiders, will not generally be interested in spending the energy, mental or otherwise, to review the recordation documents. Transactors, by contrast, are unlikely to be satisfied that they know the boundaries of the property merely from observing a fence.

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<sup>61</sup> Disclosure will not always lower information costs for observers because being presented with more information is not always better. Owners may disclose so much information that observers would incur excessive costs attempting to separate relevant from irrelevant information. See *Ford Motor Credit Co. v. Milhollin*, 444 U.S. 555, 568 (1980) (“*Meaningful* disclosure does not mean *more* disclosure. Rather, it prescribes a balance between ‘competing considerations of complete disclosure . . . and the need to avoid . . . [informational overload].’” (alteration in original)).

<sup>62</sup> Observers may know more about the potential uses and value of an intellectual good than owners. Merely approaching an intellectual property owner to obtain a license may disclose information to the owner that the observer knows something about potential uses of the protected intellectual good that the owner does not. See 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, 615 (Nat’l Bureau of Econ. Research ed., 1962) (presenting Arrow’s famous information paradox); see also Lemley, *supra* note 1, at 1050–51 (discussing the bargaining difficulties arising from Arrow’s information paradox); Robert Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 *Tenn. L. Rev.* 75, 81–82 (1994) (same).

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Alternatively, legal rules could split the informational burden more equally between observers and owners.<sup>63</sup> For example, legal rules could reduce information costs for observers by requiring property owners to disclose information about the good's attributes, including its legally protected attributes, while requiring observers to process such information. This is efficient when the additional net information costs imposed on property owners are smaller than the net amount by which costs are lowered for observers. If the burden on property owners to disclose information is high, however, or if the number of observers is small, information-disclosure rules are less likely to be socially beneficial.<sup>64</sup> Sometimes raising information costs, however, can be socially beneficial. For example, requiring owners to disclose information about the good can make it easier for others to make improvements.<sup>65</sup>

How legal rules can and should respond to information costs is undoubtedly complicated. Sometimes it will be most efficient to define and measure protected goods. Other times it won't. Sometimes the most efficient outcome involves shifting costs; other times not. The upshot is that whether it is more efficient to raise or lower information costs will be driven by many factors. I will next examine some of the specific responses to information costs that can be found in patent and copyright law.

## 2. Information Asymmetry

### a. Two Strategies for Dealing with Information Costs.

Patent and copyright law each use slightly different strategies to address the problem of information asymmetry between owners and observers. Patent law requires detailed ex ante definition of the good and clearance by the U.S. Patent and Trademark Office ("PTO") as a condition precedent to getting protection.<sup>66</sup> Patent applicants must describe the invention in the body of the patent document (the specification) and at the end of the patent document, "particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention" in a series of claims.<sup>67</sup> Patentees must not merely define and discuss the good's boundaries, but must also provide a thick description of qualitative aspects of the invention. This includes explaining how to make and use the invention, the best way to do so, how the invention is different from others in the field (the prior art), the problems the inven-

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<sup>63</sup> For a related discussion of which side in a two-party, arms-length bargaining transaction will incur information costs and strategies to minimize them, see, for example, Barzel, *supra* note 25; Victor P. Goldberg, The Gold Ring Problem, 47 U. Toronto L.J. 469 (1997); Kenney & Klein, *supra* note 25, at 522–27 (1983).

<sup>64</sup> Information-forcing rules can be found in the contract law literature, as illustrated by *Hadley v. Baxendale*, 9 Eng. Rep. 145, 150–51 (Ex. 1854). The literature surrounding rules forcing revelation of information that the revealing party generally prefers to keep private is too large to be cited here. See, e.g., Ian Ayres & Robert Gertner, Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules, 99 Yale L.J. 87, 91 (1989) (coining the term "penalty" to refer to the information-forcing nature of the rule in *Hadley*); Charles J. Goetz & Robert E. Scott, The Mitigation Principle: Toward a General Theory of Contractual Obligation, 69 Va. L. Rev. 967 (1983) (discussing information-forcing default rules).

<sup>65</sup> Matthew J. Conigliaro et al., 16 Berkeley Tech. L.J. 1045, 1058 n.18 (2001) ("Ultimately, whether deemed pioneering inventions or technological improvements, all innovations build upon information already known to the public.").

<sup>66</sup> Complaints that the PTO does a poor job reviewing patents abound. See, e.g., Mark A. Lemley, Rational Ignorance at the Patent Office, 95 Nw. U. L. Rev. 1495, 1495 & n.1 (2001) (citing sources).

<sup>67</sup> 35 U.S.C. § 112 (2000).

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tor faced, and the steps he or she took to solve it.<sup>68</sup> Observers who read patent documents carefully can often discover such tidbits as the kinds of experiments the patentee conducted in the course of testing the invention, experimental results obtained, the patentee's version of the history of innovation in the field, and what the patentee thinks of the competition or competing products.<sup>69</sup> While a court may interpret the language of the patent after it has been issued, the nature of the judicial inquiry is not to fine-tune the scope of the patent (or indeed to adjust the scope of the patent after the fact), but to examine the validity of each claim.<sup>70</sup>

Once patentees have been granted the right to prevent others from "making, using, or selling" in the United States the subject matter claimed by the patent,<sup>71</sup> the marking statute allows owners to identify copies of each patented article they sell with the word "patent" or the abbreviation "pat.," along with the patent number.<sup>72</sup> Marking is not a requirement, but the failure to mark—forgoing the opportunity to put observers on notice when it is easy to do so—may reduce a patentee's damages.<sup>73</sup> Marking applies only to objects that are easily markable, as opposed to industrial processes and goods for which it is not easy to put observers on notice of patent protection.

Copyright takes a slightly different strategy from patent law. Creators of copyrighted materials do not need to define the boundaries or describe the attributes of their copyrighted goods; definition is postponed until a dispute arises or until parties negotiate over the rights.<sup>74</sup> Observers bear the costs of determining what constitutes the protected expression. Copyright, unlike patent, does not mandate state examination or approval, nor does it demand that works bear any indication of whether the creator is claiming copyright protection.<sup>75</sup> Because there is

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<sup>68</sup> The first paragraph of 35 U.S.C. § 112 reads:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

<sup>69</sup> See Brian Berliner, Method for Creating a Single Binary Virtual Device Driver for a Windowing Operating System, U.S. Patent No. 6,269,408 (issued July 31, 2001) (referring to a competing product as an "intellectual curiosity."); David R.P. Taylor et al., System and Method for a Communication System, U.S. Patent No. 6,147,773 (issued Nov. 14, 2000) (recommending Microsoft Windows as the operating system).

<sup>70</sup> 35 U.S.C. § 282 (validity of each patent claim is considered separately of every other claim).

<sup>71</sup> Id. § 271(a).

<sup>72</sup> See id. § 287(a) (promulgating marking requirements); id. § 292(a) (setting out penalties for false marking).

<sup>73</sup> Id. §§ 287(a), (b)(3)(A).

<sup>74</sup> Registration of the work with the Copyright Office (unless the Copyright Office has refused registration although the required deposit, application, and fee were properly filed) is required in order to bring an infringement suit. 17 U.S.C. § 411(a) (2000).

<sup>75</sup> As a practical matter, copyright owners frequently mark the subject matter of their rights, which is a low-cost (but imprecise) way of informing observers that the owner believes the good is subject to protection. See, e.g., Gordon, Merits of Copyright, supra note 27, at 1383 ("[T]he fixation and marking requirements, and the limits on protectable intellectual products and copyright owners' rights function as boundaries in the same way as the edges on personal property or physical boundaries around realty do."); Gordon, Harms and Benefits, supra note 27, at 470 (stating that the "c-in-a-circle" sign is an example of boundary demarcation in copyright). Lack of notice is not a defense to infringement; observers can be liable even when the owner has not marked the good. See 17 U.S.C. §§ 401(a), 402(a) (making notice permissive).

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no requirement of notice, registration, or recordation of transfers, identification and verification of ownership can be difficult.<sup>76</sup>

What explains the two opposing strategies: that of attempting, in the case of patent law, to define the entitlement sharply *ex ante* for all the world to see, while in the case of copyright law, defining the entitlement later, if ever, and then only between the parties to the dispute? The Demsetz thesis postulates that comprehensive definition of property rights is not a feasible option because information is costly and definition will proceed only up to the point where the marginal benefit of doing so equals the marginal cost.<sup>77</sup> As a resource becomes—or at least has the potential to become<sup>78</sup>—more valuable, we would expect incentives to specify and assign rights to the resource to increase,<sup>79</sup> although it is not clear whether legal rules will move toward more exclusion or more use as the value of the underlying good increases.<sup>80</sup> When a resource is not very valuable, or when the resource is difficult to capture or to define, private property rights over the resource will either not exist or will be defined only in rudimentary terms. When the transaction costs or information costs surrounding a resource are high, it may not be cost-effective to define property rights in detail, if at all.<sup>81</sup>

The relative costs and benefits of any given level of property rights definition are a function of many variables. These include the economic value of the good, the costs of comprehending the good-as-a-thing, the information costs imposed by the need to understand the legally defined boundaries of the good, the cultural norms and social meaning surrounding the good, the ease of creating goods protected by a particular property form, and the interests and size of the relevant class of observers. The usual answer for clear delineation, at least in property proper, is transaction cost based: Clear entitlements minimize transaction costs by

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<sup>76</sup> The Copyright Act of 1909 required creators to fulfill specific notification and registration requirements in order to receive federal copyright protection. Copyright Act of 1909, Pub. L. No. 60-349, ch. 320, §§ 9, 10, 18–19, 35 Stat. 1075, 1077, 1079 (1909). Creators could still bring an infringement action if notice was not placed on the good but the accused infringer had “actual notice” of the copyright. *Id.* The Copyright Act of 1976 made notice and registration permissive. See 17 U.S.C. § 401(a) (providing that “a notice of copyright . . . may be placed on publicly distributed copies”); *id.* § 402(a) (optional notice on phonorecords); *id.* § 408(a) (“[R]egistration is not a condition of copyright protection.”); *id.* § 205(a) (“Any transfer of copyright ownership or other document pertaining to a copyright may be recorded in the Copyright Office.”). Lack of notice may affect a copyright holder’s ability to recover, but lack of notice and registration can be cured after the accused infringement has occurred. See *id.* § 411(a).

<sup>77</sup> See Harold Demsetz, *Toward a Theory of Property Rights*, 57 *Am. Econ. Rev. (Papers & Proc.)* 347, 354 (1967) (“[P]roperty rights arise when it becomes economic for those affected by externalities to internalize benefits and costs.”).

<sup>78</sup> See *Toward an Understanding of Property Rights*, in *Empirical Studies in Institutional Change* 31, 32 (Lee J. Alston et al. eds., 1996) (“[I]t is not actual rent, but rather potential rent, that drives the *demand* for property rights. Potential rent is a function of the inherent rental stream (e.g., world price of the resource) and some benchmark set of possible property rights that are culturally and institutionally specific to a time and place.”).

<sup>79</sup> See Thráinn Eggertsson, *Economic Behavior and Institutions* 260–61 (1990) (rights will be more precise as resource value rises, all else being equal).

<sup>80</sup> See Smith, *supra* note 19, at 456 (isolating the impact that choices of access versus use measurement have on patterns of institutional arrangements).

<sup>81</sup> See Barzel, *supra* note 24, at 4–5 (noting that high transaction costs prevent the full value of an asset from being captured).

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allowing parties to figure out who owns what and to enter into the bargaining process,<sup>82</sup> whereas once parties are in the bargaining process, muddy or Solomonic entitlements may force parties to reveal private information and avoid bargaining breakdown.<sup>83</sup>

Net information costs are a function not only of the costs of defining the good, the specificity of the definition, and the number of people who must interpret the definition, but also of the number of goods that must be defined and cognized. When the cost of creating a particular type of good is low relative to its value, we would expect more of that type of good to be created than when the cost is not low. If most paradigmatic patented goods are harder to create than most paradigmatic copyrighted goods, all else being equal, we would expect to see a larger quantity of goods protected under the copyright form than under the patent form. This is precisely what we do find. The number of observers likely to encounter most patented goods will be smaller than the number of observers likely to encounter most copyrighted goods. The average observer of patented goods has a greater knowledge of the field and a higher tolerance of information costs than the average observer of copyrighted goods.<sup>84</sup>

We would expect legal rules to force disclosure of greater and more detailed information, and correspondingly to increase duties of avoidance, when the class of goods is small (because the goods are hard to create), when the goods affect fewer observers, when those observers have greater tolerance for incurring the costs of understanding the good, and when the disclosed information is objective and readily verifiable. This is indeed what we see with the patent form. Patented goods are harder to create, affect fewer observers who in turn have higher tolerance for incurring information costs, can be reduced to their functions, and possess more readily verifiable and objective attributes. Patentees are required to disclose detailed information about the invention—far more information than just its boundaries—and observers' duties of avoidance are absolute.

Conversely, we would expect legal rules to reduce information disclosure responsibilities and correspondingly to relax duties of avoidance when the class of protected goods is large, when many observers are affected, when observers are particularly concerned with economizing on information costs, and when the goods' attributes are subjective or hard to define. This describes the world of copyrighted goods. Copyrighted goods are numerous, easy to create, and affect many observers, most of whom will not be interested in learning detailed information about the good most of the time. Their attributes tend to be more subjective and less easily reduced to a referent. Copyright law does not require the good to be registered or

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<sup>82</sup> See, e.g., Rose, *supra* note 18, at 620 (discussing how sharply defined rights lower transaction costs); see also Gary D. Libecap, *Contracting for Property Rights* 12–26 (1989) (describing factors that make “contracting for property rights” easier or more difficult).

