CHICAGO

Indefinitely Renewable Copyright

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I. INTRODUCTION

In this paper we raise questions concerning the widely accepted proposition that economic efficiency requires that copyright protection should be limited in its duration.[2] The Constitution authorizes Congress to create copyright and patent protection "for limited Times."[3] The first federal copyright act was enacted in 1790 and provided for an initial term of 14 years plus a renewal term of the same length, provided the author was still living at the end of the initial term. The initial term was lengthened to 28 years in 1831, and the renewal term to 28 years in 1909 and to 47 years beginning in 1962. The Copyright Act of 1976 switched from a fixed to a variable, but still limited, term equal to the life of the author plus 50 years, increased to 70 years in 1998 by the Copyright Term Extension Act (popularly known as the "Sonny Bono" Act). Until the 1976 Act, federal copyright protection was largely limited to published works, other works being mainly protected by (state) common law copyright, which had no time limit, although an unpublished work could be federally copyrighted by being registered with the Copyright Office, and a substantial fraction of all federally copyrighted works were of this character.[4] Except in the case of works for hire (works in which the employer, or occasionally other hirers, of the actual creator of the work is the copyright owner), publication lost much of its significance under the 1976 Act, which protects work fixed in a tangible form, whether or not it is published. As for works for hire, the 1976 Act fixed a term of 75 years from publication or 100 years from creation, whichever expired first; the Sonny Bono Act extended these terms to 95 and 120 years. The 1976 Act also made works created January 1, 1978 nonrenew-

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[1] Landes is the Clifton R. Musser Professor of Law and Economics at the University of Chicago. Posner is a judge of the U.S. Court of Appeals for the Seventh Circuit and a senior lecturer at the University of Chicago Law School. We thank Louis Kaplow, Steven Shavell, and participants in the Harvard Law School's law and economics workshop (where a previous version of this paper was given on March 12, 2002), along with Michael Abramowicz, Scott Kieff, Lawrence Lessig, and especially Jane Ginsburg and Douglas Lichtman, for extensive and highly valuable comments on a previous draft, and Peter Broadbent, Bryan Dayton, and especially Brian Grill for their excellent research assistance.

[2] See, for example, Brief of George A. Akerlof, *et al.*, as Amici Curiae in Support of Petitioners in Eldred v. Ashcroft, U.S. Sup. Ct. No. 01–618, May 20, 2002.

[3] U.S. Const., art. I, § 8, cl. 8. On the history of this provision and specifically its reference to "limited Times," see the exhaustive treatment in Edward C. Walterscheid, "Defining the Patent and Copyright Term: Term Limits and the Intellectual Property Clause," 7 *Journal of Intellectual Property Law* 315 (2000). See generally Malla Pollack, "What Is Congress Supposed to Promote? Defining 'Progress' in Article I, Section 8, Clause 8 of the United States Constitution, or Introducing the Progress Clause" (forthcoming in *Nebraska Law Review*).

[4] From July 1, 1974 through September 30, 1977, unpublished works comprised about 30 percent of new copyright registrations. See the Annual Reports of the Register of Copyright for the years 1975-77.

able, but it allowed assignments and other transfers of copyrights to be terminated by the author or his heirs.

The legal significance of the Constitution's phrase "limited Times" is unclear (the motivation—a hostility deeply rooted in Anglo-American law and politics to government-conferred monopoly—is clear enough). Any time short of infinity, which is to say any fixed period of years, is "limited" in the literal sense of the word; and even if "limited" means something *far* short of infinity, this limitation might conceivably be got 'round by allowing repeated extensions of the copyright term. Renewals and extensions of patents and copyrights had been common in England in the eighteenth century, though on an individual rather than wholesale basis, and it was English practice that provided the model and inspiration for the copyright clause of the Constitution and for the early federal copyright statutes.[5] Then too, common law copyright (now largely preempted by the federal copyright statute, however) is perpetual; and so it is conceivable that states could recognize copyright after the expiration of federal copyright protection if the federal copyright law disclaimed any intention of preempting state law.[6] And while Congress could not grant perpetual copyright under the authority of the Constitution's copyright clause, maybe it could do so under other grants of power to Congress, such as the power to regulate interstate and foreign commerce. That seems unlikely, however, since the framers clearly intended to limit as well as confer congressional authority to grant patents and copyrights. In any event, we are interested in the economics of indefinitely renewing the copyright term and express no view on its legality, which may soon be decided by the Supreme Court.[7]

