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An Economic Model for the Incentive/Access Paradigm of Copyright Propertization: An Argument in Support of the Orphan Works Act

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An Economic Model for the Incentive/Access Paradigm of Copyright Propertization: An Argument in Support of the Orphan Works Act

by

SAMI J. VALKONEN* & LAWRENCE J. WHITE ** ***

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I. Introduction

A. Background and Contention of Article

The "Orphan Works Act of 2006" was introduced in Congress in September 2006 as part of broader copyright reform legislation under the heading "The Copyright Modernization Act of 2006." Although the 109th Congress did not pass the legislation, it is expected to be picked up in 2007, and its likelihood of passage is considered good.

The Orphan Works Act is based directly on a January 31, 2006, "Report on Orphan Works" by the Copyright Office. The Report uses the term "orphan works" to describe a situation where the owner of a copyrighted work cannot be identified and located by someone who wishes to make use of the work in a manner that requires the permission of the copyright owner. The Report makes a specific proposal for a new Section 514 to be added to the Copyright Act, which has now been introduced as the Orphan Works Act. The main operative provision of the act is limiting the liability of the user of an orphan work (as defined in the Act) to "reasonable compensation." The Act also generally precludes injunctions against copyright users of orphan works, thereby softening the typical property rule running through the Copyright Act to a liability rule.

The goal of this article is to analyze the Orphan Works Act from an economic viewpoint. To accomplish this, the article proposes an economic model that can be used as a conceptual backdrop by policymakers for analyzing the output implications of changes to copyright law. The model is based on the dominant view that the maximization of societal welfare through output—i.e., creation and dissemination of works of authorship—is the constitutionally mandated objective of the copyright regime. Acceptance of this neo-utilitarian policy objective implies that, just as antitrust protects "competition, not competitors," the copyright regime should protect

2. Panel discussion "Copyright 'Modernization': What Is the Agenda on Capitol Hill?" organized by the Progress & Freedom Foundation in Washington, D.C. on October 20, 2006; speakers David Jones, Counsel, Senate Judiciary Subcommittee of Intellectual Property; Joe Keeley, Counsel, House Judiciary Subcommittee on Courts, the Internet and Intellectual Property; and Amy Levine, Legislative Counsel, Rep. Rick Boucher (D-Va).
4. Id. at 1.
creativity, not creators. Protecting creativity often is consistent with protecting creators, but it recognizes the need to distribute the incentives for creation beyond the physical authors of the works to constituencies that make creativity possible. Fundamentally, under this positive law philosophy the proper scope of copyright becomes a balancing test where Congress should expand or limit the property grant claimable under the Copyright Act\(^6\) based on the output effects of the change.

The conclusion of the article is that the Orphan Works Act is consistent with the objectives of the copyright system and that it should be approved into law.

B. Structure of Article

This article starts in Part II with a discussion of the theoretical foundations of copyright and an analysis of the Constitutional mandate for the United States copyright regime. The article adopts the majority view that the drafters of the Constitution expressly intended copyright to serve a society by creating incentives for the creative community to maximize the output of copyrighted works. The subsequent economic modeling is based on the notion that the objective of the copyright regime is to maximize societal welfare by optimizing copyright to induce the supply side to creative expression.

Part III starts with a summary of the incentive-access paradigm and introduces some of the economic models of intellectual property in the economics literature. A more detailed review of the model by Professor William Landes and Judge Richard Posner in their recent book *The Economic Structure of Intellectual Property Law*\(^7\) is presented. After observing some key notions contained in the Landes/Posner model, the article then discusses some of the infirmities of their presentation.

Part IV then presents an alternative output-maximizing economic model for copyright—an exposition of the incentive-access paradigm. The model presented is specifically designed to identify the social welfare maximizing value of \(z\), a factor that Landes and Posner assign to the level of statutory propertization of intellectual rights.

Part V applies the new model to the Orphan Works Act. The article concludes in Part VI that the Orphan Works Act would

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increase the output of copyrighted works thereby increasing societal welfare, and as such the Act should be implemented.

II. The Objective of Copyright

In order to build an economic model for a copyright regime it is necessary to have a quantifiable measure for the objective of the desired societal outcome. Since policy decisions by Congress on the scope of copyright protection are bound by the Constitution, we begin the discussion by analyzing the Constitutional mandate for the copyright system.

A. Foundations of Copyright

The two prevalent legal theories on the foundation of copyright are the natural law and positive law schools. The fundamental policy distinction between the two philosophies is that under the former, the primary policy focus is the protection of the authors' rights whereas in the latter the focus is society's broader interests.

The natural law foundation for copyright is based on the 17th century work of the legal philosopher John Locke, specifically his labor theory of property acquisition. According to Locke, a man's "labor being the unquestionable property of the laborer, no man but he can have a right to what that is once joined to, at least where there

8. L. Ray Patterson, Nimmer's Copyright in the Dead Sea Scrolls: A Comment, 38 Hous. L. Rev. 431, 434 (2001) ("Lawmakers, legislative or judicial, simply cannot allocate rights between [the different interest] groups in a reasonable way without common premises to provide the basis for the allocation").

9. Some commentators also acknowledge a separate "just reward" theory of copyright. Mark S. Nadel, How Current Copyright Law Discourages Creative Output: The Overlooked Impact of Marketing, 19 Berkeley Tech. L.J. 786, 794 (2004). The "just reward" theory, however, does not purport to explain why copyright exists. It is more properly seen as a theoretical approach to copyright within the positive law school.

10. The positive law/natural law divide has been extensively examined by professors L. Ray Patterson and Craig Joyce, both separately and together. See, e.g., Craig Joyce, "A Curious Chapter in the History of Judicature": Wheaton v. Peters and the Rest of the Story (of Copyright in the New Republic), 42 Hous. L. Rev. 325, 360 (2005); L. Ray Patterson and Craig Joyce, Copyright in 1791: An Essay Concerning the Founders' View of the Copyright Power Granted to Congress in Article I, Section 8, Clause 8 of the U.S. Constitution, 52 Emory L.J. 909, 924 (2003); L. Ray Patterson, What's Wrong with Eldred? An Essay on Copyright Jurisprudence, 10 J. Intell. Prop. L. 345, 345 (2003). Some commentators consider moral rights as a separate foundation, but the majority view is that moral rights are a key attribute of the natural law philosophy. See, e.g., Patty Gerstenblith, Architect as Artist: Artists' Rights and Historic Preservation, 12 Cardozo Arts & Ent. L.J. 431, 439 (1994) ("The copyright/moral rights distinction is founded on an underlying difference between positive law and natural law").

11. See, e.g., Patterson, supra note 8, at 434.
is enough, and as good, left in common for others."

Under a natural rights approach there exists an “inherent”—i.e., natural—right to the work by the author that is not subject to polity limitation based on the broader interests of society. The commonly recognized inalienable rights under a natural law theory are the key moral rights of attribution, integrity, and disclosure, as well as the right to withdraw the work from the public and to receive protection from excessive criticism.

The natural law philosophy was challenged when England abolished the prior Stationers’ Company monopoly and enacted the Statute of Anne in 1710. The Statute of Anne represented a societal determination that copyright should be viewed as a statutory trade regulatory tool that has the objective of maximizing societal welfare.

Through its premise that copyright exists for “the encouragement of learning,” the Statute of Anne is widely seen as being the first copyright regime to view copyright from a broader societal vantage point. In England the House of Lords’ 1774 decision in Donaldson v. Beckett is considered the final straw in affirming that copyright exists only through polity grace as a statutory property grant subject


13. In fact, Locke derives the grant of the right from God, so the term “natural right” is misleading in that the claimed right according to the Lockean school originates from a supernatural source.

14. Peter Read Teachout, The Soul of the Fugue: An Essay on Reading Fuller, 70 MINN. L. REV. 1073, 1117 (1986) (“[T]he natural law approach...takes the view that law is the reflection of eternal principles which exist above and apart from whatever the state or the sovereign may choose to do”).

15. See, e.g., Monica E. Antezana, The European Union Internet Copyright Directive as Even More than it Envisions: Toward a Supra-EU Harmonization of Copyright Policy and Theory, 26 B.C. INT’L & COMP. L. REV. 415, 421 (2003) (explaining how moral rights under a Continental natural right regime are inalienable as an “extension of the author’s personality”). It is unclear, however, why limiting the alienability of rights is necessarily in the interest of the author.


17. Statute of Anne, 1710, 8 Ann., c. 21 §1 (Eng.).

18. Craig W. Dallon, The Problem with Congress and Copyright Law: Forgetting the Past and Ignoring the Public Interest, 44 SANTA CLARA L. REV 365, 409 (2004) (“The important point is this: the Statute of Anne, the ancestor of American copyright law, had as its foremost objective the encouragement of learning—a general public interest—not the private economic interests of authors, printers, or publishers”).


20. 1 Eng Rep. 837, 842 (H.L. 1774).
to the scope restrictions determined by the grantor: the government, based on social policy.\textsuperscript{21}

The 18th century English developments in the Statute of Anne and Donaldson v. Beckett inspired the positive law school of copyright, which enshrines copyright as a utilitarian societal tool to preserve incentives for creators of works of authorship to ensure a sufficient flow of copyrightable works for the benefit of society. An important addition, however, is the need to also ensure proper alienability for copyrighted works so that a market of creative expression can evolve. The statute thus recognizes that inducement of creation needs to be paired with dissemination of works to consumers. A strict interpretation of the positive law philosophy would allow the polity freely to assign the property grant given to authors without regard to a moral argument that the author should have rights simply as a result of being the creator.