<sup>83</sup> Insightful as these explanations are, they implicitly assume thin markets of two defined parties. See Ayres & Talley, *supra* note 21, at 1030–32 (arguing that liability rules may facilitate bargaining by forcing parties to reveal private information). But see Louis Kaplow & Steven Shavell, *Do Liability Rules Facilitate Bargaining? A Reply to Ayres and Talley*, 105 *Yale L.J.* 221 (1995) (questioning the conclusions of Ayres and Talley).

<sup>84</sup> See Smith, *supra* note 47, at 1174 (comparing expertise of audiences in patent and copyright law); John Shepard Wiley, Jr., *Copyright at the School of Patent*, 58 *U. Chi. L. Rev.* 119, 129–34 (1991) (comparing the reliance on expert opinion in patent infringement cases with the greater tolerance for lay opinion in copyright infringement cases).

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described in order to be protected, but as I will demonstrate, it can allow observers to escape liability when information costs are high.

*b. Information-Disclosing Rules.*

Let's begin with a close examination of how information-disclosing rules affect information costs in the patent context.<sup>85</sup> A requirement of disclosure makes it easier for observers to determine the protected attributes of the invention. In a world in which only paradigmatic goods receive protection, simple pictures of widgets and other mechanical implements can convey large amounts of information at low cost. Because each invention is new and there is unlikely to be a pre-existing social understanding of the meaning of a particular invention (whereas everyone knows what "land" is), legal rules requiring the invention to be described can be a real boon for observers. Owners will possess more information than observers about their goods, and information-disclosing rules that require description of boundaries, particularly when those boundaries are difficult to determine upon casual inspection, will help observers better comprehend the good-as-legal-relations and thereby the extent of the owners' discretionary powers in the proprietarian relationship.<sup>86</sup> Because the value of many inventions protected by patents is frontloaded—the invention's value will be greatest at the beginning of the patent term and decrease as the invention becomes obsolete—definition is particularly helpful when the good is most unfamiliar.

With both the marking and patent registration requirements, it is more efficient to make a property holder describe the boundaries of the good, including qualitative attributes of the good, than it would be to force numerous observers to attempt to determine such boundaries from scratch. Observers must still incur the costs of determining the boundaries of protected property so as to fulfill their avoidance duties, but the patent specification—the document that describes the invention in detail—helps reduce this burden.

Definition, however, suffers from numerous problems as a means of lowering information costs. For one thing, multiple classes of observers must cognize the good. Disclosure may lower information costs for some observers, but only up to a point. The more complex the information disclosed by owners, the more the observers will have to spend resources understanding it. At some point, observers will have to spend more resources understanding the defined good than they would in the absence of the definition. Avoiders will hit the point of diminishing marginal returns most quickly. Detailed and complex information is not optimal for them. Definitional information benefits transactors somewhat, but the group most benefited by disclosed information is builders. When the underlying good is protected by the patent form, the legal system makes the assumption that most observers are builders rather than

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<sup>85</sup> Information disclosure rules have effects on the creation and distribution of goods as well. Patents have been described as an exchange of information for protection. See, e.g., *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 150–51 (1989) ("The federal patent system thus embodies a carefully crafted bargain for encouraging the creation and disclosure of new, useful, and nonobvious advances in technology and design in return for the exclusive right to practice the invention for a period of years.").

<sup>86</sup> See Gordon, *Merits of Copyright*, *supra* note 27, at 1378–84 (discussing physical edges of tangible property and intellectual property's functional equivalents); Gordon, *Harms and Benefits*, *supra* note 27, at 469 ("[P]roducers must provide a way to indicate which of the potentially covered subject matters . . . are owned and by whom.").

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avoiders or transactors. The patent document is not directed at layfolk; instead it is written for, and interpreted in light of, a “person having ordinary skill in the art” or PHOSITA.<sup>87</sup> These hypothetical PHOSITAs are similar to builders, except that they are omniscient in ways that builders are not.<sup>88</sup> Because patent law’s information-disclosing rules assume that the relevant audience—indeed, the only audience—is composed of individuals with omniscient knowledge of the field and state-of-the-art expertise, the disclosed information will be overly complex for many observers.

Information-disclosing rules suffer from other problems as well. Patent law’s margins of protection are notoriously difficult to measure and require measurement along other margins first. Some degree of ambiguity will be irreducible.<sup>89</sup> Patentees have incentives to behave opportunistically by revealing information that is misleading or by failing to reveal relevant information.<sup>90</sup> Although applicants are under a general “duty of candor and good faith” in their statements to the PTO, several factors mitigate the force of this duty.<sup>91</sup> Applicants merely warrant that the information contained in an issued patent is not known to them to be false.<sup>92</sup> This creates the incentive for patentees to remain willfully ignorant of information that might weaken the patent application or be beneficial to observers. Evidence shows that patent examiners are overwhelmed with patent applications and simply do not have adequate resources to deal with the flood of patents they face, which increases the potential for opportunistic behavior by patentees.<sup>93</sup> Because one way to reduce the costs of agreement is to agree on less, patentees and examiners may leave patent language ambiguous so as to reach an outcome faster.

Marking serves the same function as definition, but experiences some of the same problems.<sup>94</sup> In a world of paradigmatic patented goods (widgets), predicating the patentee’s ability to recover damages on marking almost certainly reduces net information costs. Rules that re-

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<sup>87</sup> 35 U.S.C. § 112 (2000) (stating that “[t]he specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art” to make and use the invention); see also *In re Alton*, 76 F.3d 1168, 1175 (Fed. Cir. 1996) (noting that whether the patent specification complies with the adequate written description requirement must be determined from the standpoint of a PHOSITA). The claims are also interpreted based on what a PHOSITA would know. See *Markman v. Westview Instruments*, 52 F.3d 967, 986 (Fed. Cir. 1995) (en banc) (stating that a claim term means “what one of ordinary skill in the art at the time of the invention would have understood the term to mean”). PHOSITAs were so labeled for the first time some decades ago. See Cyril A. Soans, *Some Absurd Presumptions in Patent Cases*, 10 IDEA 433, 438 (1966).

<sup>88</sup> See *In re Winslow*, 365 F.2d 1017, 1020 (C.C.P.A. 1966) (assuming that a PHOSITA knows all the relevant prior art).

<sup>89</sup> See *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 396 (Ct. Cl. 1967) (“The very nature of words would make a clear and unambiguous [patent] claim a rare occurrence.”).

<sup>90</sup> See R. Polk Wagner, *Reconsidering Estoppel: Patent Administration and The Failure of Festo*, 151 U. Pa. L. Rev. 159, 192–98 (2002) (noting that the patent system insists “that the patentee surrender knowledge of the invention for the public franchise of a patent”).

<sup>91</sup> 37 C.F.R. § 1.56(a) (2002).

<sup>92</sup> *Id.* (requiring that an applicant disclose “all information known to that individual to be material to patentability”).

<sup>93</sup> See, e.g., Lemley, *supra* note 66, at 1496 n.3 (stating that examiners have “on average, a total of eighteen hours” to spend examining each patent application).

<sup>94</sup> See, e.g., *Nike v. Wal-Mart Stores*, 138 F.3d 1437, 1443 (Fed. Cir. 1998) (stating that the marking statutes serve to help avoid innocent infringement, to encourage patentees to give notice to the public that the article is patented, and to aid the public in identifying whether an article is patented).

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quire owners to mark the patented widgets they put in the stream of commerce in order to recover full damages imposes costs on owners, but lowers them for observers. Marking is not a terribly onerous burden for owners, but it provides a low-cost way for observers to identify protected goods they encounter in the stream of commerce. In such a world, when observers see a widget for sale that is not marked, they can assume they have no duty to avoid it. If it is marked, indicating that it is patented, observers know, with little mental processing necessary, that they do need to avoid it. Marking exhibits some of the same informative functions with respect to paradigmatic patented goods that a fence achieves with respect to land.

We do not live in a world in which patent protection is confined to paradigmatic goods, however. We left such a world behind some time in the nineteenth century. As a result, it is not clear whether marking, on balance, lowers or raises net information costs. Marking lowers observers' information costs with respect only to some patented assets. The marking statute applies only to "articles"—not processes, methods, or many of the other nonparadigmatic assets currently covered by patent law. Thus while marking notifies observers at low cost that some goods are protected, it does not notify them of the existence of many protected goods they will encounter in the stream of commerce.

Another problem arises when infringers sell patented inventions that they do not mark. Because marking applies only to articles offered for sale by the patentee, observers are not put on notice, but are still liable for infringement, when they encounter the invention offered for sale by an infringer rather than the patentee, or when the patentee does not put the invention in the stream of commerce (such as when the patentee uses the good without distributing it). Observers are likely to encounter (1) marked protected goods that are offered for sale; (2) unmarked but protected goods that are offered for sale; (3) unmarked protected goods not offered for sale that they are nonetheless required to avoid; and (4) unmarked unprotected goods, both in the stream of commerce and not, that they may copy and use freely. The existence of marked goods may underdeter observers who think they need to avoid only marked items. Conversely, marking may overdeter cautious observers who know that the lack of a mark does not mean the item is not protected.

Marking has different benefits for different audiences. Marking most benefits avoiders and transactors, but will be of marginal value to builders. Avoiders will have little tolerance for costly information and are not interested in understanding detailed boundaries or qualitative aspects of intellectual goods. Marking serves as a convenient way to convey the crude information that benefits avoiders. Transactors will be interested in identifying protected goods and their owners. Marking helps in this inquiry, but it does not help with another query that interests transactors, namely what qualitative attributes the good possesses. Finally, marking helps builders only marginally—the marked patent number makes it easier for builders to conduct more research about the good, but it doesn't convey to them the detailed information they desire.

### *c. Information-Deferring Rules.*

At first blush, copyright's lack of definition and marking requirements seems odd. Definition of the boundaries of protection, it would seem, would be even more important in copy-

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right than in patent law for a number of reasons. First, the goods that are protected by copyright law tend to lack clear boundaries. There is plenty of uncertainty over the question of where to place the boundary between the public domain and private protection—of whether any given bundle of information constitutes a protectable good or unprotectable idea, concept, principle, or fact.<sup>95</sup> Even works that fairly clearly fall within what we normally think of as the realm of copyrightable goods may actually be in the public domain because protection has expired. Finally, the number of observers reasonably likely to come into contact with paradigmatic copyrighted goods is larger than the class of more specialized observers likely to encounter paradigmatic patented goods.

To be sure, copyright's fixation requirement helps lower information costs for observers, at least when the intellectual goods in question are paradigmatic copyrighted goods—books, music, paintings, and the like. When observers are trying to cognize protected goods, they will not have the owners' definitions of the goods available to them, but they will know that whatever is protected, it is contained within the pages of *this* book or appears on *that* canvas. While this doesn't provide observers with a concise answer to what is protected, at least it gives them parameters for their inquiry. But wouldn't more parameters be even better?

Requiring copyright owners to define a good's protected attributes for the rest of the world would often be a costly task. It will often be difficult for creators to describe the creative expression contained in their intellectual good in terms less complex than those of the good itself. The costs of defining copyrighted goods would in many cases exceed the costs of creating the goods, and any description, being literary, would itself be subject to copyright protection. While it's usually possible for an inventor to describe in verifiable and reasonably quantifiable terms what it is about a coffee mug, for example, that renders it new, useful, and nonobvious, how easily can the creator of a copyrighted good describe the protected original expression in a book or picture using information less complex than the book or picture? In most cases, it will be more difficult to reach agreement on the definition of the creative expression contained in copyrighted works than it will be to agree on the function of an invention. Even if the goods could be defined for observers, agreement on the terms of the definitions would be difficult because the expressive attributes of copyrighted goods are often more subjective than are the functional attributes of patented goods. When goods present high information costs, it will frequently be costly to define their legally protected boundaries. Because the costs of precisely determining the attributes of copyrighted goods are high, requiring property owners to define the attributes as a condition of receiving protection will often be more costly than the goods are worth.

Most copyrighted goods are easier to create than most patented goods. As one commentator has put it, "copyright law now protects every letter, memo, note, home video, answering machine message, e-mail, and doodle."<sup>96</sup> Each of us creates something protected by copyright law almost every time we put pen to paper or fingers to keyboard. Although copyright hold-

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<sup>95</sup> See Neil Weinstock Netanel, *Copyright and a Democratic Civil Society*, 106 *Yale L.J.* 283, 304 (1996) (describing copyright's idea/expression distinction as "notoriously malleable and indeterminate").

<sup>96</sup> See, e.g., Fred H. Cate, *The Technological Transformation of Copyright Law*, 81 *Iowa L. Rev.* 1395, 1399–1400 (1996) ("The 1976 Act substantially broadened and extended federal copyright protection.").

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ers have the best information about the characteristics of their creations, mandating that the boundaries or other attributes of copyrighted goods be formally defined would impose enormous costs on copyright owners. Owners would have to define so many goods, and observers would have to wade through so many definitions, that the sheer volume of goods needing to be defined would render formal definition too costly. Postponing formal definition of copyrighted goods until a dispute arises lowers such costs.

Almost everyone is likely to encounter copyrighted goods, given the ubiquity of creative works in our society and the lengthy term of protection afforded copyrighted goods.<sup>97</sup> Pure avoiders, who have no interest other than not being charged with infringement, will be the largest category of observers, outstripping the number of builders for any particular creative work. Most people, faced with most copyrighted goods, most of the time will be cognitive misers—they simply won't care about the creative expression contained in the good. Forcing copyright owners to disgorge complex, or even simple, information about the copyrighted goods would result in most observers being presented with more information than they wanted to know or could use. By contrast, patent law's detailed definitional and descriptive requirements don't seem so unusual considering the assumptions we make about the audience: the relevant observers are sophisticated experts in the field.