In this paper, we use the term "indefinite renewal" rather than "perpetual" copyright because there is an important economic difference between granting perpetual copyrights and granting copyrights for a limited time with, however, a right to renew the copyright as many times as the owner (including the original owner's heirs and other successors) wants. We recognize that the present system of fixed nonrenewable copyright terms and a system of indefinite renewals are not the only alternatives. In particular, a system of indefinite renewals could have an upper bound: perhaps an initial term of 20 years and a maximum of six renewal terms of 10 years each, for a maximum duration of 100 years. We shall consider this alternative to a "pure" system of indefinite renewals at various points in the paper.

Although a copyright that could be renewed indefinitely could turn out to be perpetual, this is unlikely for any but a tiny fraction of all copyrights. In the empirical analysis of the paper we shall see that fewer than 11 percent of the copyrights registered between 1883 and 1964 were renewed at the end of their

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[5] Walterscheid, note 3 above, at 355–356, 364.

[6] Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 166–167 (1989).

[7] See Eldred v. Reno, 239 F.3d 372 (D.C. Cir. 2001), certiorari granted under the name Eldred v. Ashcroft, 122 S. Ct. 1170 (2002).

28-year term, even though the cost of renewal was small.[8] And only a tiny fraction of the books ever published are still in print; for example, of 10,027 books published in the United States in 1930, only 174 were still in print in 2001—1.7 percent.[9] These data suggest that most copyrights depreciate rapidly and therefore that few would be renewed if even a slight fee were required; the sheer bother of applying for renewal appears to be a significant deterrent. The in-print data are indeed merely suggestive, since it costs more to keep a book in print than to renew a copyright and since a copyrighted work's derivative works may have commercial value after the original work has lost it. Nevertheless, it is apparent that even with an unlimited right of renewal the public domain would remain a vast repository of intellectual "property" (in a legal sense, nonproperty) available for use without charge and also usable as free inputs into the creation of new intellectual property. Paradoxically, a system of unlimited renewals might, depending on the length of the initial term and on the fee structure, *expand* the number of works in the public domain, although the average (and conceivably the total) value of the works in the public domain might fall since copyright in the most valuable works would probably be renewed many times.

Furthermore, it is a mistake to treat the public domain as some fixed supply of works from which any enlargement of copyright protection subtracts. The size of the public domain is in part a positive function of the extent of copyright protection, since, as a first approximation anyway, the more extensive that protection is, the greater the incentive to create intellectual property some fraction of which will become a part of the public domain when the copyright expires or, under the system we are suggesting, is not renewed.

The paper is organized as follows. Part II is a critical review of the economic arguments for limiting the duration of copyright protection. Part III questions the conventional view that the public-good character of intellectual property implies that once a copyrighted work falls into the public domain, it will be allocated and exploited efficiently; we show that just as an absence of property rights in tangible property would lead to inefficiencies, so intangible works denied copyright protection may be exploited inefficiently because of congestion externalities and because of impaired incentives to invest in maintaining and exploiting these works. Part IV presents our empirical analysis of the expected duration of copyrights and trademarks, using data on registra-

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[8] The renewal fee was $1 from 1909 to 1947, $2 from 1948 to 1965, $4 from 1966 to 1977, $6 from 1978 to 1990, $12 from 1991 to 1992, $20 from 1993 to 1999, and $45 from 2000 to the present. Prior to 1992, a copyright holder who wanted to renew his copyright had to file a renewal application during the last year of the initial copyright term. An amendment that year to the Copyright Act made renewals automatic, although there still are some benefits to filing for renewal registration. See Robert A. Gorman and Jane C. Ginsburg, *Copyright: Cases and Materials* 356–357 (6th ed. 2002).