Although modern copyright systems have attributes of both premises, the positive law versus natural law schism persists in copyright today, as it does in other areas of law.\textsuperscript{22} As a general notion the old English colonies, as a result of the direct influence of the Statute of Anne, tend to be more positive law biased whereas the Continental European systems continue to heed their natural law origins.\textsuperscript{23} It will remain to be seen how in the increasingly globalized world of the Internet the two copyright systems that result in different policy outcomes can coexist.\textsuperscript{24}

\textsuperscript{21} See, e.g., Joyce, supra note 10, at 331 (the case determined copyright “to be a creature of statutory grant alone”); see also, Joseph J. Beard, Everything Old Is New Again, 38 Loy. L.A. L. Rev. 19, 38 (2004) (“If there had been a common law copyright in published works before the Statute of Anne, Donaldson v. Beckett declared it was no more”).

\textsuperscript{22} Teachout, supra note 14, at 1117 (analyzing Lon Fuller’s jurisprudential writings noting how “the schism between the philosophers of natural law and the legal positivists has been deep and largely unbridged for decades”).


\textsuperscript{24} The modern natural law proponents in Europe defend the theory on a political argument that authors’ rights need to be expanded to prevent the weak initial bargaining power of the individual authors to be exploited by large companies acquiring copyrights. Commenting on the relative strengths and weaknesses of the European social model is beyond the scope of this article. As to the coexistence, it would seem necessary that just as common law and civil law are melding, especially in European Union law, the same would need to happen with the different traditions of copyright law.
The following discussion explains this article’s premise of treating the Constitution as mandating a fundamentally positive law regime where Congress’ goal is to maximize output of copyrightable works rather than protect the interests of any specific interest group. This is not intended to deny that there are noticeable strains of natural law elements in the Copyright Act. However, and while recognizing the existence of opposing views, the model presented in this article subscribes to the majority view that the Copyright Clause of the United States Constitution is fundamentally utilitarian as the basis for the economic analysis.

25. E.g. 17 U.S.C. §106A (granting a “moral right” to visual artists); 17 U.S.C. §203(a)(5) (limiting authors’ rights to sell their copyrights).


27. U.S. CONST. art. I, § 8, cl. 8 (“To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Rights to their respective Writings and Discoveries”)

B. Jurisprudence on the Constitutional Mandate for Copyright

At the time of writing the Constitution the Founders understood both the natural law and positive law theories, and there is substantial support that their choice of a positive law foundation was deliberate. Thomas Jefferson is known to have openly rejected a natural rights theory for copyright in his correspondence. Although less openly so, James Madison is also seen as having expressly rejected any natural law rights of authors.

A utilitarian foundation for the copyright regime has been confirmed by the Supreme Court on several occasions. In its 1954 decision in *Mazer v. Stein*, the Court explained the economic philosophy behind the Copyright Clause by stating that "the encouragement of individual effort for personal gain is the best way to advance public welfare through the talents of authors and inventors." Presumably the Court also encompassed in its definition of "authors" the broader creative community and various constituencies that enable creativity by providing financing and dissemination to works of authorship, such as film studios and book publishers. The Court expressly recognized that the incentive to profit is the engine that drives copyright output, but that these profits are a means, and not an end, to the ultimate Constitutional objective of welfare maximization.

The teaching of *Mazer* was reaffirmed multiple times in the Supreme Court's 1984 *Sony* decision. The Court stated that "[t]he enactment of copyright legislation by Congress under the terms of the Constitution is not based upon any natural right that the author has in interest of authors.")}; Dallon, *supra* note 18, at 423 ("The Constitution adopted the utilitarian, public benefit rationale for copyright protection over the property right rationale.").

29. Patterson & Joyce, *supra* note 10, at 930. Professors Patterson and Joyce appear to use common law copyright to describe a natural law based foundation. Common law copyright, however, suggests that the issue is whether the law is codified (statutory law) or judicial (common law). The focus, however, is whether copyright exists as a matter of polity grant (positive law) and remains subject to polity limitation for the benefit of societal welfare or whether copyright rights are "inherent" (natural law).

30. Graham v. John Deere Co. of Kansas City, 383 U.S. 1, 8-9 (1966) ("[Jefferson] rejected a natural-rights theory in intellectual property rights and clearly recognized the social and economic rationale of the patent system. The patent monopoly was not designed to secure to the inventor his natural right in his discoveries. Rather, it was a reward, an inducement, to bring forth new knowledge").

31. Dallon, *supra* note 18, at 424 (stating that Madison's writings "clarify that he did not believe in perpetual common law copyrights rooted in the natural law rights of authors").


his writings, . . . but upon the ground that the welfare of the public will be served and progress of science and useful arts will be promoted by securing to authors for limited periods the exclusive rights to their writings." 34 The Court concluded that "[t]he sole interest of the United States and the primary object in conferring the monopoly lie in the general benefits derived by the public from the labors of authors." 35 Again, presumably the "labors of authors" language is intended to encompass the investments made in creative works by constituencies beyond the physical individual "laborer" artist.

Since Sony the Supreme Court has emphasized further the profit motive as a key component of the social equation. 36 Ensuring that investment by the industries that are responsible for the vast majority of the economic output from copyrighted content—i.e., film studios, record companies and book publishers—is maintained is an important part of the social function. Therefore, appropriate focus on the profit motive of producers of copyrighted works is not inconsistent with the social welfare maximization objective.

C. History and Expansion of the Breadth and Length of Copyright

Throughout the past two centuries the property grant of copyright claimants has substantially expanded. The first copyright legislation in the United States, the Copyright Act of 1790, was a "scant two or three pages," compared to the present Act, which "weighs in at more than two hundred densely packed pages." 37 This increase in volume has not only added complexity to the law, 38 but also substantially expanded its substantive reach.

The subject matter of copyright in the original Act of 1790 included only maps, charts, and books but then over time expanded to a list of specific categories of works. 39 Despite the current

34. Id. at n.10 (quoting H.R. Rep. No. 60-2222, at 7(1909)).
35. Id. at 432 (quoting Fox Film Corp. v. Doyal, 286 U.S. 123, 127 (1932)).
38. Recent amendments of the Copyright Act are extremely long and complex, and therefore arguably difficult to implement. See also David Nimmer, Ignoring the Public, Part I: On the Absurd Complexity of the Digital Audio Transmission Right, 7 UCLA ENT. L. REV. 189 (2000) (discussing the opacity of recent statutes governing digital audio transmissions); David Nimmer, Codifying Copyright Comprehensibly, 51 UCLA L. REV. 1233, 1320 (2004) (discussing the increased length and frequency of amendments to the 1976 Copyright Act).
39. Liu, supra note 37, at 89 (by the 1909 Act, copyright protection extended also to prints, musical compositions, photographs, paintings, drawings, chromolithographs, statues, and works of fine art).
Copyright Act's still containing a list of "[w]orks of authorship" that presumably contain the eligible subject matter of copyright protection, courts have recognized categories such as characters, computer programs, and databases as subject matter capable of copyright protection. This expansion has drawn a wide range of criticism from scholars and has even been dubbed the "second enclosure movement" by commentators.

In addition to subject matter, the temporal property right given to copyrights has expanded from the original term of fourteen years to the present term of 70 years from the author's death or 95 years from creation for works for hire. The breadth of protection has also been expanded, starting with the inclusion of derivative work protection originally included in the Act of 1909 to the various anti-circumvention protections of the recent Digital Millennium Copyright Act. Along the way copyright claimants' rights have been expanded by courts as well as by Congress, in broad doctrinal strikes and by specific changes targeted at very limited situations.

40. 17 U.S.C. § 102(a) lists works of authorship as: (1) literary works; (2) musical works, including any accompanying words; (3) dramatic works, including any accompanying music; (4) pantomimes and choreographic works; (5) pictorial, graphic, and sculptural works; (6) motion pictures and other audiovisual works; (7) sound recordings; and (8) architectural works.

41. See, e.g., COHEN, ET. AL., supra note 28 at 238 (discussing the copyright protection of computer software) and at 294 (discussing copyright protection of databases).

42. See, e.g., Paul Goldstein, Copyright in the New Information Age, 40 CATH. U. L. REV. 829, 833 (1991) (suggesting that "time and experience may prove these extensions [namely protection of computer software and databases] of copyright subject matter to be a bad bargain"); Jessica Litman, Sharing and Stealing, 27 HASTINGS COMM. & ENT. L.J. 1, 18 n.65 (2004) ("There is a rich recent copyright literature analyzing the problems that have accompanied recent expansions in copyright rights.").


44. Act of May 31, 1790, ch. 15, 1 Stat. 124 (repealed 1802).


46. See, Liu, supra note 37, at 96. ("The exclusive rights [under the 1905 Act] similarly expanded to include not only the rights to 'print, reprint, publish, copy, and vend' the copyrighted work, but also the rights to create certain derivative works and publicly perform certain works").