Another factor influencing the cost of definition is that patent protection of an invention does not cover smaller subunits of the bundle of information that comprises the invention, whereas copyright protection extends to subparts of the work. Put another way, patent owners receive protection for the goods as described in the claims, but not for subparts of the goods. For example, if Franny claims a coffee mug in its entirety, she gets protection for the mug in its entirety. If Jerry copies just the handle of the mug, Franny cannot recover for infringement, unless her patent contains a claim covering just the mug's handle. Copyright protection, by contrast, covers the work in its entirety plus subparts of the work. For example, Franny gets copyright protection not just for the material appearing in a document, but also for subsets of that material—paragraphs, pages, chapters, etc. Similarly, she gets protection for subparts of a picture in addition to the whole picture. Defining the boundaries of protection for each subpart would be costly, if not impossible. Because copyright protection extends to parts of the goods whereas patent protection does not, defining the protected attributes of patented inventions presents lower costs than defining the protected attributes of copyrighted works.

In sum, there are many forces influencing the cost-benefit tradeoff of disclosing information about protected goods in patent and copyright law. Many, but not all, of these forces pull in opposite directions. Note the relationship among the nature of the protected assets, who (if anyone) must bear the brunt of the costs of information disclosure, and the strength of the associated rights. When the size of the class of protected assets is small and the assets possess readily measurable attributes, requiring owners to disclose information lowers information

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<sup>97</sup> Copyright protection lasts for the life of the author plus seventy years. Copyright Term Extension Act, Pub. L. No. 105-298, 112 Stat. 2827, 2827–28 (1998) (codified as amended in scattered sections of 17 U.S.C.) (increasing the copyright term by twenty years). The Copyright Term Extension Act was upheld against constitutional challenges under the Copyright and Patent Clause and the First Amendment in *Eldred v. Ashcroft*, 537 U.S. 186 (2003).

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costs for observers. In patent law, so long as owners have disclosed the requisite information about the attributes of their assets, legal rules impose strict liability on observers for infringement. There is no exception for independent creation or ignorance of the existence of the patented item. Again, this follows from an information-cost theory. Once observers are informed, strict liability is an information-cost reducing strategy, since observers then don't have to investigate the nuances of their duties—they simply have to avoid the boundaries of the intellectual asset. This can help explain why patentees are under an absolute duty to inform, and observers are under an absolute duty to avoid. By contrast, when the size of the class of protected assets is large, as in copyright, when the assets possess attributes that are difficult to define, boundaries are hard if not impossible to mark clearly. Requiring owners to describe their goods does not help observers much and may even raise information costs. When the class of relevant observers is large, the existence of other mechanisms that compensate for high information costs becomes important. Because property rights impose corresponding duties, duty holders can legitimately expect that when the legally protected attributes of goods are not readily discoverable they will not be held liable.<sup>98</sup> Legal privileges that let observers off the hook when the costs of comprehending the good are high can reduce search costs and thereby reduce overall information costs.

### *3. Emergent Information.*

One concern well addressed within contract law, but not easily addressed in property, is that of emergent information about the optimal uses of a good. Much space in the contract literature has been devoted to how to treat emergent information. When circumstances are complex and uncertain, parties will find it costly, if not impossible, to specify all the possible conditions they might face.<sup>99</sup> Faced with uncertainty and unknown contingencies that prevent the parties from specifying precise contractual obligations, parties may choose instead to specify future performance standards so as to take advantage of emergent information.<sup>100</sup>

When the relationship is proprietarian, however, the literature is curiously silent about how parties can adapt to new information that emerges over time about a good or resource. As in the contractual context, the relationship between property holders and the rest of the world is an ongoing one. As time goes by, more information about the attributes and value of the resource can be expected to emerge. The potential for new information to emerge will be particularly acute when the resource is idiosyncratic and recently created. The resources most likely to display these qualities of thin but emergent information and variable value over time are information goods. For example, a patented widget may become obsolete quickly or turn

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<sup>98</sup> “Property is nothing but a basis of expectation. . . . There is no image, no painting, no visible trait, which can express the relation that constitutes property. It is not material, it is metaphysical; it is a mere conception of the mind.” Jeremy Bentham, *Theory of Legislation* 111–12 (R. Hildreth trans., 6th ed. 1987) (1931); see also Stephen R. Munzer, *A Theory of Property* 30 (1990) (arguing that the psychological dimension of property is comprised of expectations).

<sup>99</sup> See Oliver E. Williamson, *Markets and Hierarchies: Analysis and Antitrust Implications* 21–26 (1975).

<sup>100</sup> See Charles J. Goetz & Robert E. Scott, *Principles Of Relational Contracts*, 67 *Va. L. Rev.* 1089, 1091 (1981) (“[D]efinitive obligations may be impractical because of inability to identify uncertain future conditions or because of inability to characterize complex adaptations adequately even when the contingencies themselves can be identified in advance.”).

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out to be unexpectedly valuable; only a fragment of a copyrighted work may prove interesting to an audience.

Even though each parcel of land is unique, the variance in idiosyncrasy across all intellectual goods will be greater than the variance in idiosyncrasy across all parcels of land. Information about intellectual goods will usually be thin at first, but as familiarity with each good increases and the good's value and function become more readily verifiable over time, it can be efficient for rights to the good to be reassessed periodically. When the value of an underlying asset is volatile and information is asymmetric, having the person with the most knowledge of the good periodically reevaluate it can reduce information costs.

Patent law addresses the problem of emergent information, although in an admittedly crude and ham-fisted way. Patentees must pay maintenance fees on their utility patents at three points in the patent's life: three and one-half years, seven and one-half years, and eleven and one-half years after issue.<sup>101</sup> Failure to pay the fee is treated as abandonment of the patent after a six-month grace period, and the invention passes into the public domain.<sup>102</sup> Almost two-thirds of all issued patents have lapsed after ten years because of the patentee's failure to pay maintenance fees.<sup>103</sup> Although the rate of abandonment of patents may seem surprising, it shouldn't.<sup>104</sup> A rule that places a patent in the public domain if the patentee is unwilling to pay fairly small amounts of money forces patentees, who are in the best position to know the value and use of the patented good, periodically to revalue their patents. Patentees acquire patents for many reasons, not all of them financial,<sup>105</sup> but most patents are economically worthless.<sup>106</sup> Professor Mark Lemley estimates that "the total number of patents litigated or licensed for a royalty (as opposed to a cross-license) is on the order of five percent of issued patents."<sup>107</sup>

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<sup>101</sup> 35 U.S.C. § 41(b) (2000).

<sup>102</sup> Id. Patentees who have failed to pay the maintenance fee may file a petition to reinstate the patent, demonstrating the delay was unavoidable or unintentional. 37 C.F.R. § 1.378 (2002). See, e.g., Centigram Communications Corp. v. Lehman, 862 F. Supp. 113, 114 (E.D. Va. 1994) (reinstating patent). But see Ray v. Lehman, 55 F.3d 606, 608–09 (Fed. Cir. 1995) (upholding denial of petition to reinstate patent for failure to pay maintenance fee).

<sup>103</sup> In 2002, the renewal rate for patents after three years was 85.1%, after seven years was 59.5%, and after eleven years was 38.4%. U.S. Patent and Trademark Office, Performance and Accountability Report for Fiscal Year 2002, at 51 (2003); see also Lemley, supra note 65, at 1503–04 (setting out table showing rates at which patents lapse because of patentees' failure to pay maintenance fees). Maintenance fees are \$830 at 3 1/2 years, \$1900 at 7 1/2 years, and \$2910 at 11 1/2 years. 35 U.S.C. § 41(b).

<sup>104</sup> See Jean O. Lanjouw et al., How to Count Patents and Value Intellectual Property: The Uses of Patent Renewal and Application Data, 46 J. Indus. Econ. 405 (1998) (discussing maintenance fees and patent value).

<sup>105</sup> See Long, supra note 7, at 627 (discussing reasons patentees obtain patents other than appropriating the protected invention).

<sup>106</sup> See Edmund W. Kitch, Property Rights in Inventions, Writings, and Marks, 13 Harv. J.L. & Pub. Pol'y. 119, 122–23 (1990) (arguing that "most issued patents are worthless, or very nearly worthless [having] no market value, much less market power"); Robert P. Merges, As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform, 14 Berkeley Tech. L.J. 577, 603 (1999) ("[M]ost [patented] technologies will not be economically viable or commercially successful.").

<sup>107</sup> Lemley, supra note 66, at 1507. Professor Lemley believes that "[a]t most only about two percent of all patents are ever litigated, and less than two-tenths of one percent of all issued patents actually go to court." Id. at 1501. He estimates that "[i]f anything, these numbers are on the high side, because many patents that do go to court are litigated in more than one case. Thus, the total number of *different* patents litigated may actually be somewhat smaller." Id. at 1501 n.27.

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Periodic all-or-nothing reevaluation of a patent has its disadvantages. It raises information costs for patent owners, who must spend resources analyzing the value of their inventions over time. It imposes transaction costs on owners and the PTO alike, although the PTO does collect significant amounts of money in maintenance fees.<sup>108</sup> It conveys little specific information about an invention protected by a patent other than that the patentee's valuation of the invention was higher than the maintenance fee. Maintenance fees also raise information costs for avoiders along one margin because avoiders may be over-deterred. Avoiders who previously knew that a particular invention was patented may continue to think they are required to avoid infringing the patent when in fact they are not.

Periodic reevaluation, however, lowers information costs along other margins. Over time observers are presented with fewer protected goods that must be avoided. Requiring the patentee to engage in periodic but simple reassessment conveys crude information about the patentee's opinion of the value of the protected good. (Of course, a rule that cuts the term of protection short and puts inventions in the public domain has powerful distributional implications.) Because innocent or unintentional infringement is not a defense in patent law, a rule eliminating patents that prove worthless over time cuts down on the number of truly unintentional infringements (since no one is likely deliberately to infringe a patent that is economically worthless, unless the infringer has private information that the value of the patent is considerably higher than the patentee believes).

What benefit would we get from requiring copyright holders to engage in periodic reevaluation of their copyrighted goods?<sup>109</sup> After all, one complaint heard frequently in the copyright realm is that many creative works remain protected decades after owners cease to care about their rights to the works, which imposes needless avoidance costs on observers.<sup>110</sup> Reevaluation of copyrighted works would affect the term of protection for many works by moving unreevaluated goods into the public domain, thus reducing net avoidance costs; it would do little to reduce information asymmetries between owners and observers about qualitative attributes of the good. Reevaluation would raise information costs for owners, who would have to reconsider the value of their works periodically. It would raise information costs for observers along some margins and lower them along others. Observers would now have to learn

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<sup>108</sup> The PTO raised the following revenue (in millions) from patent fees alone from 1999–2002: \$238.2 in 1999; \$259.9 in 2000; \$325.9 in 2001; and \$413.1 in 2002. U.S. Patent and Trademark Office, *supra* note 103, at 49.

<sup>109</sup> Copyright law gives creators a one-time reversionary interest in certain kinds of works, which allows them to terminate grants of transfer or license, but it does not affect the term of protection. See 17 U.S.C. §§ 203, 304 (2000) (setting forth which works are covered by the termination provisions, when termination may be exercised, and by whom). Copyright's termination provisions have even less value in forcing information or reducing information costs than patent law's renewal provisions. Copyright termination is permissive and applies only to certain works; patent renewal is mandatory and applies to all patents. Termination indicates that the exerciser of the right believes the work is undervalued; it provides no other information about the value of the good. Failure to renew a patent indicates that the owner believed the invention was worth less than the renewal fee. Termination does not affect protection, so it does not reduce avoidance costs; patent renewal reduces the number of protected goods and thereby reduces avoidance costs.

<sup>110</sup> See William M. Landes & Richard A. Posner, *Indefinitely Renewable Copyright*, 70 U. Chi. L. Rev. 471 (2003) (discussing argument); see also Lawrence Lessig, *The Future of Ideas: The Fate of the Commons in a Connected World* 251–52 (2001) (proposing a renewal regime for copyrighted works, with unrenewed works passing into the public domain).

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the additional information about whether a previously protected good remained protected, although there would be fewer goods to avoid and thus avoidance costs would be lower. Even with periodic reevaluation, however, the disclosure value of such a rule is low. Recall that copyrighted goods are valued for their expressive features rather than their functional ones and that expressiveness is more subjective and less subject to verification than functionality. A rule that placed copyrighted goods in the public domain if owners ceased to claim protection would provide crude information about the value of a good to its owner, but it would not convey much verifiable information about the social value of the good generally or its qualitative features.

### *B. Entitlement-Assigning Strategies*

The boundaries of a good may be difficult to decipher because they are unmarked, because the attributes of the good are highly subjective, or because there are many such goods to observe.<sup>111</sup> When boundaries are difficult for observers to decipher, such as in copyright, the chances are high that observers will inadvertently infringe or will spend inefficient amounts of time and cognitive resources attempting to determine the contours of the many facets of the proprietarian relationship. When attributes of the protected good are difficult to define, when boundaries are costly or impossible to mark, or when the marginal cost of avoidance is high, legal rules can allow observers to escape liability for infringement when the marginal costs of avoidance are too high.

Legal privileges in intellectual property law allow observers to engage in behavior that would otherwise be infringing activity. Privileges that let observers off the hook when search costs or the costs of comprehending the good are high can lower information costs at the margin. To be sure, splitting the entitlement to the intellectual good in this manner increases information costs along the margin of understanding legal relations because bright line exclusionary rules are easier to understand.<sup>112</sup> Similarly, legal privileges place cognitive demands on observers and owners alike to distinguish circumstances under which a particular behavior is excused from circumstances under which the same behavior constitutes infringement. Privileges such as the independent creation exception in copyright can decrease information costs by lowering the search costs observers must incur in order to fulfill their duties of avoidance.