[9] We are indebted for this computation to Lawrence Lessig, who based it on data in *American Library Annual and Book Trade Almanac for 1872–1957*; *The Bowker Annual* (same publication, new title) for 1974; and *Books in Print*, Bowker.com.

tions and renewals over the past 90 years. Our interest in trademark renewals derives from the fact that trademarks may be renewed indefinitely for 10-year periods, and an empirical analysis of these renewals may cast light on the likely performance of a system of indefinite renewals for copyrights. We find that both copyrights and trademarks are subject to significant depreciation and have an expected or average life of only about 15 years, and also that renewal rates are highly sensitive to renewal fees. These findings suggest that a system of indefinite copyright renewals need not starve the public domain. Part V is a brief conclusion.

II. THE ECONOMIC RATIONALE OF A LIMITED COPYRIGHT TERM

Two propositions are widely believed by most economists; it is the unrecognized tension between them that makes the question of a limited versus indefinite copyright term an interesting and difficult one. The first proposition is that so far as is feasible, all valuable resources, including copyrightable works, should be owned, in order to create incentives for their efficient exploitation and to avoid overuse. The second proposition is that copyright should be limited in duration. The reasons are several: (1) tracing costs increase with the length of copyright protection; (2) transaction costs may be prohibitive if creators of new intellectual property must obtain licenses to use all the previous intellectual property they seek to incorporate;[10] (3) because intellectual property is a public good, any positive price for its use will induce both consumers and creators of subsequent intellectual property to substitute inputs that cost society more to produce or are of lower quality, assuming (realistically however) that copyright holders cannot perfectly price discriminate;[11] (4) because of discounting to present value, incentives to create intellectual property are not materially affected by cutting off intellectual-property rights after many years, just as those incentives would not be materially affected if, during the limited copyright term, lucrative new markets for the copyrighted work, unforeseen when the work was created, emerged;[12] (5) in any event, retroactive extensions of copyright should not be granted, because such extensions do not

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[10] The point emphasized in our previous paper on copyright law, William M. Landes and Richard A. Posner, "An Economic Analysis of Copyright Law," 18 *Journal of Legal Studies* 325 (1989).

[11] The second and third points both rest on the fact emphasized in our article that creators of intellectual property characteristically build heavily on earlier such property rather than creating *ex nihilo*.

[12] One must be cautious, however, in asserting that "unforeseen" opportunities will not affect incentives. A particular new market may be unforeseen or unanticipated yet may be part of a *class* of markets that when the work was created had a foreseen, positive probability of coming into existence, and therefore may have influenced the incentive to create the work. See generally Jane C. Ginsburg, "Copyright and Control over New Technologies of Dissemination," 101 *Columbia Law Review* 1613 (2001).

affect the incentive to create works already in existence;[13] but (6) the possibility of such extensions invites rent seeking.

These six points taken together imply that the optimal term of copyright protection is determined by balancing at the margin the incentive effects of a longer term against both the administrative and the access costs arising from the public goods aspect of intellectual property; by "access costs" we mean both the deadweight losses from limiting output and the transaction costs involved in obtaining a license from the copyright owner granting access to a copyrighted work. Since the incremental incentive to create new works as a function of a longer term is likely to be very small (given discounting and depreciation) beyond a term of 25 years or so,[14] access costs will tend to dominate, implying an optimal copyright term considerably shorter than the current term of life plus 70 years. Thus the second proposition denies the first (valuable resources should be owned) and asserts that copyrightable intellectual property should be taken out of private ownership and placed in the public domain after a period of years no greater than necessary to induce the socially efficient incentives to create new works. But is the second proposition sound? It may be, for there undoubtedly are cases in which property rights cost more than they are worth (a homely example: shopping malls that do not charge for parking, thus treating their parking lot as a commons). It has seemed so to many students of copyright, but its soundness no longer seems obvious to us.[15]