47. 17 U.S.C. §1201

48. The doctrines of contributory and vicarious liability are predominantly judge-made, though generally understood to have been codified by successive enactments by Congress that built on those doctrines. See 18 Am. Jur. 2d Copyright and Literary Property § 219 ("[t]he Copyright Act does not expressly render anyone liable for infringement committed by another, the absence of such express language in the copyright statute does not preclude the imposition of liability for copyright infringements on certain
The scope of copyright has also expanded substantially through the elimination of formalities that used to filter a part of otherwise copyrightable works directly into the public domain.\textsuperscript{50} Finally, the Supreme Court's 1991 decision in \textit{Feist}\textsuperscript{51} enshrined the level of originality required for copyright as "minimal,"\textsuperscript{52} which constitutes a substantial expansion of copyright protection compared to the standards applied a century ago.\textsuperscript{53}

Under the Constitutional mandate for Copyright discussed in the prior section, the expansion of copyright is proper so long as the increase in the property grant creates further net welfare surplus. It would seem uncontroversial that going back to the narrow scope of the 1790 Act would have substantial negative welfare consequences—the general production of films, music, and other forms of entertainment would surely decrease substantially, and those creative efforts that required large initial investments would effectively cease. While never perfect, the U.S. copyright system appears to have functioned well during the past century. What we propose, however, is that in evaluating further proposed changes to the Copyright Act or de facto changes to copyright scope the output effects of the change would be analyzed and considered as part of the discussion. We do that in the following in the context of the Orphan Works Act and conclude that it is consistent with the Constitutional objectives of Copyright.

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\textsuperscript{49} See, e.g., the implementation of 17 U.S.C. §106A (providing specific additional protection for only works of visual art).
\end{flushleft}

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\textsuperscript{50} See, e.g., Christopher Sprigman, Reform[alizing] Copyright, 57 STAN. L. REV. 485, 496 (2004) (discussing various estimates for the percentage of works that were "filtered out" due to the registration requirement before its abolishment).
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\textsuperscript{52} \textit{Id.} at 345 ("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. To be sure, the requisite level of creativity is extremely low; even a slight amount will suffice. The vast majority of works make the grade quite easily, as they possess some creative spark, no matter how crude, humble or obvious it might be") (internal quotations and citations omitted).
\end{flushleft}

\begin{flushleft}
\textsuperscript{53} See COHEN, supra note 28, at 75-85. (discussing the differences of the originality standard under \textit{Feist} compared to the earlier standards of Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53 (1884) and Bleistein v. Donaldson Lithographing Co., 188 U.S. 239 (1903)).
\end{flushleft}
A. The Incentive/Access Paradigm as the Measure of Welfare Maximization

Protecting copyrights leads to societal good because granting authors exclusive rights will induce the creation of more creative works. In the absence of any protection there would be little financial incentive (or sometimes economic ability) for the creative community to invest time and/or money in copyrighted works, and consequently there would be a substantial decline in output, and the promotion of creativity would not be served.54 The creation of copyrightable expression always requires an investment, which can be directly financial (the production cost of a movie) or non-financial (the time an author takes to write a novel). In either case, prior to starting the creative process there is at least an implicit return-on-investment (ROI) calculation that takes place: Is the expected return from the effort sufficient to pay back the investment? The return, of course, can also take other than financial forms, such as social prestige or self-fulfillment. These non-financial motivations are, however, only available when the creator is not forced to consider the investment from a financial well-being perspective.

The investment needed for creating a copyrightable expression can, of course, be diminished by using expression that has already been created. At the extreme, copying someone else’s work in its entirety decreases the copier’s creativity investment to zero. The broader is the scope of copyright, the narrower is the opportunity for subsequent creators to free-ride on previous expression. The problem, however, is that in the broadest conceptual sense all new creation is based on previous work. Would the musical West Side Story have been written if Shakespeare’s Romeo and Juliet had not?55 In copyright this ultimate question of the breadth of copyright is encapsulated in the substantial similarity requirement.56

54. For a more thorough discussion of this basic concept, see, for example, Mark A. Lemley, The Economics of Improvement in Intellectual Property Law, 75 TEX. L. REV. 989, 994 (1997).
55. COHEN, ET AL., supra note 28 at 7.
56. Courts throughout time have struggled with an objective formulation of substantial similarity. These tests, such as the “idea-expression dichotomy” (see Arnstein v. Porter, 154 F.2d 464 (2d Cir. 1946)), “total concept and feel test” (see Roth Greeting Cards v. United Card Co., 429 F.2d 1106 (9th Cir. 1970)), or “ordinary observer test” (see Sid & Marty Krofft Television Productions, Inc. v. McDonald’s Corp., 562 F.2d 1157 (9th Cir. 1977)) have all been criticized as fundamentally subjective, despite striving for objectivity. The difficulty of the determination was highlighted in Judge Learned Hand’s
The societal optimization function comes from the need for copyright to balance the two contravening forces: The increase of copyright protection’s incentive benefit from its inducing effect on new creation, and the output-limiting effect that excessive protection of copyrights would impose on society, including adverse effects on new creation. As an example of this last point, if typical plotlines were eligible for copyright, output would be impacted negatively because film makers would be limited in their ability to use these customary formats.

By specifying the societal benefit and cost functions it is possible (in principle) to find the point at which the difference between the aggregate incentive benefit and the aggregate access cost is maximized. At any level of protection less than this point or beyond this point the overall welfare to society is no longer maximized. This phenomenon is commonly referred to as the “incentive-access tradeoff” and forms the bedrock of the model presented in Part IV.

early decision in *Nichols v. Universal Pictures Corp.*, 45 F2d 119 (2d Cir. 1930), where he noted that he founded his decision on the conclusion that “the defendant took no more—assuming that he took anything—than the law allowed.” The more appropriate question would seem to be how much does the law allow.

57. The paradigm is generally attributed to Kenneth Arrow’s article *Economic Welfare and the Allocation of Resources for Invention* in THE RATE AND DIRECTION OF INVENTIVE ACTIVITY 609, 617 (Universities – National Bureau Committee for Economic Research 1962). See, e.g., Glynn S. Lunney, Jr., *Reexamining Copyright’s Incentives-Access Paradigm*, 49 Vand. L. Rev. 483, 485 n. 5 (1996). Prof. Lunney’s article presents a major criticism of the paradigm arguing that “[d]espite its enduring and widespread popularity, however, the incentives-access paradigm is fundamentally flawed.” *Id*, at 486. He argues that, the inherent paradox in the paradigm’s attempt to at the same time protect incentives and access “leads inevitably to a copyright system that provides the most protection for those works that society least needs, and the least protection for those works society most needs.” *Id*. at 487. The article also contends that “[f]rom an allocative-efficiency perspective, copyright provides the proper degree of protection when it ensures that individuals will produce works of authorship if, and only if, such production would represent the most highly valued use of their resources.” *Id*, at 489. Both arguments, however, introduce a qualitative element into the discussion not suitable for economic analysis. How, other than subjectively, do we decide what works society needs most? How is it possible, *ex ante*, to know whether an aspiring writer’s resource investment induced by copyright is an efficient allocation or not? Maybe he ends up writing a novel of “no value,” but if, *ex post*, the fruit of his creation is the next “Da Vinci Code”, then the answer is quite likely “yes.” The difficulty with Prof. Lunney’s approach is highlighted in his criticism that “copyright ensures individuals a higher price for their resources when invested in an entertaining work than they would receive for investing in a useful work ..., even when the useful work ... is of greater value to society.” *Id*, at 492. Who determines what works are “entertaining” or “useful,” or their respective “value to society”? Because this article is supposed to be “useful,” whereas Da Vinci Code was primarily “entertaining,” does it then follow that our article is of “more value to society”? We respectfully decline any invitation to consider such comparisons.
The academic literature analyzing the optimal extent of intellectual property protection comes primarily from economists and is focused primarily on patent protection. The most authoritative law and economics discussion of copyright protection is that of William Landes and Richard Posner in their 2003 book, which presents a formal economic model for copyright. Before presenting a brief survey of some of the other economics literature, we start with a discussion and critique of some aspects of the Lander and Posner presentation.

B. Summary of the Landes and Posner Model

One of the key insights of the Landes and Posner ("L&P") model for this article is its affirmation of the incentive/access tradeoff—i.e., recognition that the net societal surplus from the copyright regime varies as a function of the level of copyright protection. The authors posit an index "z" to connote the level of protection, which includes both the length and the breadth of the regulatory property grant, how similar the two works must be to trigger infringements, the broadness of exceptions to exclusive rights (e.g., fair use), the elements of the work that are protected, and the efficacy and cost of enforcement.

Based on various assumptions, some of which are discussed below, the authors conclude that at low levels of z the revenue enhancing effect of limiting free-riding will dominate, and an increase in protection will create net societal surplus from creative output; but at a certain level of z access costs will begin to dominate, and the regime no longer maximizes societal welfare through the inducement of new output. The authors ascribe the value "z*" to the level of protection that maximizes societal welfare from the copyright regime.

1. The Property Nature of z

Landes and Posner term the variable z as the "level of protection." The variable could, however, more accurately be described as the level of statutory propertization of copyright claims. Copyright, as is the case for any intellectual property, is a statutory creature that exists only through polity grant. In other words, due to the lack of possessory titles and an inherent inability to exclude, the property characteristics of copyrights are to a much larger degree

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58. See Landes/Posner, supra note 7.
59. Id. at 71 (“We denote the level of copyright protection by z ≥ 0, so that z = 0 denotes no copyright protection and z = 1 signifies complete protection”).
than physical property dependent on the regulatory framework that entitles the claimant to use the relevant polity's enforcement powers to protect the entitlement. The higher the protection is, the more in rem rights the claimants accumulate—most importantly the power to exclude—and the more propertized the copyright claim becomes.