#### *1. Distributing Entitlements*

Recall that goods are composed of various attributes. Entitlements to control various attributes of the good need not be held by only one party. A timeshare, for example, allows different parties to use the same good, but at different times. Similarly, entitlements are divided between parties in future interests, trusts, and easements, to name a few. Intellectual property

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<sup>111</sup> Recall that registration and notice are not required in copyright; works need not be marked to indicate that owners are claiming copyright protection.

<sup>112</sup> See Thomas W. Merrill, *Property and the Right to Exclude*, 77 *Neb. L. Rev.* 730, 731 (“Understanding . . . the right to exclude . . . may promote a clearer understanding of the often-arcane legal doctrine that surrounds this institution.”); see also Waldron, *supra* note 2, at 42–43 (arguing that bright line rules of exclusion are a simple and universal “organizing idea”).

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forms divide entitlements as well. A book is a multi-attribute good in which some uses of the good (such as reproducing the book) are controlled by the copyright holder while others (such as reading the book) are not.

Copyright law divides entitlements in several ways. First, it confers on owners an incomplete set of exclusionary rights.<sup>113</sup> If a copyright owner's entitlement were complete, the owner would be able to control access to and use of the protected good against all parties under all circumstances. Property rights are never complete,<sup>114</sup> but entitlements in the copyright form tend to be more contingent, nuanced, and dispersed than in other property forms, particularly the patent form. The owner of a copyrighted work has the exclusive right to reproduce the work and to prepare derivative works from it.<sup>115</sup> Owners cannot prohibit all uses of a protected work, but only certain defined uses, namely reproduction in tangible copies, adaptation and certain alterations, public distribution, public performance, and public display.<sup>116</sup> Thus an observer who browses through a copyrighted book in a bookstore does not infringe, even though the observer is using the book and in some sense is making a temporary "copy" of the material in her head. Each of these exclusionary categories contains exceptions that further limit the reach of the copyright owner's entitlement.<sup>117</sup> An observer who recites a copyright owner's protected speech or poem in the privacy of her own home is free to do so. Although the protected material is in some sense copied as it is recited, the recitation counts not as a "copy" but only as a private performance and copyright law protects only public performances.<sup>118</sup> The residual use right is left either in the commons without restriction (as with merely reading a literary work) or with some restrictions (as with reciting a work, but doing so privately).

Not only does copyright law limit owners' rights by leaving some uses in the public domain, but it also, under the right circumstances, excuses what would otherwise be infringing uses. Copyright's independent creation exception gives a defense against infringement to second-comers who have innocently recreated an already-protected good.<sup>119</sup> The independent creation privilege divides entitlements between owners and observers, leaving a portion of the entitlement in the public domain.<sup>120</sup>

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<sup>113</sup> See 17 U.S.C. § 106.

<sup>114</sup> Professor Carol Rose has pointed out that even Blackstone's language about private property being "that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe" is followed by qualifications. Rose, *supra* note 18, at 632 (quoting 2 William Blackstone, *Commentaries on the Laws of England* \*2 (1765–69)). Rose continues, "[W]hen scholars read Blackstone's ringing words about property as exclusion, they should read the rest of the paragraph too—to appreciate Blackstone's anxiety and to consider how much of that anxiety redounds back to the seemingly mighty axiom of exclusive dominion." *Id.* at 632.

<sup>115</sup> 17 U.S.C. § 106(1)–(2).

<sup>116</sup> *Id.* § 106.

<sup>117</sup> *Id.* §§ 107–121.

<sup>118</sup> *Id.* § 101 (defining performance); *id.* § 106 (specifying that the owner has the right to control public performances).

<sup>119</sup> See, e.g., *Alfred Bell & Co. v. Catalda Fine Arts, Inc.*, 191 F.2d 99, 103 (2d Cir. 1951).

<sup>120</sup> It is important to distinguish the public domain in which access to a resource or specific attributes of a resource is open to all from a regime in which a large group has limited access to a resource. The latter is sometimes called a limited commons. See Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* 23 (1990) (arguing that a regime of open access is quite different from a limited commons).

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By contrast with copyright law, in which entitlements are split, patent law concentrates entitlements overwhelmingly in owners. Patentees have the right to prevent others from all uses and reproduction of the item.<sup>121</sup> There is no exception for innocent or de minimis infringement.<sup>122</sup> Patent law contains no viable general privileges.<sup>123</sup> Although it does formally contain two privileges—the experimental use exception and the reverse doctrine of equivalents—they are all but defunct. The U.S. Court of Appeals for the Federal Circuit, which has sole jurisdiction over patent appeals,<sup>124</sup> has announced that the experimental use exception’s days are numbered<sup>125</sup> and proudly declares that it has struck down every successful assertion of the reverse doctrine of equivalents.<sup>126</sup> The experimental use exception, which excuses what would otherwise be infringing use, allows observers unauthorized use of an invention if the use is “limited to actions performed ‘for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry.’”<sup>127</sup> The exception is so narrow, however, that it does not encompass scientific or research uses that could lead to the development of a commercial product or uses that have any commercial implications, however remote.<sup>128</sup> Under the reverse doctrine of equivalents, accused infringers with a product or process falling within the literal scope of a patent claim can escape liability if the accused product or process “is so far changed in principle from a patented article that it performs the same or a similar function in a substantially different way.”<sup>129</sup> The reverse doctrine of equivalents relies on the concatenation of several statistically unusual circumstances—an accused product or process that literally infringes yet is so different from the patented invention that it is a completely different invention—that it is seldom

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<sup>121</sup> See 35 U.S.C. § 271 (2000) (defining patent infringement as making, using, selling, offering to sell, or importing a patented invention without permission, or actively inducing infringement of a patent).

<sup>122</sup> See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 35–36 (1996) (holding that infringement is a strict liability offense); *Embrex, Inc. v. Serv. Eng’g Corp.*, 216 F.3d 1343, 1352 (Fed. Cir. 2000) (Rader, J., concurring) (“[T]he Patent Act leaves no room for any *de minimis* or experimental use excuses for infringement.”); see also *Deuterium Corp. v. United States*, 19 Cl. Ct. 624, 631 (1990) (“This court questions whether any infringing use can be *de minimis*. Damages for an extremely small infringing use may be *de minimis*, but infringement is not a question of degree.”).

<sup>123</sup> The patent statute contains a limited privilege in the form of prior users’ rights for “method[s] of doing or conducting business.” 35 U.S.C. § 273. The privilege only applies to business method patents and can be used only by observers who can show they were secretly using the business method themselves for at least a year before the patentee filed its patent. *Id.* § 273(b)(1).

<sup>124</sup> See 28 U.S.C. § 1295 (2000) (setting out the jurisdiction of the United States Court of Appeals for the Federal Circuit).

<sup>125</sup> See *Embrex*, 216 F.3d at 1352 (Rader, J., concurring) (“[B]ecause intent is irrelevant to patent infringement, an experimental use excuse cannot survive.”).

<sup>126</sup> See *Tate Access Floors, Inc. v. Interface Architectural Res.*, 279 F.3d 1357, 1368 (Fed. Cir. 2002) (“Not once has [the Federal Circuit] affirmed a decision finding noninfringement based on the reverse doctrine of equivalents. And with good reason.”).

<sup>127</sup> *Madey v. Duke Univ.*, 307 F.3d 1351, 1362 (Fed. Cir. 2002) (emphasizing the narrowness of the experimental use exception (quoting *Embrex*, 216 F.3d at 1349)).

<sup>128</sup> See Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. Chi. L. Rev. 1017, 1018–20 (1989) (advocating a broader experimental use defense). Exempting experimental uses of inventions from infringement is widely accepted in the international community. See Janice M. Mueller, No “Dilettante Affair”: Rethinking the Experimental Use Exception to Patent Infringement for Biomedical Research Tools, 76 Wash. L. Rev. 1, 37–39 (2001).

<sup>129</sup> *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608–09 (1950); *Del Mar Avionics, Inc. v. Quin-ton Instrument Co.*, 836 F.2d 1320, 1325 (Fed. Cir. 1987) (holding that the accused infringer must prove that, despite the asserted claims literally reading on the accused device, “it has been so changed that it is no longer the same invention”).

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invoked and for all practical purposes is never successful.<sup>130</sup> Patent law is effectively devoid of privileges and is characterized by strong, unified entitlements protected by property rules.

Why do patent and copyright law bundle entitlements so differently? Each strategy—that of giving owners strong exclusionary rights or of dividing the entitlement between owners and observers—has costs and benefits. Differential bundling can be explained as a way to compensate for the different information cost profiles presented by inventions and expressive goods. Before we can understand how the costs and benefits of these two strategies net out, we need to examine each in detail.

Consolidating entitlements in property owners by granting them strong exclusionary rights is often justified in terms of the conventional model of intellectual property rights. Strong property rights, on this view, achieve optimum incentives for creation and distribution of intellectual goods. Professor Edmund Kitch argues that granting broad patents early in the research and development process rewards first-comers and places the patent holder “in a position to coordinate the search for technological and market enhancement of the patent’s value so that duplicative investments are not made and so that information is exchanged among the searchers.”<sup>131</sup> Professor Wendy Gordon makes a similar argument with respect to copyright law, maintaining that copyright protection, like patent protection, “may be necessary to facilitate or organize post-creation dissemination of the work.”<sup>132</sup> Other commentators have disagreed, pointing out that in intellectual property, unlike real property, goods are cumulative: consolidating entitlements in upstream works raises barriers to the creation of downstream works.<sup>133</sup> The creation of value is curtailed when property rights to valuable resources belong to and stay with owners who do not put the resources to their most valuable uses.<sup>134</sup> While granting broad exclusionary rights may take advantage of patentees’ superior information, it can also steer research away from incremental improvements to existing inventions or contribute to bargaining breakdown between original creators and follow on creators.<sup>135</sup> As Professor Mark Lemley has put it, “[e]xpecting one party—original inventor or not—to perfectly identify the potential uses of a new invention, how it might be improved, and who can best improve it is simply not realistic.”<sup>136</sup> Similarly, when considering derivative works in copy-

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<sup>130</sup> See *Tate Access Floors*, 279 F.3d at 1368 (noting that the Federal Circuit has never upheld a lower court decision that used the reverse doctrine of equivalents to excuse infringement); see also *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1351 (Fed. Cir. 2003) (rejecting a reverse doctrine of equivalents defense); *Smithkline Diagnostics v. Helena Labs. Corp.*, 859 F.2d 878, 890 (Fed. Cir. 1988) (same).

<sup>131</sup> Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 *J.L. & Econ.* 265, 265 (1977) (arguing that the patent system increases “the output from resources used for technological innovation”); see also F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 *Minn. L. Rev.* 697, 707 n.47 (2001) (discussing the prospect theory).

<sup>132</sup> Wendy J. Gordon, *Asymmetric Market Failure and Prisoner’s Dilemma in Intellectual Property*, 17 *U. Dayton L. Rev.* 853, 855 n.13 (1992) (applying Professor Kitch’s prospect theory to copyright law).

<sup>133</sup> See, e.g., Lemley, *supra* note 1 (discussing derivative works); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research & the Patent Law*, 5 *J. Econ. Persp.* 29 (1991).

<sup>134</sup> See Barzel, *supra* note 24, at 3–15.

<sup>135</sup> See, e.g., Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Inventions*, in *The Rate and Direction of Inventive Activity* 609 (Richard Nelson ed., 1962); Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 *Colum. L. Rev.* 839 (1990).

<sup>136</sup> Lemley, *supra* note 1, at 1050.

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right, Professor Gordon has suggested that concentrating strong rights in original creators may be inapropos because “central control would unduly inhibit creative adaptations.”<sup>137</sup>

Such familiar arguments, relevant as they are to the creation and distribution of intellectual goods, don’t describe the effects that consolidating entitlements in owners have on the creation and distribution of information *about* goods. Concentrating entitlements in owners lowers information costs along the margin of understanding legal rules. When entitlements are vested entirely in owners, with no privileges in observers, observers’ duties are very simple. Observers are under an absolute duty to avoid the protected good; there are no exceptions. Such a bright line rule is easy to remember. (Note that it is not always so easy to apply, because determining legally protected attributes, particularly when the good is an intellectual good, can be difficult.) All observers need remember only that they must avoid the good under all circumstances.<sup>138</sup> All observers will care about avoiding, but avoiders will care about little else. Concentrated entitlements also benefit transactors and builders in various ways. Assigning the entitlement to owners rather than third parties reduces transaction costs and the costs of identifying owners.<sup>139</sup> Concentrating entitlements in owners facilitates transactions because potential builders—creators of derivative works—can avoid having to deal with many holders of different rights.

But if concentrated entitlements lower information costs along the margin of understanding legal rules and identifying owners, they raise them along the margin of cognizing and processing information about protected goods. When observers are required to avoid all goods protected by a particular property form, avoidance costs will be greater the harder the goods are to detect. If the goods are new, intangible, undefined, unmarked, numerous, ubiquitous, or idiosyncratic, they will be harder to avoid than if they are not. When the goods possess all of these qualities, avoidance costs will be high. Similarly, avoidance costs will be higher if the observers do not already have special knowledge about the goods. All else being equal, the sum of avoidance costs across all observers will increase with the number of goods to be avoided and the size of the class of observers realistically likely to encounter the good. How the costs and benefits net out is impossible to determine conclusively. What is apparent, however, is that the characteristics of some goods, such as those typically subject to patent protection, favor concentrated entitlements, whereas those of other goods, such as those typically subject to copyright protection, will favor divided entitlements.