A. Tracing Costs

The argument for limiting copyright duration because of tracing costs is superficial except in explaining why common law copyright in unpublished works was (before the 1976 Copyright Act) perpetual: because there is usually only one copy of such works, the cost of determining the copyright holder's identity is trivial unless the copy has passed through many hands.[16] The argument for limiting duration is superficial in other contexts not because the costs of tracing the ownership of copyrighted works are inherently slight but

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[13] Not literally zero, because knowledge of the possibility of a future lengthening of the copyright term might have some, though probably very small, incentive effects.

[14] For example, suppose a copyright would yield $1 per year in perpetuity at a discount rate of 10 percent. Under a system of perpetual copyright, the present value of this infinite stream of income would equal $10 ($=1/r$). Under a limited copyright term ($=t$) the present value would be $(1-e^{-rt})/r$. Hence if $t=25$ and r=.10, the present value of $1 per year for 25 years is $9.18, which is more than 90 percent of the present value of a perpetual copyright. If the value of the copyright depreciates by, say, 5 percent per year, the difference in present value between a perpetual and 25-year copyright is only about 2½ percent ($6.67 versus $6.51).

[15] See Landes and Posner, note 9 above, for the arguments in favor of a limited term.

[16] An example is the discovery of a unpublished manuscript in the library of Harvard University of a novel entitled *Inheritance*, written by Louisa May Alcott in 1849. It had been miscatalogued for many years and no one knew of its existence. Although Alcott was childless, the copyright holders—fourth-generation descendants of Alcott's father—were not difficult to locate. See Lawrence Van Gelder, "Uncovered at Harvard: Alcott's First Novel," *N.Y. Times*, May 1, 1996, p. C15.

because they could probably be made slight by modest institutional reforms. Enormous tracing costs would be incurred by any would-be publisher of a new translation of the *Iliad* if the heirs of Homer could enforce copyright in the work, but that is only because no one knows who those heirs are. Equally immense tracing costs would be required to determine the ownership of a parcel of land if title to land were not recorded in a public registry. It is not perpetual property rights but absence of registration that creates prohibitive tracing costs.

Were a system of indefinitely renewable copyright to be instituted today but limited to works created after the system was in place, there need be no great difficulty in identifying copyright owners a century or for that matter a millennium hence if, for example, the law required copyright owners to reregister their copyrights every 10 or even 25 years in some central registry under the name of the copyright holder and to notify the registry in the event the copyright was transferred. The owner would be required to provide the registry with his address and notify it of any changes of address; a transferee would likewise be required to furnish this information to the registry. Then a search of the registry under the name of the original owner would reveal the address of the copyright holder from whom a license would have to be sought. The analogy is to the registries in which titles to real estate are recorded and to the Uniform Commercial Code registries in which security interests in personal property are recorded. A fee would be charged for renewing a copyright registration in recognition of the costs imposed on the registry itself and on the searchers. The fee could exceed those costs if it were desired to expand the public domain by discouraging renewals of works unlikely to have much commercial value.

Tracing costs could be reduced further by requiring, when feasible, that a notice of copyright be placed on copyrighted works. Such a notice, which would be a precondition of copyright protection, would indicate the name of the copyright holder and the date of the most recent copyright registration or renewal.[17] This would enable a potential user to determine readily whether the work was still protected and whom to get in touch with if a license had to be obtained. Notice would reduce tracing costs because the registry would have to be searched only for the subset of works that were still under copyright.