Understanding $z$ as the level of statutory propertization means that a value of $z = 0$ would represent no property rights—i.e., open access where anyone can use the claimed subject matter freely. As $z$ increases, the exclusionary rights of the claimant become stronger, and $z = 1$ would represent a theoretical point where the claimant could exercise "absolute" control over the copyrighted matter. At $z = 1$ copyright protection would be infinite in length, there would be no affirmative defenses for use (e.g., fair use, First Amendment, de minimis, etc.), no similarity would be allowed, enforcement would be perfect and immediate, and so on. It is clear that $z = 1$, or anything close to that, would be impossible ever to attain.

The variable $z$ is central in the alternative model presented in the next Part because this is the very factor that the legal system can address. The extent to which property rights are granted to copyrights is entirely a matter of policy. Once it is agreed that the United States Constitution requires $z$ to be set to maximize the net societal value of the copyright regime through output and dissemination of creative works, defining rights becomes a matter of economic modeling based on empirical data to set the variable at the socially optimal level.

2. Recognizing the Multiplicity of $z$ for Different Dimensions of Regulation

Although in a simplified model a single aggregate point $z^*$ can be derived by adding the weighted individual factors of the various dimensions of $z$, it is important to recognize the separateness of each individual attribute of $z$. Fundamentally these dimensions relate to a temporal aspect (length) of the property grant as well as its broadness—i.e., factors such as boundary issues (e.g., fair use, First Amendment limitations), toleration of similarity, ease of enforcement, and so on. An important third dimension of the analysis is the cost and efficacy of enforcement. Because legal rights

60. The distinction between open access and a commons is worth noting here. Whereas the commons is exhaustible, copyrights are not. The users' behavior will therefore be different, because unlike in a commons where overgrazing will exhaust the field, copyrighted matter is "eternal."

61. Takalo employs the variables $T$ and $w$ to connote the length and breadth of protection, respectively. See Tuomas Takalo, On the Optimal Patent Policy, 14 FINNISH ECON. PAPERS 33 (2001).
that are costly or otherwise difficult to enforce constitute de facto a lesser level of propertization than rights where relief can be obtained at a low cost and in a timely manner. Thus, \( z \) is best thought of as vector:

\[
z = \begin{pmatrix} z_1 \\ z_2 \\ z_3 \\ \vdots \\ z_n \end{pmatrix}
\]

where \( z_1 \) to \( z_n \) represent the various dimensions of the overall property grant, such as length, the various factors making up breadth, and the efficacy of enforcement.

It is entirely possible that in a given regime the length of the protection exceeds its optimal value, but that at the same time the breadth of protection (e.g., fair use) is too low. Each dimension of the regulatory scheme has its “own” \( z^* \), and the theoretically optimal outcome would result only from setting each \( z^* \) to its individual point of optimality:

\[
z^* = \left( h_1 z^*_1 + h_2 z^*_2 + h_3 z^*_3 + h_4 z^*_4 + \ldots + h_n z^*_n \right) / n
\]

where the corresponding factor \( h \) indicates the relative weight of each of these dimensions. The matter is further complicated by the fact that \( z^* \) is different for each potential copyright claimant. But this mathematical exercise can be overcome by recognizing that a hypothetical “average” creator represents the outcome from a model that aggregates all of the \( z^* \)'s of potential creators.

C. Critique of the Landes and Posner Model

As is true of any economic model the L&P model employs various assumptions that are necessary for the arithmetic calculations used to solve the various economic equations. The following paragraphs will critique two specific aspects of the model: the assumption that the creative author’s marginal cost of copies is constant whereas the users’ marginal costs of copies are escalating.

62. Or to put it differently, for the incentive to remain constant “if breadth is reduced the optimal life must increase to compensate.” Id. at 36; William D. Nordhaus, The Optimal Life of the Patent: Reply, 62 AMER. ECON. REV. 428, 430 [hereinafter Nordhaus II].
and the broader rationale of tying the analysis to the number of copies.

1. Assumptions About the Marginal Cost of Copies

The L&P model solves the various functions by analyzing the supply of copies by the author and by others, and by deriving various points of equilibrium through different forms of marginal cost analysis. The costs for the author \((A)\) consist of the fixed cost of expression, \(e\), and the variable cost of reproduction, \(c\), with \(A\)'s marginal cost of copies \((c_A)\) assumed as constant, whereas for the users \((U)\) marginal costs \((c_U)\) are presumed to be escalating.

L&P openly admit that this assumption is necessary to make their model work, but argue that it is also realistic.\(^6\) L&P's argument is that at a given level of \(z < 1\) there will be copying by consumers and other users that will be more costly and that, therefore, such disparities "should generate differences in the cost of copying among copiers" and consequently lead to increasing marginal costs.\(^3\)

Fully understanding the need for L&P to incorporate this assumption into their model to make it work, we nevertheless question whether it is sufficiently realistic. The assumption is based on an assertion that at any given level of \(z < 1\) there will be "types of copying that will be more costly," and from this L&P leap to the conclusion that the copiers' marginal costs would be escalating. However, it would seem that the escalating costs to the copier from an increase in \(z\) would affect the fixed cost of expression, \(e_U\), not necessarily the copiers' marginal cost of a unit, \(c_U\). So, while there will be a difference in the cost to \(U\) at various levels of \(z\), it does not follow that the cost-enhancing effect of \(z\) on \(U\) manifests itself though increasing the marginal cost \((c_U)\). A more accurate conclusion may be

\(70.\) Landes/Posner, supra note 7, at 72.

\(64.\) Id. In order to avoid any possible misrepresentation, we reproduce the full passage (p. 72), which reads as follows: "More important, it is realistic to assume that copiers will have increasing marginal costs. Recall the copying that takes place at a given level of \(z\) is lawful. Some of it takes place by consumers (for example home taping of television programs) and some by producers who incorporate the author's work into their product (for example, fair use copying). The higher \(z\) is the less the amount of such lawful copying. At a given level of \(z < 1\), however, there will be some types of copying that require consumers and producers to use only a small amount of their own resources. They will be able to free ride on the author's work, so the cost of copying will tend to be low. Other types of copying will be more costly, and here free riding will be less important. Such differences should generate differences in the cost of copying amongst copiers and so lead to rising marginal costs for the copiers as a group (rising because if demand falls, more of it will be supplied by the copiers having the lowest marginal costs)." Id. (emphasis in original).
that instead the economic impact of \( z \) should be viewed as creating a
difference in the fixed costs of expression between \( A \) and \( U \).

To illustrate the argument, let us assume that the marginal costs
of \( A \) and \( U \) are both constant, and moreover that they are equal. At
the extreme, at \( z = 0 \), the fixed cost of \( e \) to \( U \) would be zero because
there is no copyright protection and all expression is freely usable.
And with the marginal costs being constant and equal between \( A \) and
\( U \) there would be little opportunity for \( A \) to capture his initial fixed
creative investment \( e_A \). This demonstrates the obvious point that in
the absence of any copyright protection, investment in copyrightable
materials would not be justified on economic grounds. There could, of
course, still be creative expression that is motivated by other
incentives. 65

As \( z \) increases, \( U \) will need to incorporate increasing amounts of
his own original expression into the work to prevent \( A \) from being
able to exercise his property rights under the copyright regime, 66
which pushes the fixed creative cost \( e_u \) upward. It is important to
note, however, that \( e_u \) can just as well be an investment in a new
expression that renders a license from \( A \) unnecessary. Or it could be
an investment that \( U \) makes to acquire rights to the expression from
\( A \). Even if \( U \) acquires the totality of the expression from \( A \), if his
variable costs are less than \( A \)'s, then both can benefit by a license
from \( A \) to \( U \). In fact, for example, the book publishing industry is
based on the premise that the variable costs of \( U \) (the publisher) are
lower than those of \( A \) (the author), which results in the motivation of
authors to license their works to publishers.

These examples are intended to demonstrate that the general
assumption that copyright users' marginal costs are higher than the
author's marginal costs is not quite as realistic as Landes and Posner
argue. The difficulty of this to the L&P model is that its mathematical
computations do not work unless their argument of higher marginal
costs for users is accepted.

2. The Relevance of the Number of Copies

The L&P model is based on a notion that a "copy" is the driving
variable in copyright economics. It is certainly correct that publishers
continue to count the number of copies of books sold and record
companies count the copies of CDs sold and even the number of paid

65. See discussion about the existence of \( a \) in IV.A., infra. The variable \( a \) refers to
the baseline creative output that would take place even in the absence of any copyright.
66. 17 U.S.C. § 502 (permitting courts to grant injunctions to "prevent or restrain
infringement of a copyright").
digital downloads. However, with increasing amounts of copyrighted content becoming disseminated through various subscription models\(^67\) over the Internet, the copy as an economic unit loses some of its significance.

Measuring the societal benefit and cost of copyright protection through the number of copies produced and sold is specifically questionable when the marginal cost of a "copy" is in many digital contexts approaching zero. In this environment the more appropriate economic index is the aggregate societal value\(^68\) derivable from the copyright and how the total value of a copyright should be shared between authors, publishers, users, and society in the most efficient manner.