Goods that present lower information costs when protected by consolidated entitlements—entitlements in which privileges in third parties are absent—are those for which detection and avoidance are easy. Detection and avoidance may be easy because the good is readily reduced to a referent. Observers can easily classify the good-as-a-good and then determine

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<sup>137</sup> Wendy J. Gordon, *On Owning Information: Intellectual Property and the Restitutionary Impulse*, 78 Va. L. Rev. 149, 247 (1992).

<sup>138</sup> See Waldron, *supra* note 2, at 42–43 (discussing the benefits of bright-line exclusionary rules); Carol M. Rose, *Possession as the Origin of Property*, 52 U. Chi. L. Rev. 73, 81–82 (1985) (arguing that property law often rewards those who make their claims clear).

<sup>139</sup> See William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright Law*, 18 J. Legal Stud. 325 (1989).

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whether they need to exert more mental effort to understand its attributes. Avoidance may be easy because the boundaries of the good are clear or because the good can be objectively described. Or avoidance may be easy because the good is unusual or so hard to copy that infringement is physically difficult. Finally, avoidance may be easy because the good is so rare that infringement is statistically unlikely, or the good is so specialized or unusual that it is not widely distributed and most observers are unlikely ever to encounter it.

The goods paradigmatically subject to patent protection fall more readily into this list than the goods paradigmatically subject to copyright protection. Paradigmatic patented goods are functional by nature; if they were not, they would not be subject to patent protection. Their functionality makes them easy to detect, define, and avoid. Given that it is possible to describe and define most patented goods (particularly paradigmatic patented goods) in a relatively objective and verifiable manner, and that producing such goods is costly, legal rules that require public definition make avoidance easier. Patented goods are likely to be of more than a passing interest to only a very small audience, which reduces the size of the group of observers likely to be in a position to infringe and thereby lowers the total social costs of avoidance. Such an audience is likely to be familiar with the technology of the good and thus more tolerant of incurring the relevant information costs. Of course, some patented goods will be easier to infringe inadvertently than some copyrighted goods. A business method that could be practiced by many individuals will often be harder to cognize, define, and avoid at low cost than a familiar and easily represented figure like Mickey Mouse. Nonetheless, for most paradigmatic patented goods, legal rules that consolidate entitlements in owners do not raise the information costs of searching and avoiding goods unduly. And legal rules that mandate exhaustive searches (because privileges based on ignorance of the good are unavailable) can have positive benefits in assuring greater creation and distribution of goods themselves. The benefits of punishing independent creation and forcing would-be builders to go the extra mile to avoid infringing may well be worth the additional search costs.

Sometimes dividing entitlements between parties can be more efficient than consolidating them.<sup>140</sup> Resources can tend towards their most valuable use only when property rights to those resources are placed in the hands of those who are in a position to put them to best use.<sup>141</sup> Some parties may be better placed than others to put the good or some of its attributes to best use. The party in the best position to increase the value of certain attributes of the good will not always be the owner. Consolidating rights in owners and letting owners negotiate with third parties over the transfer of property rights in whole or in part is one way of letting resources flow to the user who values them most. Such a solution, however, is not always possible. The literature has well recognized bargaining breakdown as a cause of resources failing to move to their best use.<sup>142</sup> On this view, dividing up entitlements can as-

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<sup>140</sup> See James E. Krier & Stewart J. Schwab, Property Rules and Liability Rules: The Cathedral in Another Light, 70 N.Y.U. L. Rev. 440, 447–49 (1995) (discussing the idea that entitlements should be assigned to place the risk of loss on the cheapest cost avoider).

<sup>141</sup> See Barzel, *supra* note 24.

<sup>142</sup> See, e.g., Heller, *supra* note 23, at 677 (arguing that bargaining breakdown can occur when too many individuals have rights of exclusion in a scarce resource); Clarisa Long, Proprietary Rights and Why Initial Allocations Matter, 49 Emory L.J. 823 (2000) (noting that transaction costs may prevent patented products from being licensed to the user who values them most).

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sure more optimal distribution of goods. For example, Professors Ian Ayres and Eric Talley discuss how structuring entitlements so that they are protected by liability rules rather than property rules can overcome such bargaining impasses.<sup>143</sup> Such a justification for split entitlements, however, revolves (once again) around the optimal creation and distribution of goods rather than around information *about* goods.

Like the strategy of entitlement consolidation, splitting entitlements by conferring privileges on observers raises information costs along some margins and lowers them along others. Privileges raise information costs along the margin of understanding legal rules. When rights to only some uses of the good are held by property owners, determining the contours of legal relationships will be more costly than when entitlements are concentrated in owners as a bundle of strong exclusionary rights. Privileges create exceptions to bright-line rules of avoidance, making it necessary to learn how to apply both the rules and the exceptions. Not surprisingly, privileges are difficult to apply in practice, not least because the circumstances under which they can be exercised are nuanced and specific.

Depending on how they are structured, privileges can lower information costs when observers are surrounded by goods that are difficult to detect and avoid. A number of factors militate in favor of creating privileges, and thereby splitting entitlements, when the goods subject to protection are paradigmatic copyrighted goods. The costs and benefits a privilege creates, and the way these net out, depends entirely on what behavior the privilege allows, under what conditions it allows this behavior, and what attributes of the good are covered by the privilege. I now turn to copyright's independent creation privilege.

## *2. Independent Creation*

Independent creation is no defense to a claim of patent infringement. By contrast, one of the most distinctive features of copyright law is its focus on actual *copying* rather than just making an existing good. To be eligible for copyright protection, a work must be original (independently created), even if it lacks novelty and is identical to a work previously created by another.<sup>144</sup> Independent creation is both a requirement for copyright protection and a defense against an accusation of infringement.<sup>145</sup> Observers who create a protected work independently can claim a copyright in that work separate from the original creator's.

Why does copyright law contain a privilege in the form of independent creation, whereas patent law does not? It has proven to be something of a puzzle why the independent creation privilege exists in a context where true independent creation is statistically unlikely, but does

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<sup>143</sup> See Ayres & Talley, *supra* note 21, at 1029 ("Dividing a legal entitlement between rivalrous users can facilitate efficient trade.").

<sup>144</sup> See *Feist Publ'ns v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991) ("To qualify for copyright protection, a work must be original to the author. Original, as the term is used in copyright, means only that the work was independently created by the author (as opposed to copied from other works), and that it possesses at least some minimal degree of creativity." (citation omitted)).

<sup>145</sup> See *Boisson v. Banian Ltd.*, 273 F.3d 262, 270 (2d Cir. 2001); see also *Acuff-Rose Music v. Jostens, Inc.*, 155 F.3d 140, 143 (2d Cir. 1998) ("Originality does not signify novelty; a work may be original even though it closely resembles other works so long as the similarity is fortuitous, not the result of copying." (quoting *Feist*, 499 U.S. at 345)).

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not exist in a context where true independent creation (and therefore true innocent infringement) is more likely. Because independent creation of inventions is more likely than independent creation of artistic works, more observers would benefit from an independent creation exception for patented goods than for copyrighted goods. True independent creation of any but the simplest of artistic works, with perhaps the exception of popular music, is statistically highly unlikely. A poem of any length longer than a few lines (if that) is likely to be so distinctive that no two people are likely to create it twice. As Professor Dennis Karjala has said, “[w]e simply would not believe anyone who claimed independently to have re-created Keats’ *Ode on a Grecian Urn*, notwithstanding Judge Learned Hand’s oft-cited use of that example”<sup>146</sup> in *Sheldon v. Metro-Goldwyn Pictures Corporation*.<sup>147</sup> By contrast, nearly identical or overlapping inventions are frequently developed, often contemporaneously, in patent law.<sup>148</sup> And yet the privilege exists precisely where it will rarely be needed and is absent where it would do the most work.

Over time, the independent creation privilege has been refined so as to minimize net evidentiary costs while raising search and avoidance costs. In an infringement suit, an owner may show that an accused observer with a substantially similar work merely had *reasonable* access to the owner’s good, a showing often satisfied by evidence that the good was publicly distributed.<sup>149</sup> The burden then shifts to the accused observer to demonstrate that she did not encounter the good, an assertion that is difficult to verify.<sup>150</sup> If instead owners needed to prove that an accused observer had *actual* access to a substantially similar work, net evidentiary costs would be higher, although net search and avoidance costs would be lower.<sup>151</sup> On balance, it is not clear how the costs net out: Does the reduction in the administrative costs of the rule for the few independent creation cases that will be brought offset the increase in search and avoidance costs for many observers? Absent empirical evidence, we can only speculate. Development of the rule in this direction is unsurprising; we would expect adjudicators to economize on the very real and immediate administrative costs they face, rather than on the less obvious costs faced by large numbers of faceless observers.

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<sup>146</sup> Dennis S. Karjala, Copyright Protection Of Operating Software, Copyright Misuse, and Antitrust, 9 Cornell J.L. & Pub. Pol’y 161, 168 n.19 (1999).

<sup>147</sup> 81 F.2d 49, 54 (2d Cir. 1936).

<sup>148</sup> See Roger D. Blair & Thomas F. Cotter, Strict Liability and Its Alternatives in Patent Law, 17 Berkeley Tech. L.J. 799, 810 (2002) (stating that “the probability of independent development of an invention containing all the elements of a patented invention may be relatively high”).

<sup>149</sup> See, e.g., Joy Mfg. Co. v. CGM Valve & Gauge Co., 730 F. Supp. 1387, 1399 (S.D. Tex. 1989) (holding that “copying” for purposes of a copyright infringement claim can be established by showing that the accused infringer had access and substantial similarity existed between the accused and copyrighted works). Mere similarity between two works may be treated as proof of access. See Susan Wakeen Doll Co. v. Ashton Drake Galleries, 272 F.3d 441, 450 (“Thus, if the works resemble each other so closely as to make it highly unlikely that the challenged work was ‘an accident of independent creation,’ then the similarity ‘is evidence of access.’” (quoting Ty, Inc. v. GMA Accessories, 132 F. 3d 1167, 1170 (7th Cir. 1997))).

<sup>150</sup> See Herzog v. Castle Rock Entm’t, 193 F.3d 1241, 1248–51 (11th Cir. 1999).

<sup>151</sup> See *Selle v. Gibb*, 741 F.2d 896, 901 (7th Cir. 1984) (“[D]irect evidence of copying is rarely available.”). Sometimes, however, such direct evidence exists. See, e.g., *Rogers v. Koons*, 960 F.2d 301, 307 (2d Cir. 1992) (finding that defendant instructed third party to copy the protected work); *Narell v. Freeman*, 872 F.2d 907, 910 (9th Cir. 1989) (finding that defendant “admitted consulting [the plaintiff’s] book during her research and taking ‘language’ from it”).

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Existing explanations for the existence of the independent creation exception in copyright, but not in patent law, take two forms. The first is that granting copyright owners the right to enjoin independently created, substantially similar works would unduly chill speech,<sup>152</sup> in contrast to patent law, which is not about communication.<sup>153</sup> As I have explained elsewhere, however, patent law does indeed have a communicative element to it.<sup>154</sup> Be that as it may, although the intersection between copyright and the First Amendment is a rich topic, I bracket First Amendment concerns raised by copyright protection as being outside the scope of this Article.<sup>155</sup> Another explanation for the existence of the independent creation exception in copyright but not in patent law relies on the rarity with which an independent creation exception would realistically be asserted in copyright law. The argument goes like this (with apologies to its advocates for the necessary simplification I engage in here):<sup>156</sup> Strong property rights are important for encouraging the production of intellectual goods. Rights against independent creation would enhance first-comers' economic return on producing intellectual goods. An independent creation privilege cuts into the potential economic return enjoyed by first-comers. The probability that a second-comer will unwittingly create goods identical or nearly identical to a good already in existence is small in copyright law, since copyrighted goods are idiosyncratic. In patent law, by contrast, the probability that two people will invent the same widget independently is higher, since widgets are functional and there is a discrete number of ways to solve a functional problem. On this argument, incentives to create in copyright law will only marginally be decreased by an independent creation privilege, whereas an independent creation privilege in patent law would too drastically reduce incentives to create and raise administrative costs.<sup>157</sup> All this may well be true, but such an explanation doesn't tell us why the privilege exists in copyright. Even if the privilege persists in copyright because it creates little damage, that still does not explain why it exists at all.

Perhaps there is another explanation. The independent creation privilege vests relief from liability in observers who are unaware of the prior existence of copyrighted goods they independently create. Put another way, copyright imposes a rule of actual notice for liability (at least in theory), whereas patent law imposes a rule of constructive notice. Constructive notice rules require observers to engage in more cognitive processing than do actual notice rules. By holding observers liable only for what they "know," legal rules can lower observers' information costs. Given the large number of goods protected by copyright, prospective creators would face prohibitively high information costs if they were held responsible for searching through the entire set of all copyrighted works. With the privilege, observers need not con-

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<sup>152</sup> See *Narell*, 872 F.2d at 910.

<sup>153</sup> See, e.g., Richard A. Epstein, *The Uneasy Marriage of Utilitarian and Libertarian Thought*, 19 *Quinnipiac L. Rev.* 783, 789 (2000) ("[P]atent law . . . involves invention and not communication.").

<sup>154</sup> See Long, *supra* note 7.

<sup>155</sup> For a few of the many articles discussing this nexus, see Neil Weinstock Netanel, *Locating Copyright Within the First Amendment* *Skein*, 54 *Stan. L. Rev.* 1 (2001); Jed Rubenfeld, *The Freedom of Imagination: Copyright's Constitutionality*, 112 *Yale L.J.* 1 (2002).

<sup>156</sup> See, e.g., Blair & Cotter, *supra* note 148, at 808–12 (presenting argument in greater detail).