Under existing law, the point at which copyright protection begins is relatively unimportant because the duration of protection is determined not by that starting point but instead (except in the case of works for hire) by the

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[17] For some works, it is true, up-to-date notices would not be feasible or would be too costly relative to the potential benefits in lowering tracing costs. Suppose, for example, that *A* sells a work of art but retains the copyright. *A* may be unable to place an up-to-date copyright notice on a work that has been out of *A*'s possession for many years. Other problems associated with copyright notices must also be considered. For example, a strict notice requirement might result in cluttering up a work of art with multiple notices that would detract from the artistic merits of the work. Even in this case, it might be possible to place a notice of the back of the canvas or on the back of the pedestal on which a sculpture stands.

death of the author. Under a system of renewals, the starting point becomes critical. So our suggested system would require a return to something like the pre-1976 law, where copyright protection generally began with publication or registration; but we do not explore these details in this paper.

We acknowledge a possible concern with joint ownership of copyrights; the more owners there are of a property, the greater will be the tracing and transaction costs. But these problems arise in the case of land and other physical property and are dealt with in a variety of ways, such as by forming a trust or corporation to own or operate the property, or by allowing partition, and problems of joint ownership of copyrights can be solved in similar ways. The counterpart to partition is the right of any joint owner of a copyright to license its use, subject to a duty to account for the profits to the other owners. Tracing and transaction costs reduce the value of property to its owner, thus giving them an incentive to reduce these costs by consolidating ownership or control.

B. Transaction Costs

The transaction-costs argument against indefinite renewal (compared to life plus 70 years or a single renewal term) is stronger than the argument from tracing costs but must not be exaggerated. Transaction costs, like tracing costs, might actually be lower under a system of indefinite renewal, though this would depend on how the system was configured, in particular on the length of the initial and renewal terms and on the renewal fee. Although transaction costs would be incurred each time a copyright was renewed, consisting mainly of the time costs of the copyright holder and the costs of administering the renewal system, these costs would be slight if most copyrights were not renewed—and the longer the initial term and the higher the renewal fee, the fewer would be renewed.

The transaction costs incurred in negotiating for the licensing of that minority of works the copyright on which has been renewed many times would often be higher. In many cases, it is true, a new work that potentially infringes the copyright on a very old one will infringe only a single work—for example (if there had been indefinitely renewable copyright from the beginning of time) *Ulysses* and the *Odyssey*, the movie *Clueless* and the novel *Emma*, *West Side Story* and *Romeo and Juliet*, *Ragtime* and *Michael Kohlhaas*. And in that event transaction costs should not be very high, provided that copyright protection is narrow and excludes ideas, *mise en scène*, and other aspects of expressive works that go beyond the very specific, narrowly defined form or configuration of the copyrighted work. And provided too that there is a broad fair-use doctrine that protects, for example, parodies of copyrighted works from being treated as infringement. But these are settled and economically rational features of copyright law that we would not suggest be changed.

Transaction costs would be greatest for composite works, such as anthologies. Under existing law, the publisher of a collection of the world's greatest poems need obtain copyright licenses for only a subset of the poems—none first

published before 1923.[18] Under a regime of indefinitely renewable copyright instituted say in 1500 A.D., most of the poems in an anthology of popular poetry might still be under copyright protection and therefore many more licenses would have to be obtained for a new anthology.

The aggregate transaction costs of a system of indefinite copyright renewals would depend on the number (and possibly the value) of licenses (holding tracing costs constant), the transaction costs per license, and the administrative cost of operating a renewal system. Since the number of licenses would depend in part on the total number of works renewed, aggregate transaction costs could actually fall compared to a system of automatic renewals or a single term of life plus 70 years.

We do not wish to be dogmatic about transaction costs, since their magnitude has not been estimated. If they are thought to be very great and especially if they are believed to increase exponentially with increases in copyright duration, this could be a compelling argument for placing an upper bound on the duration of copyright under a system of (finite) renewal. Return for a moment to the example of *West Side Story* and *Romeo and Juliet*. Shakespeare's play copied extensively from an earlier *Romeo and Juliet* which in turn copied the plot from Ovid's story of Pyramus and Thisbe. Had copyright been in force since Ovid's day and if Ovid's heirs had renewed it right up to the present, the producer of *West Side Story* might have to get a license from those heirs as well as from Shakespeare's heirs (and doubtless from the heirs of the author of the earlier *Romeo and Juliet* as well), assuming the Ovidian license obtained by Shakespeare was limited as it would normally be to Shakespeare's use of Ovid's story in his own works.