The difficulty in attempting to pinpoint \(z^*\) when applying the L&P model's copy-centric view is highlighted when a copyrighted work is adapted into a different medium. The movie "The Da Vinci Code" is a licensed derivative work of the book by Dan Brown of the same name. However, comparing the copies of the movie made from a novel to copies of the original novel would not appear to be a sensible exercise. In fact, counting "copies" of a film does not appear to be a proper measure of the economic value of the work in any instance, because the correlation between the number of prints of a film and its economic output contribution to society is hazy at best. And with the advent of digital distribution of practically all media the fixation to measure the economic variables of copyright using the concept of a "copy" will continue to decline in its meaningfulness.

D. Other Economic Models for Intellectual Property

The academic analysis of intellectual property law has been primarily focused on patent scope,\(^69\) and specifically patent length. A founding discussion between Professors F.M. Scherer and William D. Nordhaus over the model for an economically optimal patent regime

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67. See, for example, the Napster To Go music subscription service where "For only $14.95 a month, you can fill and refill your compatible MP3 player with your favorite music, artists you've just discovered and the latest releases without paying 99¢ per track. Get everything Napster has to offer PLUS unlimited music for your Napster To Go-compatible MP3 player." [http://www.napster.com/ntg.html](http://www.napster.com/ntg.html).

68. In light of our criticism in note 64, supra, of Prof. Lunney's use of "societal value" in a way that injects a subjective notion of certain types of works' being more important (and thereby more "valuable") to society, we measure societal value simply by the aggregate monetary amount that the copyright is capable of extracting from a free marketplace.

69. Interestingly, the patent literature leaps over the conceptual discussion of the objective of the regime and implicitly accepts a utilitarian frame of mind.
ensued a quarter century ago. Scherer observes from an economist's viewpoint the fundamental positive law school legal premise by noting that to the polity "patent life is a policy variable." The economic discussion focuses on the specifics of the incentive benefit with the conclusion that "easy inventions—those yielding big cost savings in relation to the research resources invested—warrant shorter patent protection than hard inventions." Despite the economics merits of Professor Scherer's suggestion, the notion that intellectual property grants would be tied to the investment made would leave courts with an impossible task of adjudicating the fair value of non-monetary investment.

In his response to Scherer, Professor Nordhaus reaches three conclusions: (1) a fixed property grant term is not optimal in theory; (2) the inducement of "drastic inventions" requires a longer patent grant; and (3) compulsory licensing would lower the level of investment in inventions. The first and second observations essentially correspond with Scherer's argument, and suffer from the same flaws. The third statement recapitulates the premise of the incentive benefit function—i.e., that there is a positive correlation between the property grant and the level of investment. A compulsory licensing regime is essentially a limitation on the property grant, and similarly as any reduction in the property grant will suppress incentives to invest so would compulsory licensing.

Another exchange of commentary took place in 1990 between Professor Paul Klemperer and Professors Richard Gilbert and Carl

71. Scherer, supra note 70, at 423. Presumably, for a natural theorist the decision would not be a policy decision due to the "inherent" rights entitlement that the creator possesses irrespective of polity grant.
72. Id. at 426.
73. For example, would a novelist who took a year to write a book be entitled to more protection than the novelist who wrote a comparable book in six months because the time investment by the prior was greater?
74. Nordhaus II, supra note 70, at 430-431.
75. In this respect it is worth noting the increasing impact of compulsory licenses, such as section 114 of the Copyright Act, which creates a statutory license for certain uses of sound recordings. If as part of the digital evolution the channels of exploitation governed under sections 114 would come to represent a significant segment of the industry, this could predictably have an output-curtiling effect for sound recording production because compulsory rates may be below market-determined levels.
Klemperer's article demonstrates economic conditions where a short but broad patent grant would generate more societal surplus, and compares them with situations where the opposite is the case; Gilbert and Shapiro observe that the optimization of social welfare depends on a policy decision with respect to two variables: length and breadth. The article presents an economic justification that a combination of longer patent term with a compulsory licensing scheme would result in socially optimal results.

An interesting European contribution to the discussion is Tuomas Takalo's 2001 article, which recapitulates the foundation economics study of the subject matter and attempts to synthesize the various models presented. Takalo focuses the policy issue on the public good aspect of intellectual property—i.e., its inherent characteristics of being inexhaustible and non-excludable. After observing that the economic modeling of intellectual property rights has been "convoluted and characterized by subtle points of inconclusive controversy," Takalo presents as his conclusion that if the length of protection has a large impact on the incentive to innovate then the property grant should be of minimum breadth and maximum length. If the converse is true, then the property grant should have maximum breadth and minimum length.

In proving his proposition Takalo focuses on the interplay between the private and social returns on innovation, and formulates his proposition from scenarios where the private return function with
respect to either the length or breadth of protection is convex versus situations where the function is concave. Takalo does not, however, differentiate between the impact of changes to the property grant with respect to private return and level of investment. While an increasing property grant may well be a convex function with respect to private return—due to the increasing opportunities for strategic behavior\textsuperscript{81}—this does not translate to the incentive to invest being convex, and in fact as discussed in Section A of the next Part, \textit{infra}, we argue that the incentive to invest function is always concave.

A leading exposition on the economics of patent grants from the legal community's side is Professors Robert P. Merges and Richard R. Nelson's 1990 article "On the Complex Economics of Patent Scope".\textsuperscript{82} The authors' conclusions include pointing out the inefficiencies of the "race to invent" model and the blocking effects of broad patents. Merges and Nelson also note that variable patent grants tied to the investment and nature of the invention would result in societal efficiencies.

As a result of the independent creation doctrine, the "race to invent" problem is not a consideration in copyright law. The blocking effect of patents as well as copyrights is a fundamental aspect of the offsetting access-cost to the incentive-benefit discussed in the following model. A system of variable intellectual property grants would undoubtedly be economically optimal, but as a practical matter the cost of administrating such a system would likely make it inferior. More importantly, the ex ante uncertainty as to the property grant would likely result in the incentive-benefit of the regime being substantially undercut. In any event, on a pragmatic level variable copyright grants are not a realistic policy objective and are therefore ignored in the following discussion.

A major recent exposition on the economics of intellectual property was presented by Professor Suzanne Scotchmer in her 2004

\textsuperscript{81} For example, let us assume that the substantial similarity requirement for infringement (a sub-variable of copyright breadth) is decreased—i.e., that less similar works would be considered infringing. For a copyright owner of a tragic story involving two lovers from rival families the increased breadth of expanding their ability to claim any depiction of a tragic story involving two such lovers to be infringing would give the company a substantial private benefit. If the breadth would be expanded further to bring in any love story within the sphere of the copyright owner's proprietary rights, the private benefit would be exponentially greater, suggesting a convex slope. This, however, is entirely different from the function of what property grant was needed to induce the original creation of the story.

book Innovation and Incentives. The book independently reaffirms an L&P-like conception of the existence of $z^*$ by referencing Nordhaus and noting that an increase in the property grant “may not be beneficial from a societal point of view.” The book also acknowledges that a very high $z$ on certain aspects of copyright breadth would result in the “transaction costs of licensing copyrighted works for incidental use to be prohibitive,” implicitly acknowledging the economic necessity of the fair use doctrine of copyright.

Despite being at the highest academic standards for economic writing, these articles and models have one thing in common: They do not present a cohesive framework sufficiently simple for the legal community or the legislature to use as a practical analytical tool for the evaluation of policy decisions. In the following we attempt to remedy this, and present an economic model that captures the essence of the incentive/access paradigm in a way that can be used by legislators and practitioners to evaluate the social welfare impact of changes to copyright law.

IV. A Model for Copyright to Maximize Societal Welfare

The following presents an economic modeling of the incentive/access tradeoff that corresponds to the output and societal welfare-maximizing objective of the Constitutional utilitarian mandate of the Copyright Clause. Since Landes and Posner did not present such an approach in their book and a survey of other materials did not reveal such a model having been set forth, what

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84. Id. at 99 (citing Nordhaus I).
85. Id. at 115.
86. As a post-script to the positive law/natural law discussion, supra, it should be noted that natural law could not form a basis for the economic analysis of copyright. Economically each author would generally prefer the broadest possible copyright scope; i.e., $z = 1$. Since this is not possible as a practical matter, the policy decision as to how much to limit the copyright grant under a natural law approach would have to be done on other grounds—primarily subjective moral determinations—because economically any curtailment would be against the pure economic interest of the primary stakeholder, the author. This would first appear to suggest that the broadest possible copyright would be in the entertainment industry’s best interest. However, entertainment companies cannot, per se, be authors because it is exclusively a human activity. The entertainment industry acquires copyrights in different ways. Under a pure natural law interpretation it is the creative staff—the “laborers” as Locke would put it—at the entertainment conglomerates whose rights would be emphasized.
87. The underlying notion of Nordhaus II, supra note 69, and Takalo, supra note 68, of pitting protection length against breadth is relevant but not analogous to the proposal presented here. Of course, the importance of breadth versus length may vary from
follows is an initial economic framework to outline the principles of the incentive/access paradigm, and pinpoint the societally optimal point \( z^* \).

**A. Benefit to Society from Protection of Copyright**

The simple conceptual premise of the incentive benefit is that the more that copyrights are propertized—i.e., the higher as a policy decision \( z \) is set—the more opportunity the copyright claimant has to recover his investment and earn a return on it, and, consequently, the more incentive there is to invest resources in the production of copyrightable works. This investment is (in the following) termed the incentive-benefit of copyright protection, or \( I \). As the legal system increases \( z \), the incentive for authors to invest to produce copyrightable works grows, and society can expect more creative output. Therefore, the starting premise is that \( I \) is a positive function of \( z \):

\[
I = f(z) \\
\frac{dI}{dz} = f'(z) > 0.
\]

The societal incentive can be aggregated from the individual incentive curves of individual actors. Consequently, setting aside the situation to situation, but this will merely result in a change in the slope of the incentive function. Both length and breadth are independently subject to the functions presented in this Section.