<sup>157</sup> See, e.g., *id.* at 810–11 ("having to determine whether [patent] cases involve copying or independent discovery might impose more administrative costs and have a more serious effect upon incentives to invent than in a copyright system").

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duct an exhaustive search to ascertain the full set of copyrighted things.<sup>158</sup> Relief from the burden of exhaustive search is particularly cost-saving when protected goods are new (so that observers must learn about them and do not have a deep stock of knowledge to draw from), when they are easy to create (so that there are many goods to avoid and many observers will also be creators), when they are hard to cognize as things or possess legal boundaries that are hard to define objectively (so that it is not clear what the good is, or which of its attributes are to be avoided), when they are highly idiosyncratic from specimen to specimen (so that it is difficult to make generalizations from one good to another), and when they are ubiquitous throughout society (so that any individual, possessing specialized knowledge or not, is likely to encounter protected goods). Copyrighted goods fit these characteristics.

How broad we think the independent creation privilege should be, however, will depend upon our conceptions of the nature of cognition and knowledge. What does it mean to “know” something? Are defendant second-comers to be held liable only for things they can recount with specificity? If so, then knowledge for independent creation purposes means understanding the world around one in some detail, and creation is an entirely conscious, rational, and deliberative process. If this were the epistemological standard, defendants would quite naturally claim that they had not been exposed to the copyrighted good they were accused of infringing and thus were not aware of it, and even if they had been so exposed they had not thought about the protected good in detail. Such a claim—particularly the part about the defendant’s degree of cognition of the good—would be hard to disprove.

Alternately, we could define knowledge as that which a defendant was at least consciously aware of or could remember. A plaintiff attempting to disprove an independent creation defense would have to prove the defendant affirmatively had access to the plaintiff’s work, whether or not the defendant had scrutinized it in detail. Defendants could still argue that while they may have physically been exposed to the good, they were not mentally exposed: they had forgotten about the existence of the protected good when they were creating their own identical product. Once again, trying to prove or disprove exactly what a person has encountered, and remembers of that encounter at a later precise point in time, is a difficult endeavor.

A third position would be to hold defendants liable for knowledge of goods they had been exposed to or were likely to have been exposed to, whether they could consciously remember the goods or not. Judge Learned Hand wrote of independent creation that “everything registers somewhere in our memories.”<sup>159</sup> Treating the act of creation as calling upon resources buried deep in the subconscious mind of the creator is as plausible a conception of the creative process as any.<sup>160</sup> Such a conception implicitly places the locus of inquiry not on the de-

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<sup>158</sup> Observers might not engage in a search even without the privilege, but the results would still be inefficient. See Landes & Posner, *supra* note 139, at 345–46 (arguing that without an independent creation privilege, authors would still find searching too costly, but that “the costs of enforcing such a regime are socially wasted”).

<sup>159</sup> *Fred Fisher, Inc. v. Dillingham*, 298 F. 145, 147–48 (S.D.N.Y. 1924).

<sup>160</sup> In an example of the subconscious mind making an important creative leap, Friedrich August von Kekule solved the mystery of the structure of benzene, a hexagonal carbon compound that is fundamental to organic chemistry, when he dreamt of a snake biting its own tail. Robert W. Weisberg, *Creativity, Beyond the Myth of Genius* 105–06 (1993).

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defendant's individual circumstances, but on those of a hypothetical person: What would a person like the defendant be reasonably likely to have subconsciously absorbed from the culture? This is how copyright law defines what it means to "know" of a prior work for purposes of the independent creation privilege.<sup>161</sup>

With this broad definition of knowledge in mind, we can examine what the privilege is reasonably likely to accomplish. The groups of observers that the independent creation defense helps—to the extent such a narrow interpretation of what it means to create a work independently helps at all—are avoiders and builders. It does not affect transactors at all. Transactors by definition are interested in learning about particular goods and identifying the owners of the goods. When transactors are accused of infringing, it will be because negotiations over the good have broken down. Transactors will not be able to argue that they were unaware of the existence of the good they are accused of infringing. Builders, by contrast, will be in a position to avail themselves of the defense, because they will be creators in their own right. They will be in a position to benefit from it because they have positive search costs and are unlikely to be knowledgeable of all the works in their field. But with knowledge under the independent creation effectively defined to include everything that has been disseminated into the surrounding culture, builders are likely to be declared to "know" a broad range of works.<sup>162</sup>

Why doesn't an independent creation exception exist in patent law? After all, that is where the most independent creation occurs. A number of reasons militate against it. By denying an independent creation exception to second-comers, the law raises the bar on patentability, requiring inventors to conduct more research and range farther afield in their searches. Research will be more costly to individual researchers, but duplicative research will not be rewarded. Presumably, by forcing inventors to distinguish their inventions from each other, and by not allowing ignorance of prior-invented works to serve as an excuse, we increase social benefit more than we raise inventors' costs. (I say "presumably" because, without empirical evidence, this must remain a theoretical conjecture, however plausible.) But this is an explanation based on creation and distribution of intellectual goods. What about information *about* those goods?

Balanced against the social benefits of denying an independent creation defense are its costs. These costs will not only include additional research costs, but information costs as well. Denying an independent creation privilege to second-comers in patent law raises information costs, but how significant are these increased costs? A moment's reflection reveals that they are not as significant as we might expect, at least where paradigmatic patented goods are concerned.

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Arthur Koestler called this incident "probably the most important dream in history since Joseph's seven fat and seven lean cows." Arthur Koestler, *The Act of Creation* 118 (1964).

<sup>161</sup> See, e.g., *Three Boys Music Corp. v. Bolton*, 212 F.3d 477, 482–83 (9th Cir. 2000) (finding infringement based on subconscious copying); *ABKCO Music v. Harrisongs Music, Ltd.*, 722 F.2d 988, 997–98 (2d Cir. 1983) (same).

<sup>162</sup> See, e.g., *Three Boys Music Corp.*, 212 F.3d 477 (jury found subconscious copying even though the copied work had only been moderately disseminated).

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There are several reasons why search costs in patent law to determine the full set of relevant protected goods are not as high as in copyright. One set of reasons stems from the nature of the protected goods in patent and copyright law, and the existence of other rules affecting the comprehension of these goods. Patent law's requirement of definition and registration of all patented goods lowers search costs, whereas copyright law's eminently reasonable lack of a requirement that all goods be defined and registered raises search costs. Because patented goods can be reduced to a function and because they are relatively more difficult to create than copyrighted goods, observers need search for and understand fewer goods. There are a limited number of ways to solve a mechanical problem, and the ways of solving it yield objective results. Artistic goods, by contrast, do not yield themselves to such objective categorization. As a result, creators of copyrighted goods cannot so easily compare their creations to prior works.

Another set of reasons limiting the information costs of searching for paradigmatic patented goods relative to paradigmatic copyrighted goods is the nature of the relevant observers. Recall that patent law assumes that the relevant set of observers will have a high level of knowledge about the field. If this assumption is accurate and if the relevant class of observers truly is specialized and knowledgeable, they will be able to draw on their preexisting knowledge of goods and technologies in the relevant field and as a result search costs will be lower than if they were not knowledgeable. By contrast, observers of copyrighted goods will often not be a group possessing specialized knowledge, which will raise the costs of searching and cognizing prior works in the field. Finally, the size of the class of observers reasonably likely to infringe in paradigmatic patented goods is smaller than the size of the class of observers reasonably likely to infringe paradigmatic copyrighted goods. Requiring a small set of people to search exhaustively is not as socially expensive as making a large number of people search exhaustively.

### *C. Form-Limiting Strategies*

#### *1. Fixation*

One easy way to reduce information costs is to require that protected goods appear in a readily comprehensible form. Mandating that intellectual goods have a physical embodiment reduces information costs for observers and owners alike, because both sides will have a referent from which to begin their analysis of the protected goods. The fixation requirement in copyright law mandates that a work be fixed in a tangible medium of expression for more than a transitory time in order to qualify for legal protection.<sup>163</sup> Thus a creative work is not

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<sup>163</sup> 17 U.S.C. § 102(a) (2000). An exception to the fixation requirement is live musical performances, which are subject to copyright protection in their unfixed form. *Id.* § 1101(a)(1). Conversely, domestic sound recordings first fixed before February 15, 1972 do not receive federal copyright protection even though they are otherwise eligible subject matter. *Id.* §§ 301(c). Sound recordings by qualifying foreign authors are protected. See *id.* § 104A(h)(6)(C)(ii) (restoring federal protection to sound recordings in the public domain because of preemption by 17 U.S.C. § 301) and *id.* § 104A(h)(8)(A) (denying retroactive restoration to domestic works by defining the source country of a "restored work" as "a nation other than the United States").

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protected unless it is recorded in some manner, and the recording must be in a tangible rather than transitory form.<sup>164</sup>

By requiring that creative works be fixed in order to be protected, copyright law lowers observers' information costs, at least for some goods, without imposing disclosure costs on owners. Observers may not know the exact nature of the creative expression contained in a particular protected work, but they will know that in the case of a book it will be contained on the pages between the covers. The expressive content of a song may be difficult to determine, but observers know that whatever it is, it is contained in the score, the tape, the compact disk, or other medium in which the song appears. The social meaning of a piece of visual art may be contestable, but the physical medium in which it appears (canvas, sculpture, etc.) provides a referent from which to start further analysis.<sup>165</sup>

The fixation doctrine (sometimes) lowers information costs, thereby making it easier for observers to coordinate their actions with owners in two ways. It helps observers comprehend some of the good's attributes, including some of the attributes that constitute its legally protected boundaries. Since all observers are under a duty to avoid, the fixation requirement helps all classes of observers. For paradigmatic goods such as a book, fixation allows observers to identify more easily such characteristics as the author and the length of the book. But even under the best circumstances, it does not convey much more information than that. It does not, for instance, lower information costs along the axis of understanding the content of legal rules. The bundle of rights comprising the entitlement given to copyright owners is more complex than the bundle of rights comprising the entitlement given to patent owners, and fixation does nothing to help observers determine which sticks in the bundle of rights comprising the owner's entitlement they are in danger of infringing.<sup>166</sup>

Fixation, therefore, only gets us so far. Fixation reduces information costs when it provides a comprehensible, tangible, referent for the good. When attributes of the intellectual good are not readily observable from the medium in which it is fixed, however, as is the case with many nonparadigmatic goods, the fixation requirement loses its information cost-reduction function and becomes a makeweight. Such is the case with software and, by extension, with copyrighted materials on the Internet. While a magnetic medium or a silicon chip is clearly tangible, it is difficult to determine the attributes of creative works encoded on them. The doctrinal rule that a computer's random access memory ("RAM") is a tangible medium, and

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<sup>164</sup> Id. §101 (defining fixation). Legislative history indicates what kinds of works are not fixed. Fixation "exclude[s] . . . purely evanescent or transient reproductions such as those projected briefly on a screen, shown electronically on television or other cathode ray tube, or captured momentarily in the 'memory' of a computer." H.R. Rep. No. 89-2237, at 45 (1966) (reporting on H.R. 4347, an earlier version of the 1976 Copyright Act).

<sup>165</sup> Information cost reduction is not the only outcome achieved by the fixation requirement. See Douglas Lichtman, Copyright as a Rule of Evidence, 52 Duke L.J. 683 (2003) (proposing an evidentiary explanation for fixation); Michael Abramowicz, Copyright Redundancy, draft at 21–22 (on file with the Virginia Law Review Association) (proposing a rent-dissipation explanation for fixation).

<sup>166</sup> Compare 17 U.S.C. § 106 (listing the various rights granted to owners, such as the ability to control reproduction of the work, preparation of derivative works, distribution of copies of the work, public performance of certain works, public display of yet other works, and digital audio transmission of sound recordings) with 35 U.S.C. § 271 (2000) (granting patentees the right to prevent others from making, using, or selling the protected good).

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thus loading software into the memory of a computer constitutes fixation (if done by the owner) or copying (if done by an observer), is problematic for precisely this reason.<sup>167</sup> Similarly troublesome is the result that merely browsing material from the Internet constitutes copying, even though no physical structure serves as the observer's referent for the boundaries or concept of the good.<sup>168</sup> The fixation requirement, however helpful in other contexts, does not help observers to identify the protected good in these circumstances.

As the doctrine surrounding the fixation requirement continues to develop, it is not clear which is the cart and which is the horse. When the good is a paradigmatic copyrighted good—a book, musical score, painting, and the like—fixation serves as an easy and effective way to reduce information costs. Rather than being just a pesky nuisance of a statutory requirement, fixation serves a valuable function in reducing information costs. When the goods in question do not easily fit the fixation requirement, however, shoehorning such goods into the fixation requirement does little to reduce information costs. Getting rid of the fixation requirement for all goods, however, would deprive us of a tool that sometimes lowers information costs for observers.

## 2. Tangibility

The impulse toward tangibility can be seen not only in copyright law, but in patent law as well. Historically, patent law emphasized the tangibility of an invention, although tangibility has never been an explicit requirement in U.S. patent law. The notion that an invention needed to be tangible in order to be protected died slowly, lasting well into the nineteenth century.<sup>169</sup> Resistance to protecting processes, especially those with intangible components, was persistent and the desire to ground protection in the tangible aspects of an invention continued to be seen until recently in the case of software patents. In the mid-1990s, the Federal Circuit eased the emphasis on tangibility to allow patentability of computer programs embodied in a tangible medium, such as a floppy disk.<sup>170</sup> Insistence on the existence of a physical

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<sup>167</sup> See, e.g., *MAI Sys. Corp. v. Peak Computer*, 991 F.2d 511, 518 (9th Cir. 1993) (holding that program loaded into RAM was an infringing copy); *Advanced Computer Servs. v. MAI Sys. Corp.*, 845 F. Supp. 356, 362–64 (E.D. Va. 1994) (unauthorized loading of software into computer's temporary memory creates an infringing copy). But see *NLFC, Inc. v. Devcom Mid-America, Inc.*, 45 F.3d 231, 236 (7th Cir. 1995) (computer terminals did not create statutory copies of programs in memory). For an analysis of *Advanced Computer Servs.*, see Jane C. Ginsburg, *Putting Cars on the "Information Superhighway": Authors, Exploiters, and Copyright in Cyberspace*, 95 *Colum. L. Rev.* 1466, 1476 (1995).