88. The investment can be either financial or that of intellectual labor or genius. Although the United States copyright regime does not reward the “sweat of the brow” (Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340 (1991)), it is safe to note that, for example, writing a novel requires labor and not just creativity.

89. This is consistent with the Demsetzian brand of utilitarian property theory—i.e., increased propertization results in more investment. See, Harold Demsetz, Toward a Theory of Property Rights, 57 AM. ECON. REV. 347 (1967). For examples of the broad academic literature generated by Demsetz’s article, see, e.g., Katrina Wyman, From Fur to Fish: Reconsidering the Evolution of Private Property, 80 N.Y.U. L. REV. 117 (2005), n.1.

90. Landes and Posner term this the “revenue-enhancing effect,” as opposed to the “cost-enhancing effect” of the related externalities.

91. As is clear in the text below, we posit a link between the author’s investment \( I \) and expected creative output and between that output and societal benefits. Nadel, n.9, supra, challenges the fundamental premise that increasing \( z \) will increase creative output and argues that increased propertization leads to a winner-take-all environment where investment in marketing will, in fact, create a barrier to entry for economically marginal creators. Marketing, however, relates to a business effort by the proprietor to develop the underlying copyrighted work into a brand—i.e., a trademark. This is conceptually no different from a pharmaceutical company’s marketing a new drug, where the company is taking a patent and turning that into a trademark. The societal objectives of trademarks are entirely different from those of copyright, including issues such as the reduction of search costs for consumers, and providing an incentive for the trademark owners to maintain the quality of their products. Since this article focuses exclusively on copyright production, we leave these considerations aside.
complex modeling that this would entail, the correct end result can be reached by simply considering the societal incentive curve to be identical to that of the common legal fiction of the "average" creator.

An important feature of \( I \) is, however, that there is a base level of investment that is made even at the point \( z = 0 \). This factor, labeled \( \alpha \), represents the amount of creative investment that would be made even in the absence of any copyright propertization.\(^9\) Of course, such investment may not be (strictly) economically justified (i.e., authors could create as part of recreation rather than as a profit-driven effort, or they could be "driven" to create), but as an empirical fact it does not seem controversial that certain creative output would occur for other reasons than potential for economic reward.

The other key feature of the incentive benefit is that as \( z \) grows the marginal increase of \( I \) diminishes; i.e.,

\[
\frac{d^2I}{dz^2} = f''(z) < 0.
\]

This phenomenon is easily understood conceptually by first considering \( z \) in the context of real property. Let us assume that the Nevada desert is infinite, that it has some oil deposits, and that it is all state-owned property. The state wants to induce exploration by increasing the incentives to potential oil drillers. In order to reduce free-riding by subsequent drillers on found oil deposits, it establishes a program whereby anyone willing to drill a hole will get a property grant of an acre around the drilling place. This program results in some drilling, but the state feels that society would benefit if there would be more exploration (and therefore more output of oil), so the property grant is increased to two acres. The exploration increases because oil explorers have less of a concern that if they do hit oil someone would drill so close as to drain the same oil pool.

The state, however, feels that still more exploration would be beneficial, so it continues to increase the size of the property grant. In doing so the incentives to explore continue to rise, but the

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9. On the existence of \( \alpha > 0 \), see Landes and Posner at 22 ("We know this because an enormous quantity (and quality) was produced before [copyright existed] and even today a great deal...would be produced if [copyright] did not exist."); David Nimmer, Copyright in the Dead Sea Scrolls: Authorship and Originality, 38 HOUS. L. REV. 1, 135 (2001) (discussing incentives to create and noting that within academia "the impetus...lies in other domains—university posts, research grants, scholarships founded on the commonweal, fame, recognition, and attribution"). Also, there may be other means, besides copyright protection, whereby the author can gain economic benefits. Direct contractual arrangements between the author and users may be one means; another may arise in the case of physical works of art, where the creator may be able to benefit from selling the authenticated "original." Also, in another realm of intellectual property—patents—trade secrets are an alternative means of gaining benefits for the creator.
incremental increase in exploration from the larger grant will be diminishing. This is because potential explorers will likely believe that the difference between a two-acre grant and a one-acre grant is much more significant than the difference between an eleven-acre grant and a ten-acre grant. Doubling the initially small property grant serves to eliminate a much greater competitive threat to the explorer compared to the same absolute increase in the property grant amounting only to a 10% expansion from the previous state.

Now substitute for the desert the infinite space of creative expression, and for the oil explorer the creator of a work of authorship. Similar to the oil explorer, the same absolute increase in property protection induces investment in creation more when \( z \) is low compared to a situation where the creator already has a substantial property grant. This is not to say that the private value to the claimant would not always increase linearly, or even exponentially.\(^9\) If weak copyright is strengthened, the increase in \( z \) will foreclose direct competition and preserve the claimant’s property where it is most valuable—“near” the drilling hole. An increase of \( z \) of the same amount when protection is already broad will not incentivize the author as much, because in such a situation the property expansion is likely in markets that the claimant does not consider in evaluating the investment to create.

The phenomenon can also be looked at from the viewpoint of regulation. Let us assume that the City of New York sells exclusive business licenses for specific geographic areas to restaurant entrepreneurs. The license is, however, limited to only allowing the establishment of one restaurant. In such a situation, a bigger geographic area of exclusivity would induce more potential restaurant entrepreneurs to apply for the license and pay the fee. However, a one-block increase that doubles the grant will induce more new restaurant license applications than would an increase of one block if the original area is already ten blocks. This is because the difference in whether a competing restaurant is eleven or twelve blocks away matters much less compared to whether it is one block away or two blocks away. As the competing restaurant is pushed farther away, there is less direct competition anyway, so the increase in the

\(^9\) In fact, as copyrights broaden, the exclusionary rights of the claimant may enable it to engage in more strategic behavior and enable it to extract increased returns. This, however, is entirely separate from the determination of the threshold propertization needed for the claimant to engage in the activity. Of course, the oil driller would prefer that the entire Nevada desert be awarded to him for drilling one hole, but what is relevant here is only how much is necessary to induce him to make the investment.
property grant represents less of an incentive for the contemplating entrepreneur.

The preceding discussion of the incentive benefit of copyright propertization implies that the relationship between creative investments and the extent of propertization is a concave function. One specific characterization of this functional relationship would be:

\[ I = \alpha + \log(z) \]

where \( \alpha \) represents the base level amount of creative investment that would exist absent any copyright protection and the logarithmic function indicates the additional output that increased copyright propertization induces. The graphical illustration of the incentive benefit is portrayed in Figure 1:
The diminishing marginal increase in the incentive as $z$ increases applies to both the breadth and the length of copyright protection. With respect to copyright length the obvious conclusion is that a one-year increase when the term is short is a more powerful incentive than when the term is already long. This is partly due to psychological factors: it is much easier for a creator to comprehend an improvement in the low end than when protection already is substantial. From an economic standpoint the lesser value of an extension farther out is due to discounting and also to the increased risk that the work of authorship has by then been commercially exhausted.

If we relate this back to the oil drilling example, if the grants by the state would be temporally limited, then a one-year increase from 100 to 101 years would induce less incremental drilling than an increase from 10 to 11 years. In addition to discounting, this is also because it is less likely that even if oil is found the pool would still generate value after a hundred years than it is that the pool would do so after ten years.

The analysis above focused on the *ex ante* incentives of private investment, but it can be transposed directly to depict the societal benefit side of copyright propertization through the following steps:
1. Increase in the property grant induces incremental creation;
2. Incremental creation results in more output;
3. Creative output has societal value;
4. Therefore, the increase in the societal value is a function of the increase in output, which in turn is a function of private incentives to creative investment.

This allows the investment ($I$) in works of authorship to be linked with an average societal value ($v$), and the societal welfare ($W$) created by the copyright system can thereby be calculated as the perpetually discounted product of the two, or:

$$W = \frac{(I \cdot v)}{r}$$

where $r$ represents the discount rate.

B. Cost to Society from Protection of Copyright

The societal cost of the protection is the limit that it puts on the copying of already created works and on the creation of new output, because potential authors and investors in creativity are disincentivized by a concern that, e.g., their work would be considered infringing due to a too close similarity to a previous work. As $z$ increases the “space” left for new creation diminishes, which in turn creates a social cost through its output limiting effects discussed above. In applying the incentive/access tradeoff terminology, this is labeled the access-cost, or $C$, of copyright protection.

What makes $C$ somewhat more complex than $I$ is that it is the sum of two independent factors: (1) the costs that would exist in a frictionless society—i.e., the Coasean\(^4\) utopia of no transaction costs ($C_q$), and (2) costs related to market imperfections ($C_m$). The Coasean (frictionless society) cost arises from the ability to price above marginal costs\(^5\)—a phenomenon necessary for the claimant to recoup

\(^4\) See Ronald Coase, The Problem of Social Cost, 3 J.L. & ECON. 1 (1960). The “Coase Theorem” is commonly used to describe a society where transaction costs are zero, and in which therefore under Prof. Coase’s framework the allocation of resources is most efficiently done bilaterally by the societal actors.