<sup>168</sup> Such copying does not make the observer an automatic infringer—the owner may have given permission for the work to be copied, or the observer may be able to avail herself of the fair use privilege.

<sup>169</sup> See, e.g., *Clark Thread Co. v. Willimantic Linen Co.*, 140 U.S. 481, 489 (1891) (“A conception of the mind is not an invention until represented in some physical form.”). British patent law was a little bit ahead of American patent law in this respect. See, e.g., *Boulton & Watt v. Bull*, 126 Eng. Rep. 651, 654 (1795) (confirming grant of improvement process patent to James Watt for a more efficient use of steam in a steam engine because the process was described with sufficient precision).

<sup>170</sup> See *In re Beauregard*, 53 F.3d 1583, 1584 (Fed. Cir. 1995) (noting that the PTO Commissioner found “computer programs embodied in a tangible medium, such as floppy diskettes, [to be] patentable subject matter”); *In re Lowry*, 32 F.3d 1579, 1583–84 (Fed. Cir. 1994) (finding that computer memory containing stored information was an article of manufacture and was thus patentable subject matter).

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structure in which to ground patentability fell in the *State Street Bank & Trust v. Signature Financial Group*, when the Federal Circuit declared business methods patentable.<sup>171</sup>

Any last vestiges of basing protection in tangibility have shrunk to oblivion. The Supreme Court recognized in *Pfaff v. Wells Electronic, Inc.* that “[t]he primary meaning of the word ‘invention’ in the Patent Act unquestionably refers to the inventor’s conception rather than to a physical embodiment of that idea.”<sup>172</sup> The law has moved from the default assumption that any intangible aspects rendered a process unpatentable to the default assumption that processes must be purely abstract before they will be denied protection.<sup>173</sup> The Federal Circuit still refers to the “tangibility” of inventions, even though it does not usually use the word literally.<sup>174</sup>

Like fixation, an object’s tangibility lowers information costs for observers. The tangible embodiment of the invention serves as a referent for its protected attributes. When objects are tangible, the general idea of the object-as-a-thing can be more readily conveyed. Tangibility is not a problem for most inventions. When the invention in question is a process, however, not all (or even any) of its steps will be tangible, and the costs of comprehending the protected intellectual good will often be higher. Of course, one can always find exceptions—a complex tangible machine may be more difficult to understand than a simple but completely intangible process—but the tangible nature of even a complex machine makes it easier to comprehend. In addition to making it easier to cognize things-as-things, tangibility helps us envisage legal relations as something concrete in order to comprehend them better.<sup>175</sup> In the process of trying to cognize property rights, relationships between people are reconceptualized as physical facts or qualities inherent in things.<sup>176</sup> It is unsurprising that tangibility has exerted a strong hold on the judicial mind: it is to be expected that judges and administrative adjudicators, or indeed anyone, when asked to assess an invention, would focus on its tangible aspects.

Ultimately, however, we don’t need a tangibility requirement to lower information costs if the costs are not significant or if legal rules can compensate for high costs in other ways.<sup>177</sup>

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<sup>171</sup> See, e.g., *State St. Bank & Trust Co. v. Signature Fin. Group*, 149 F.3d 1368, 1373 (Fed. Cir. 1998) (holding patentable a process that provides a “useful, concrete and tangible result”).

<sup>172</sup> *Pfaff v. Wells Elecs.*, 525 U.S. 55, 60 (1998).

<sup>173</sup> See, e.g., *AT&T Corp. v. Excel Communications*, 172 F.3d 1352, 1356 (Fed. Cir. 1999) (“[T]he judicially-defined proscription against patenting of a ‘mathematical algorithm,’ to the extent such a proscription still exists, is narrowly limited to mathematical algorithms in the abstract.”).

<sup>174</sup> See, e.g., *id.* at 1353–55 (holding that derivation of a mathematical value was a “tangible” result and that physical structures or physical transformations were not required). For a literal use of the word, see *Scott v. Koyama*, 281 F.3d 1243, 1247 (Fed. Cir. 2001) (“Reduction to practice in the United States requires that the invention be embodied in tangible form in the United States, not simply reported.”).

<sup>175</sup> See Edmund Leach, *Culture and Communication: The Logic by which Symbols are Connected* 37 (1976).

<sup>176</sup> This may help explain the “touch and concern” requirement of real property—that before obligations concerning land can bind third parties they must “touch and concern” the land, and that once connected to land in this way, they “run with” the land. But see A.W.B. Simpson, *A History of the Land Law* 109 (2d ed. 1986) (arguing that “the metaphysical bent of sixteenth century land lawyers” drives the requirement that a “covenant must relate to something in being”).

<sup>177</sup> A tangibility requirement has costs along other margins. Confining protection solely to tangible inventions may adversely affect incentives to create and disclose intangible inventions, which in turn affects social welfare.

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Processes can mentally be reduced to their functional elements, which can save information costs for observers and lead to greater social consensus on the meaning of the invention. By contrast, the aesthetic value of creative works is often harder to define and such definitions will tend to be more idiosyncratic from observer to observer. The need for simple cost-reducing rules, of which fixation is but one, for many creative goods will be more pressing than it will be for many inventions. When the information costs of comprehending intangible goods are high, legal rules can compensate in other ways, such as by shifting information costs from observers onto owners, by forcing owners to disgorge information about the goods, or by lowering the sanction against observers for violating their legal duties. Lowering information costs is not the only reason for the existence of legal rules. Other values—technological progress, investment, stimulation of various human activities, and the usual explanations found in the conventional economic model of intellectual property rights—are also goals that intellectual property rules address. Such considerations may outweigh the need to lower information costs. Nor are legal rules the only way to lower costs. New institutions have been formed to address the limitations and gaps of existing intellectual property regimes, although such institutions have developed in response to transaction costs that arise in bargaining between discrete entities rather than information costs that arise between property owners and the rest of the world.<sup>178</sup>

Nonetheless, the move away from tangibility and the physicality touchstone may help explain why so many commentators feel an instinctive discomfort with such developments as patents on business methods.<sup>179</sup> The information costs of comprehending many patented business methods, particularly when they are composed largely or entirely of intangible steps, are higher than the information costs presented by the kinds of goods—widgets and other simple inventions—around which patent rules historically developed. When information costs for a particular good are high and the class of potentially affected observers is large, then the need for legal rules to reduce information costs by compensating on other margins becomes more pressing. Unlike most patented goods, for which the relevant set of observers is small, patented business methods is a class of intellectual good that has the potential to affect a wide range of observers.<sup>180</sup> Most of these observers will be mere avoiders, those not interested in incurring high information costs to determine all the nuances of patented business methods they are not supposed to infringe.

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<sup>178</sup> See, e.g., Stanley M. Besen et al., *An Economic Analysis of Copyright Collectives*, 78 Va. L. Rev. 383 (1992) (examining the development of copyright collective organizations and how they reduce transaction costs in intellectual property licensing); Stanley M. Besen & Sheila Nataraj Kirby, *Private Copying, Appropriability, and Optimal Copying Royalties*, 32 J.L. & Econ. 255 (1989); Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 Cal. L. Rev. 1293 (1996) (surveying an array of institutions that have developed to address transaction cost problems in intellectual property markets).

<sup>179</sup> Critics of the patentability of business methods are legion. For one critique, see Leo J. Raskind, *The State Street Bank Decision: The Bad Business of Unlimited Patent Protection for Methods of Doing Business*, 10 Fordham Intell. Prop. Media & Ent. L.J. 61 (1999).

<sup>180</sup> See Scott Thurm, *Online: A Flood of New Patents Stirs Up a Dispute over Tactics*, Wall St. J., Oct. 9, 1998, at B1.

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### III. IMPLICATIONS

In this Part, I discuss some of the implications of the responses of rules to information costs. I argue that intellectual property forms respond to the information costs presented by paradigmatic goods. When nonparadigmatic goods are assigned to intellectual property forms, legal rules that previously reduced information costs may no longer do so. As intellectual property law develops, it will become increasingly important to examine the effect of legal rules on information costs. I then propose that when we consider importing doctrinal rules from one area of intellectual property law into another, we also need to examine their effects on the production and distribution of information about the good.

#### *A. The Persistence of “Thingness”*

Let me now revisit a question I posed earlier: Why do layfolk insist on thinking of property as “things that are owned by persons?”<sup>181</sup> Things serve as convenient referents, or proxies, for much more complex relationships. “Thingness” is a mental model shared by a group of people, in this case layfolk, that reduces the costs of processing information.<sup>182</sup> Observers will economize on information processing costs. Some observers will economize more than others, depending upon their interests and their tolerance for incurring costs. Most observers in most propertarian relationships simply want to fulfill their duties of avoidance.

Legal rules can work to a greater or lesser extent to take advantage of the information costs savings created by mental models. If heuristics such as thingness are “the internal representations that individual cognitive systems create to interpret the environment,” the structure of legal rules is an example of one of “the external (to the mind) mechanisms individuals create to structure and order the environment.”<sup>183</sup> When legal rules take into account the structure of commonly shared mental models, they can achieve more efficient results than when they do not. In intellectual property, legal rules such as fixation that create “thingness” by making the boundaries and qualities of protected goods (however intangible) easier to comprehend will lower compliance and enforcement costs.

#### *B. The Fit Between Assets and Forms*

What are the practical payoffs of examining patent and copyright through the lens of information costs? The profile of information costs presented by protected goods has real implications for the structure of intellectual property forms. Because information costs are very real, particularly in intellectual property, we need to look closely at the nature of intellectual goods, the information cost profiles they present, and how legal rules distribute such costs. When the general concept of a patented item such as a widget is easy to comprehend, the draconian structure of sanctions that patent law imposes on observers for infringement will not be as burdensome as when the good is irreducibly difficult to define and comprehend. Most

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<sup>181</sup> Grey, *supra* note 14, at 69.

<sup>182</sup> See Andy Clark, Economic Reason: The Interplay of Individual Learning and External Structure, *in* *The Frontiers of the New Institutional Economics* 269–90 (John N. Drobak & John V.C. Nye eds., 1997) (examining the relationship between institutions and cognitive processes in forming a framework for decisionmaking); Arthur Denzau & Douglass C. North, Shared Mental Models: Ideologies and Institutions, 47 *Kyklos* 3 (1994) (same).

<sup>183</sup> Denzau & North, *supra* note 182, at 4.

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paradigmatic patented goods are more readily measurable and easier to reduce to a function and convey conceptually than most nonparadigmatic ones.<sup>184</sup> When we move away from patenting paradigmatic items to protecting nonparadigmatic and (often) more subjectively defined items like business methods or sports moves, the cognitive requirements that patent rules impose on observers increase. The more subjective the concept and boundaries of the good, the greater are observers' information costs of understanding what they are forbidden to do.

The patent and copyright rules I've discussed are geared toward dealing with the information costs presented by *paradigmatic* goods. There is a reason I've referred to "paradigmatic goods" throughout this Article. Paradigmatic intellectual goods present information cost profiles different from those presented by nonparadigmatic ones. Widgets are tangible. Their tangibility helps observers recognize their physical attributes. Similarly, there is a general social recognition of what a book or picture is. Understanding what an asset is—understanding things-as-things—helps lower the costs of determining what attributes are protected.

Intellectual property forms can best reduce information costs when they are comprised of legal rules geared to the kinds of cognitive problems presented by protected goods. In the last Part, I examined some key differences in the structures of patent and copyright law and presented an explanation for these differences based on the presence of information costs. I showed how structural differences in each form of protection respond to the kinds of information costs presented by paradigmatic patented and copyrighted goods. Much of the structure of the patent and copyright forms of protection was developed at a time when the only protected goods were paradigmatic goods. In the formative years of the development of U.S. patent and copyright law, as Professor Robert Merges has said, "if you put technology in a bag and shook it, it would make some noise."<sup>185</sup>

What happens when nonparadigmatic goods are assigned to the patent or copyright forms of protection? When the nature of the goods assigned to the various forms changes, but the legal rules comprising the forms do not, mechanisms that previously reduced information costs may no longer do so when applied to the new kinds of protected goods. When nonparadigmatic assets such as software or sports moves are assigned to intellectual property forms comprised of rules designed for paradigmatic assets, rules that normally reduce net information costs can raise them instead. Franny must describe her patented business method in detail, which imposes costs on her, but the thick description does little to reduce Jerry's information costs. He won't be able to see a picture of it or handle a tangible model of her invention. The legal rules remain in place, requiring her to describe the invention, while allowing her to get away with creating an ambiguous if detailed description.<sup>186</sup> Jerry will still

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<sup>184</sup> For examples of patents on nonparadigmatic goods, see Stephanie Louise Brown, Method of Preventing Repetitive Stress Injuries During Computer Keyboard Usage, U.S. Patent No. 5,638,831 (issued June 17, 1997) (claiming a series of bodily movements); Dale D. Miller, Method of Putting, U.S. Patent No. 5,616,089 (issued April 1, 1997) (claiming a sports move involving a series of bodily movements).

<sup>185</sup> Merges, *supra* note 106, at 585.

<sup>186</sup> Admittedly, patentees can attempt to create ambiguity when describing any invention so as to ensure the greatest possible scope of rights for themselves later, should the patent be litigated. The burden is on the U.S. Patent Examiner to require clarification of ambiguous patent language. Examiners work under tremendous time constraints, which

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be held strictly liable for infringement, even if his costs of determining what was protected are high.

The disjunction between nonparadigmatic assets and the structure of intellectual property forms may explain why many commentators feel an instinctive discomfort with patents on business methods. The traditional economic analysis of the function of patents, which relies on incentives and distribution, fails to answer why allowing patents on business methods seems instinctively wrong to so many commentators. Will patents on business methods provide incentives to create and disclose business methods, the benefit of which will outweigh the costs of protection? Perhaps we instinctively believe the cost of protection to be higher than the benefit (and maybe it is), but who can say for sure? That is an empirical question, for which we do not currently have data.

Examining business methods through the lens of patent doctrine yields no better answer as to why so many people feel uncomfortable with patent protection for this type of asset. Allowing patents on business methods flowed readily from precedent, as the Federal Circuit discovered in *State Street Bank & Trust Co. v. Signature Finance Group*, when it could find no doctrinal reason that business methods should not be patentable.<sup>187</sup> As Judge Rich notes, “Application of this particular exception has always been preceded by a ruling based on some clearer concept of [the patent statute] or, more commonly, application of the abstract idea exception based on finding a mathematical algorithm.”<sup>188</sup>

Appeals to history or tradition don’t answer the question either, at least not if we approach it in terms of incentives to create and distribute goods. As Professor Robert Merges writes:

[T]he canonical patented technology in the eighteenth century was a simple agricultural tool (an axe or a plow) which then became a more complex implement (a cotton gin or reaper) in the nineteenth century; even later, it became a machine, electrical device, or chemical process. These are true, but useless, historical facts; they say nothing about the appropriateness of patenting modern business concepts.<sup>189</sup>

Fair enough. If we are thinking only in terms of optimizing the creation and distribution of one resource or another, examining which assets have historically been protected by patent law does not shed light on the appropriateness of patenting business methods.

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means most patents do not receive the time and attention they should. See Lemley, *supra* note 66. When the invention is inherently hard to define and measure, however, strategies to build ambiguity into the patent will be even more successful than if its qualities were easily observed.

<sup>187</sup> “Since its inception, the ‘business method’ exception has merely represented the application of some general, but no longer applicable legal principle.” *State St. Bank*, 149 F.3d 1368, 1375 (Fed. Cir. 1998).

<sup>188</sup> *Id.*

<sup>189</sup> Merges, *supra* note 106, at 584.

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Information costs may provide an answer to the problem. If we look at the kinds of assets that have historically been protected and how intellectual property forms have developed around them to reduce such costs, we can better understand why problems arise when new assets are assigned to existing forms. Business methods present information cost profiles different than that of the paradigmatic widget. It is often harder to determine the boundaries of a new and nonobvious (intangible) business method than it is to determine the boundaries of a new and nonobvious (tangible) coffee mug—or complex machine, for that matter. Inventions that are tangible, or that can be expressed in a tangible embodiment or represented by a picture, present lower information costs to observers than those that are not. When information costs are high, a strict liability regime bereft of privileges is harsh. The patent form of intellectual property protection, with its strong duties of information disclosure paired with strong remedies for infringement, simply was not designed to respond to the information cost profiles presented by business methods. The search costs to observers are high, and the penalties too great given the high search costs. The mental resources that go into understanding this type of asset, which lacks a tangible embodiment, will be significant. The relevant audience will be large. Many observers—the large class of people using or affected by business methods—potentially will have to understand at least enough about the protected aspects of the business method to avoid it. Patent law's constructive notice rule, coupled with its lack of general privileges, places a high cognitive burden on observers.<sup>190</sup> Quite simply, patent rules were designed to deal with assets that presented different information cost problems than those presented by business methods.

Examining the efficiency implications of information costs may help explain some commentators' discomfort with other recent developments in intellectual property rights. It may explain why some assets have never been encompassed within the scope of intellectual property or common law rights in information.<sup>191</sup> It sheds new light on the effects of protecting any asset, such as software, under more than one form. The overlap between intellectual property regimes presents higher information costs to observers, who must determine which attributes of a good are protected by which regime. An information cost approach also emphasizes the importance of tailoring the structure of the property form to the information costs presented by protected goods. Some goods present higher information costs than others. Other goods may present similar costs but the relevant class of observers will be interested in different kinds of information about the good and have higher or lower tolerance for incurring information costs. Intellectual goods that are difficult to define or describe objectively will impose high information costs when they are assigned to a property form that requires detailed description or definition. Privileges, if properly structured, can reduce information costs when intellectual goods are hard to discover or discern but easy to infringe inadver-

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<sup>190</sup> The privilege for prior users of patented business methods—commonly called “prior users’ rights”—only marginally reduces information costs for observers because it is available only to individuals accused of infringing a patented business method who started using the method more than one year before it was patented. See 35 U.S.C. § 273 (2000). The privilege does not reduce the information costs of comprehending the patented method, nor does it reduce avoidance costs for anyone other than prior users—a very small subset of observers.

<sup>191</sup> See Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 Emory L.J. 1025, 1036 (1990) (noting that no satisfactory explanation has been proposed for the exclusion of mathematical formulae and mental processes from the realm of patentable subject matter).

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tently. There is no simple solution to the tension that arises when nonparadigmatic intellectual goods present a pattern of information costs that the structure of patent and copyright forms were not designed to address.

The answer might seem to be to assign a good to a given property form based on the information cost profile the good presents. For example, if business methods are hard to define and easy to create, then why not assign them to the copyright form of protection? The ease of creating business methods, coupled with the large size of the class of potential observers, most of whom will be avoiders rather than builders, would seem to militate in favor of a form of protection containing mechanisms to lower search costs. Copyright fits this profile. So why not match up goods with forms of protection so as to minimize information costs? A moment's reflection reveals why goods can only be assigned to certain forms. The patent and copyright forms' primary purpose is to protect different bundles of a good's attributes. Patent law protects the bundle of a good's attributes that we define as making the good new, useful, and nonobvious, while copyright law protects the bundle of attributes that we define as the good's creative expression. Some goods, such as computer software, are protected under both forms. Others, such as business methods, cannot be feasibly protected under copyright because it would be silly to protect the expressive attributes of a business method. Primary concerns of protecting attributes that stimulate optimal creation and distribution of intellectual goods, rather than secondary concerns about the creation and distribution of information about those goods, are the drivers of how (and whether) goods get assigned to forms.

So why not create new forms of protection that optimize both production of goods and of optimal distribution of information about the goods? Why not create a *sui generis* form of protection for (say) business methods that protects new and nonobvious attributes but contains privileges that lower observers' search costs? For that matter, why not create a unique form of protection for each intellectual good, tailored to that good's information cost profile?<sup>192</sup> Tempting as such solutions can be,<sup>193</sup> it's not clear that creating new forms of protection results in lower net information costs. *Sui generis* forms of protection raise information costs along one margin—that of comprehending legal rules—but may or may not lower the information costs associated with goods themselves. Observers, not to mention owners and adjudicators, will affirmatively incur information costs learning about the contours of more forms of protection, whereas observers' information costs savings along other margins are not guaranteed to offset these increased costs.

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<sup>192</sup> See, e.g., J.H. Reichman, Legal Hybrids Between the Patent and Copyright Paradigms, 94 Colum. L. Rev. 2432 (1994) (discussing hybrid intellectual property forms).

<sup>193</sup> See, e.g., Rochelle C. Dreyfuss, Information Products: A Challenge To Intellectual Property Theory, 20 N.Y.U. J. Int'l L. & Pol. 897 (1988) (arguing for a *sui generis* form of protection for computer programs); Jane C. Ginsburg, Copyright, Common Law, and *Sui Generis* Protection of Databases in the United States and Abroad, 66 U. Cin. L. Rev. 151, 171–76 (1997) (arguing in favor of a new form of intellectual property protection for databases); Peter S. Menell, Tailoring Legal Protection for Computer Software, 39 Stan. L. Rev. 1329, 1364–67, 1371 (1987) (same); J.H. Reichman & Pamela Samuelson, Intellectual Property Rights in Data?, 50 Vand. L. Rev. 51, 64–76 (1997) (discussing *sui generis* protection for databases); Pamela Samuelson et al., A Manifesto Concerning the Legal Protection of Computer Programs, 94 Colum. L. Rev. 2308, 2404 (1994) (advocating *sui generis* protection for computer programs).

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Altering the legal rules that comprise existing patent and copyright forms of protection to accommodate nonparadigmatic goods also raises information costs along some margins while lowering them along others. Modifying legal rules within forms to accommodate nonparadigmatic goods, and then applying the same rules to all goods, paradigmatic and nonparadigmatic alike, may not economize on information costs any more than the status quo. Adding rules within forms to accommodate high information-cost goods presents many of the same problems as *sui generis* protection. It also forces adjudicators to measure the information costs presented by a good (a high measurement cost attribute in its own right), along with the other attributes of the good. In the end, we need to keep in mind that any change in legal rules will impose both benefits and costs, some of them unintended and unforeseen. Whether changes are worth it depends on whether the benefits of additional refinement outweigh the costs.<sup>194</sup>

### *C. On Doctrinal Importation*

I close with a warning about the dangers of importing mechanisms from one intellectual property form into another. Commentators have suggested that various privileges or liability rules ought to be imported into patent law.<sup>195</sup> After all, if they work in copyright, why not in patent law? Similarly, in some areas copyright's remedies are becoming harsher, developing to look more like those of patent law.<sup>196</sup> Before we can know whether such—or indeed any—transplants will work, we need to examine not just how they affect the creation and distribution of intellectual goods, but also how they affect the creation and distribution of information *about* those goods.

Any change in the fundamental structure of the legal rules comprising the patent and copyright forms has potential implications for the creation and distribution of information about intellectual goods. Still, it is not always clear when legal rules ought to step in to respond to information problems and how they ought to do so.<sup>197</sup> Not every information imperfection should be corrected. In an uncertain world, rational decisionmakers acquire only a limited amount of information before making choices. At times we may desire less information rather than more.<sup>198</sup> The marginal cost of any bit of information consists of the returns foregone in obtaining it. Information about intellectual goods is costly to produce and to disseminate, and at some point it presents diminishing marginal returns.

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<sup>194</sup> See R. Quentin Grafton et al., *Private Property and Economic Efficiency: A Study of a Common-Pool Resource*, 43 *J.L. & Econ.* 679, 709–10 (2000) (analyzing the gains from increasing the efficiency of a regulatory system).

<sup>195</sup> See, e.g., Maureen A. O'Rourke, *Toward a Doctrine of Fair Use in Patent Law*, 100 *Colum. L. Rev.* 1177 (2000) (proposing a fair use exception for patent law); Simone A. Rose, *On Purple Pills, Stem Cells and other Market Failures: A Case for a Limited Compulsory Licensing Scheme for Patent Property* (Wake Forest Pub. Law and Legal Theory Research Paper Series, Research Paper No. 03-07, March 2003).

<sup>196</sup> See, e.g., 17 U.S.C. §1201(a)(1) (2000) (banning circumvention of technological measures designed to control access to protected works); *Id.* § 1201(b)(1) (banning trafficking in devices circumventing access to protected works).

<sup>197</sup> See Alan Schwartz & Louis L. Wilde, *Intervening in Markets on the Basis of Imperfect Information: A Legal and Economic Analysis*, 127 *U. Pa. L. Rev.* 630 (1979).

<sup>198</sup> See Mark Kelman, *Problematic Perhaps, But Not Irrational*, 54 *Stan. L. Rev.* 1273, 1286 (2002) (“[I]ncreased information can certainly be counterhedonic . . . . A rational utility maximizer would surely seek *less* information in some situations.”).

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Some information about intellectual goods will be apparent from a casual inspection of the product itself or will be revealed by owners voluntarily without the goad of legal rules. When the observers are transactors and the owners are interested in transacting, relevant information about intellectual goods is likely to be thickest even when legal rules do not compel owners to disclose it. Even if owners are not interested in selling the intellectual goods they own, they may still wish to make information about their intellectual goods available for other reasons, such as enhancing their reputations in other areas. When information is not revealed by owners, it may be offered by independent third parties. Observers may benefit from the information-gathering activities of other observers, either directly through public commentary or indirectly through product or producer reputations. And of course trademarks serve as mechanisms that reduce information costs by allowing transactors to take advantage of the economies of experience.<sup>199</sup>

#### CONCLUSION

My purpose in this Article has been both to fill some of the gaps in our positive theories of patent and copyright law and to provide a basis for a more nuanced understanding of the patent and copyright forms. Intellectual goods will impose information costs on observers. Legal rules can provide observers with a framework for cognizing the contours of the proprietarian relationship and help them process complex information. By tailoring the strategies used to address the kinds of information costs presented by intellectual goods, legal rules can address information imperfections and coordination problems between property owners and the rest of the world.

Taking account of information costs can help provide explanations for phenomena in the intellectual property realm that were previously unexplained, can alter our view of the functions and roles of patent and copyright rules, and perhaps most importantly, can help us rethink some of the effects of intellectual property rights. The presence of information costs can help explain why, for example, although independent creation of inventions is far more likely than independent creation of artistic works, the privilege exists precisely where it will be rarely needed and is absent where it would do the most work. It should also cause us to think carefully about the interconnections among mechanisms within each form, such as the relationship between descriptive requirements (or their lack) and legal privileges. Finally, examining the patent and copyright forms through the lens of information costs can help us analyze recent developments in intellectual property law and provide guidance on the way in which the law ought to evolve.

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<sup>199</sup> See Phillip Nelson, *Information and Consumer Behavior*, 78 *J. Pol. Econ.* 311, 319 (1970) (describing experience goods and search goods).