\(^5\) We have refrained from describing copyright in terms of “monopoly,” because the latter term seems inappropriate to describe a system in which hundreds of thousands of new pieces of property are created every year. Instead, like real estate, every piece of copyright property is unique and different from each other. They compete to greater or lesser extents (imperfectly) with each other. The models of “monopolistic competition” and “imperfect competition,” developed by Edward Chamberlin and Joan Robinson, respectively, seem more appropriate. See EDWARD H. CHAMBERLIN, THE THEORY OF MONOPOLISTIC COMPETITION, (7th ed. 1960); and JOAN ROBINSON, THE ECONOMICS OF IMPERFECT COMPETITION (2d ed. 1969).
the initial fixed investment in the copyrighted content. The market-
imperfection-related costs include primarily transaction costs, search
costs, and the cost of enforcement.9

1. Frictionless Society Costs of Copyright

The societal cost of copyright in a frictionless society can also be
demonstrated using the oil exploration and restaurant examples of
the previous section. As the property grants for oil explorers are
increased, the increase in the incentive to drill is offset by the inability
of others to drill in areas that are now demarcated by prior explorers.
As the size of the property grants increases, the disincentive for
drilling by newcomers escalates as they will be pushed progressively
farther away from areas where oil has been found. This may enable
the property claimant to “rest on its laurels” or extract monopoly
rents for drilling rights from second-comers that will reduce drilling,
and thereby reduce output and increase the price of oil to consumers.

Similarly, in the restaurant example, a very large exclusive area
would have a social cost simply as a result of there being fewer
restaurants. There would be less competition (i.e., higher prices) as
well as longer distances for consumers to travel to get to one.

In the copyright context the Coasean costs can best be
understood in the context of a specific dimension of \( z \), such as the
requirement of similarity. If \( z \) is increased—i.e. the requirement for
similarity is lessened—output would be curtailed because, e.g., film
studios would have more exposure against claims that their
production is “similar” (although not “substantially similar”) with
something previously created. In the same vein, if \( z \) would be
increased so that a single word would constitute copyrighted
expression, future output would be nearly impossible because authors
would be impaired in their ability to create with a substantial part of
the terrain from which to draw for their creation being already
“staked out.”

The Coasean costs increase as \( z \) increases because this will bring
increasing numbers of works within the proprietary scope of their
original claimants, and allow the type of strategic behavior discussed
above.

Unlike the incentive benefit, however, the shape of the
relationship between Coasean costs and \( z \) is difficult to specify \textit{a
priori}. On the one hand, extending the copyright term generally has a

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96. Landes and Posner do not draw a distinction between frictionless and market
declining marginal cost aspect: The present value of the costs of users’ waiting an extra year when the copyright term is being extended from 75 to 76 years is smaller than when the term is being extended from 3 years to 4 years; this would imply the same concavity that applies to the incentive benefit. With respect to the breadth of propertization, an increase in z could imply either falling or rising marginal social costs. The mathematical depiction of the Coasean cost is therefore

\[ C_q = g(z) \]

\[ \frac{dC_q}{dz} > 0 \]

\[ \frac{d^2C_q}{dz^2} > 0 \text{ or } < 0 \]

where the g costs represent the societal value of the access loss imposed by the property regime.

2. Market Imperfection Related Costs of Copyright

The non-Coasean costs with respect to copyright are much greater for copyrights than they would be for oil exploration or restaurant licenses. This is because of the cumulative nature of copyrights, also referred to as the OTSOG principle. Unlike oil drilling, where each new hole is started from inception, works of authorship are by their nature connected to a social context and draw on ideas and concepts from works before them. Although copyright law enshrines the “idea/expression dichotomy,” a bright line between the two is not conceptually possible. Rather, a higher level of z connotes that more abstract concepts would be copyrightable. At the extreme, the storyline (and not the specific expressive elements) of West Side Story might become infringing of Shakespeare’s work (assuming perpetual copyright). The limitation on the authors and producers of West Side Story to proceed without a license from the Shakespeare estate would have created a societal loss different in kind from the oil drilling or restaurant license examples.

A broad copyright grant also enables copyright claimants to engage in strategic behavior—e.g., by leveraging the copyright to accomplish anti-competitive ends. An example of such opportunistic

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97. Lemley, supra note 54, at 997 n.30 (“The most famous formulation of this phenomenon is credited to Sir Isaac Newton, who reportedly said, “If I have seen further it is by standing on the shoulders of giants.” THE OXFORD DICTIONARY OF QUOTATIONS 362 (3d ed. 1979). This is occasionally referred to in computer law as the OTSOG (“On the Shoulders of Giants”) principle”). Again, in a Coasean world the parties would be able to bargain to a mutually advantageous agreement that would allow the subsequent creator to build upon the earlier work (so long as greater social value is created in the process).

98. Although subsequent drillers may be able to learn from earlier drillers—e.g., about successful (or unsuccessful) technologies, geological conditions, etc.

99.
behavior was seen in Ringgold v. Black Entertainment Television, 126 F.3d 70 (2d Cir. 1997), where the plaintiff asserted a violation of her display right when an authorized poster depicting her work was used in the background of a scene for a television program.

The other market-imperfection-related costs arise from inherently unique characteristics of copyrights, most importantly their fuzzy metes and bounds. Unlike tangible property, which can be demarcated precisely, the perimeters of a copyright grant are always abstract. The broader the grant, the more situations there will be where the limits of the property right may have been crossed. This will drive up both transaction and enforcement costs.

The market-friction-related costs (i.e., transaction, search, and enforcement costs) are not linear but rather are likely to form a convex function. The reason for this can be more easily illustrated with a limitation on *de minimis* use: the smaller is the allowance (i.e., the higher $z$ is), the lower the trigger for a secondary creator to need to find and obtain a license from every prior copyright claimant whose work could be in any way incorporated into the secondary creation. This will result in an escalating number of small licenses where the search and transaction costs would make the secondary output impossible. While in a frictionless society this additional licensing will not impose more than linearly increasing societal cost, the need for a copyright user to search and transact with increasing numbers of parties who may claim an interest in the secondary work due to a prior copyright will result in exponentially growing transaction and search costs.

The same logic can be applied to a fair use analysis. As fair use is progressively limited (i.e., $z$ is increased), this will drive up transaction costs exponentially as $z$ becomes very high (i.e., when there is practically no fair use safety valve). For example, if every private photocopy of a newspaper article would require a formal license, the sheer number of transactions would become astronomical. The mere transactional costs of such a regime would engulf much of the societal benefit of the regime.

100. The metes and bounds of a physical object are easy to ascertain by simply observing the object. While disputes over the metes and bounds of real property are, or at least have been, common, it is possible to draw a border and ultimately, perhaps through judicial means, determine with high precision where one property ends and another begins. The metes and bounds of copyrights are not susceptible to any determinative clarity as to how far they extend. See, also, Stewart E. Sterk, *What's in a Name?: The Troublesome Analogies Between Real and Intellectual Property*, CARDOZO L. LEGAL STUD. RES. PAPER NO. 88 (Aug. 10, 2004), available at http://ssrn.com/abstract=575121.
As \( z \) increases, the judicial enforcement costs will also rise exponentially because there will necessarily be more claims of infringement, and claims of overlapping rights. In terms of copyright length, it has been argued that very long protection would likely begin inducing an anti-commons effect because older rights are more likely to be splintered either between heirs or various partial assignees or licensees.\(^{101}\)

Consequently, the functional relationship between these market imperfection costs (\( C_m \)) and \( z \) could be described as follows:

\[
C_m = h(z) \\
dC_m/dz = h'(z) > 0 \\
d^2 C_m/dz^2 = h''(z) > 0.
\]

One characterization of the slope of the societal cost of the copyright system from market imperfections could therefore be exponential, or:

\[
C_m = z^\gamma
\]

with \( \gamma > 1.0. \)

Consequently the total function \( C \) would consist of:

\[
C = g(z) + z^\gamma,
\]

which we represent in Figure 2.\(^{102}\)

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101. The conceptual premise of the anti-commons is that whereas the tragedy of the commons results in over-exploitation, rights that are splintered so as to enable holdouts opportunistically to prevent economic exploitation of resources creates a similar tragedy: that of under-exploitation. See, generally, Michael A. Heller, The Tragedy of the Anti-Commons: Property in the Transition from Marx to Markets, 111 HARV. L. REV. 621 (1998)

102. The total access costs \( C_{\text{TOTAL}} \) is the sum of the Coasean costs described in Section IV. B.1. and the market imperfection costs (\( C_m \)) discussed in Section IV. B.2. For the purposes of approximation in the diagram, we have portrayed the Coasean costs as linear.
These costs can also be seen directly as aggregate societal costs of the property regime because they will directly offset the benefits created by the incentive. Access costs manifest themselves as actually limiting output; in other words output that would have otherwise occurred as a result of the incentive benefit will not occur because of the more-than-offsetting access costs. It is important to note that on the cost side there is no equivalent of α, and that access costs at z = 0 are zero because in a system of no intellectual rights protection there would be no societal cost: since everything is freely usable, the value of the work is immediately conveyed to society.

C. Optimal Level of Copyright Protection

The societal net outcome of the copyright regime can be derived by combining the incentive benefit and access cost functions, which we portray in Figure 3:

![Figure 2: The Access Cost Relationship](image)
Since the net benefit is the vertical difference between the incentive benefit and access cost, we can portray the net societal welfare \( N \) simply as:

\[
N = W - C.
\]

The graphic portrayal of this function in Figure 4 creates an inverted parabola, which allows us easily to identify several points on the continuum \( 0 \leq z \leq 1 \). First, at \( z = 0 \) there is a net benefit to society, because even in the absence of any copyright protection there would be some creative works produced. However, as \( z \) increases we see that the net benefit to society increases, ultimately reaching the maximizing point of \( z^* \). After \( z^* \) the net benefit diminishes, ultimately sinking below the level that would be the case with no protection.
The quantification of the theoretical point for the aggregate $z^*$ is likely an impossible task. It would, however, appear possible to investigate the proper level of $z$ at least with respect to some of its sub-dimensions. More importantly, it might be helpful if societal decision makers would view the issue of copyright protection by applying the type of thinking presented in the model. Certainly, the model is implicitly used by both Congress in their efforts to devise the best possible copyright policy.  

At its extreme, truly to maximize the net societal surplus from copyright the levels of $z$ would likely need to be set differently for different types of copyrightable subject matter. For example, the substantial financial investment required to make a feature film likely would necessitate more property protection to sustain sufficient output compared to novelists, whose investment is primarily time. However, as a practical matter, a regime that would distinguish between the types of end products would likely be unwieldy so the model would serve the most purpose as a broad level guideline for

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103. In addition to fair use (17 U.S.C. §107) the Copyright Act contains numerous provisions where Congress has limited the exclusive rights of the copyright owners, ostensibly for the very reason discussed above, e.g., 17 U.S.C. §§108-111

104. See discussion in Section III D, supra; specifically Professor Scherer's and Nordhaus's notion that a fixed property grant is not optimal.
policy decisions related to the overall level of copyright propertization.

V. Orphan Works: A Practical Application of the Model

Although a precise numeric application of the model is likely to be empirically impossible, its conceptual ease lends it to be used when changes to the copyright regime are contemplated. Any change to copyright law is in essence a change in $z$ – by altering the status quo, the property grant on some dimension of the various aspects of copyright will be either strengthened or weakened as a result of the change. In the following, the model is applied to the Orphan Works Act, which would add a new Section §514 to the Copyright Act.

The Copyright Office issued a 133 page report to Congress entitled “Report on Orphan Works” in January 2006.105 The report was prepared in response to requests by Senators Orrin Hatch and Patrick Leahy, who would likely be sponsors of the new legislation proposed by the Copyright Office.

A. Orphan Works Act

The Orphan Works Act contains a new section §514 to be added to the Copyright Act.106 The proposed statutory language provides

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105. REPORT on ORPHAN WORKS, supra note 3.
106. The language of the bill provides: SECTION 514: LIMITATIONS ON REMEDIES: ORPHAN WORKS
(a) Notwithstanding sections 502 through 505, where the infringer:
(1) prior to the commencement of the infringement, performed a good faith, reasonably diligent search to locate the owner of the infringed copyright and the infringer did not locate that owner, and
(2) throughout the course of the infringement, provided attribution to the author and copyright owner of the work, if possible and as appropriate under the circumstances, the remedies for the infringement shall be limited as set forth in subsection (b).
(b) LIMITATIONS ON REMEDIES
(1) MONETARY RELIEF
(A) no award for monetary damages (including actual damages, statutory damages, costs or attorney's fees) shall be made other than an order requiring the infringer to pay reasonable compensation for the use of the infringed work; provided, however, that where the infringement is performed without any purpose of direct or indirect commercial advantage, such as through the sale of copies or phonorecords of the infringed work, and the infringer ceases the infringement expeditiously after receiving notice of the claim for infringement, no award of monetary relief shall be made.
(2) INJUNCTIVE RELIEF
(A) in the case where the infringer has prepared or commenced preparation of a derivative work that recasts, transforms or adapts the infringed work with a significant amount of the infringer's expression, any injunctive or equitable relief granted by the
that when an infringer has "performed a good faith, reasonably
diligent search to locate the owner" but failed to do so the subsequent
remedies of the copyright owner are limited. Specifically, "no
award for monetary damages shall be made other than requiring the
infringer to pay reasonable compensation for the use of the infringed
work." Similarly, unlike under the general provisions of the
Copyright Act, the copyright owner will not be granted injunctive
relief to prevent the copyright user from moving forward with his use
so long as reasonable compensation is paid.

The Orphan Works Act has been introduced in response to the
Copyright Office's factual finding that "the orphan works problem is
real." The Copyright Office's Report expressly recognizes that the
inability of a potential user to obtain the necessary licenses for the
copyright will result in the "productive and beneficial use of the work
[being] forestalled." This statement recognizes that the orphan
works problem is one of suppression of output. Derivative works that
could be created based on existing copyrights cannot be made
because risk-averse secondary users are not able to secure necessary
licenses. Such potential investors are precluded from the market
when there is a possibility that the owner of the original copyright will
emerge and demand excessive remuneration under the threat of an
infringement suit and an injunction. As the Report notes the situation
caused by the orphan works problem is not consistent with the public
interest, an objective of the copyright regime that the Copyright
Office thereby affirms.

court shall not restrain the infringer's continued preparation and use of the derivative
work, provided that the infringer makes payment of reasonable compensation to the
copyright owner for such preparation and ongoing use and provides attribution to the
author and copyright owner in a manner determined by the court as reasonable under the
circumstances; and
(B) in all other cases, the court may impose injunctive relief to prevent or restrain the
infringement in its entirety, but the relief shall to the extent practicable account for any
harm that the relief would cause the infringer due to the infringer's reliance on this
section in making the infringing use.
(c) Nothing in this section shall affect rights, limitations or defenses to copyright
infringement, including fair use, under this title.
(d) This section shall not apply to any infringement occurring after the date that is ten
years from date of enactment of this Act. REPORT ON ORPHAN WORKS, supra note 3,
at 127.

107. Id.
108. Id.
109. Id. at 7.
110. Id. at 15.
111. Id.
B. Economic Analysis of the Orphan Works Act

Since the Orphan Works Act entails a lowering of \( z \), the expectation is that it will reduce both the incentive-benefit and the access-cost. In the event that the diminution of the welfare resulting from the negative impact from the incentive-benefit is more than offset by the societal benefit of the reduced access costs, then the movement from \( z^a \) to \( z^b \) will have been in the direction of \( z^* \), as is portrayed in Figure 5:

![Figure 5: The Net Benefit-Cost of Propertization](image)

In the case of orphan works, at least in the limits that the Orphan Works Act entails, there is no possibility of a real debate about the matter. The reduction in the incentive-benefit would result from prospective creators being less motivated to make the necessary investment, because of their fears that their ability to extract control over the work will be diminished if the work should later be considered an orphan work. In essence, the proposal imposes an additional cost to the copyright claimant to inform the marketplace of its claim to the copyright and make his contact information available for possible licensing requests.\(^{112} \) It is implicit that this concern will have a minuscule impact on creative investment. Investment decisions

\(^{112} \) In a sense the Orphan Works proposal draws the sibling bodies of law of copyright and trademark closer; the Copyright Office's proposal brings into copyright what is essentially an abandonment doctrine that is well enshrined in trademark law.
in a creative work are highly unlikely to be discouraged as a result of this concern. At the time of the decision to engage in creative production, the thought of the work’s later being of interest to a potential user, but this user’s not being able to locate the copyright owner, is a remote consideration. The reduction in output as a result of this change will likely be nearly non-existent.

In contrast, on the access-cost side, the elimination of the barriers to use of orphan works can have a substantial output-enhancing impact. Under the present situation a copyright user has to incur substantial search costs in his attempt to locate the copyright owner. And, despite the investment, he may be unable to proceed, not because of an inability to agree on terms of use by the owner, but because the owner cannot be located. By analogy this could be viewed as a situation where an antique restorer finds a piece in a trash bin, but is not allowed to renovate it because of his inability to find who discarded it.113

Although a specific numeric analysis is not possible, a direct conceptual application of the model presented to the orphan works problem would indicate that the Orphan Works Act is consistent with the Constitutional objectives of copyright. The model presented in this article could be used as a tool in an express economic analysis of the societal benefits and costs of proposed changes, similar to what is customarily done with respect to policy decisions relating to antitrust.

VI. Conclusion

This article has presented a straightforward model for copyright that sets out the incentive/access paradigm in economic terms. The model suggests that for each dimension of copyright propertization, a social welfare maximizing point could be derived through empirical analysis. The article contends that in order for the copyright system to meet the utilitarian goals of the Constitution, Congress should use its ability to conduct the necessary analysis of the societal implications of proposed changes to the copyright regime before increasing (or decreasing) the property rights of copyright claimants. The Orphan

113. We recognize that orphan works are not always “discarded” in the sense of an antique in a trash bin. However, if a potential user cannot—despite reasonable diligence—find the copyright owner, it is possible that the copyright owner no longer considers the work as something in productive use. The concept of abandonment and renewable copyright terms is one that the Copyright Office should have at least given consideration as part of its Report. See William M. Landes & Richard A. Posner, Indefinitely Renewable Copyright, 70 U. CHI. L. REV. 471, 476 (2003); and LAWRENCE LESSIG, THE FUTURE OF IDEAS 215 (Random House 2001).
Works Act is an example of the implicit application of the model presented in this article.