C. Public Goods

The public-good argument for limiting the copyright term is valid but overstated. The argument is best understood with the aid of an example. Suppose the marginal cost of manufacturing and distributing a copy of some novel is $1, there are no fixed production costs (typesetting and editing costs are zero), but the author incurs a cost of $1000 (mainly opportunity cost) to write the book—call this the cost of expression. This is a fixed cost, which because it does not vary with output does not influence output. As a result, in the absence of copyright, competition among publishers will expand output to the point at which the price of the book falls to $1, which will just cover the publisher's manufacturing and distribution costs and leave nothing with which to compensate the author for his efforts. The incentive of authors to write books will diminish, and with it the supply of new copyrightable works.[19] Copyright protection en-

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[18] The copyright on a work first published in 1922 would terminate after 75 years (a 28-year initial term plus a 47-year renewal term) or in 1997. The Sonny Bono Act adds an additional 20 years protection to works still protected in 1998.

[19] For a discussion of why some works would still be produced, and of alterative ways in which authors might still receive financial compensation in the absence of copyright protection, see Landes and Posner, note 9 above.

ables the publisher to charge a price above $1 without worrying about competition from unauthorized copies. A price of, say, $2 would more than cover the publisher's costs and enable a financial return to the author, encouraging him to create new valuable works. But charging a $2 price generates an offsetting social cost. Potential users who value the copyrighted work at more than $1 but less than $2 will substitute other goods. The result will be a loss of value (deadweight loss) equal to the difference between these users' willingness to pay and the $1 marginal cost. Viewed as an institution for promoting economic efficiency, the copyright system seeks to balance the incentive gains from pricing expressive works above marginal cost against the deadweight and other costs. Protection beyond that point would yield additional benefits that were more than offset by the higher costs.

From this standpoint, however, it may seem puzzling that the copyright term is so long today, let alone that we should be suggesting that it might be made even longer by being made renewable indefinitely. On the one hand, the present value of $1,000 in royalties to be received 95 years from now (life plus 70 years for a work written when the author was 25) is trivial, given any plausible discount rate. On the other hand, such a long term of copyright protection can create access (deadweight plus transaction) costs by reducing the number of works at any given time that are in the public domain and can therefore be appropriated without need to obtain a license.

But this analysis is superficial in two respects. First, just as future revenues must be discounted to present value to determine their value, so future deadweight costs must be discounted to present value to determine their present cost.[20] If the present value of some remote future benefit is trivial, so is the present cost of the equally remote future deadweight loss. Second, because the scope of copyright protection is, as noted earlier, very narrow, the size of the deadweight loss created by copyright protection is likely to be relatively small. The narrower the scope of a property right, the more good substitutes there are, the less the owner's monopoly power is, therefore, and so the smaller is the deadweight loss that the monopoly creates. It has even been argued that the optimal duration of a patent would be infinite if the scope of patent protection were narrowed appropriately.[21] Conceivably the scope of copyright protection is already so narrow that an infinite copyright term would not be a source of significant deadweight loss. But this is merely a conjecture (are there good substitutes, for example, for Shakespeare's plays or Mozart's piano concertos?), and one reason the scope is narrow is that the public domain provides a source of free inputs into the creation of new copyrightable works. If valuable works

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[20] But at the same rate? Future benefits should be discounted at the private discount rate because we are concerned with their incentive effect. Future deadweight costs should be discounted at a social discount rate lower than the private rate if it is believed that society has an interest in its future inhabitants greater than individuals have for their remote descendants. We do not pursue this issue in this paper.

[21] Richard Gilbert and Carl Shapiro, "Optimal Patent Length and Breadth," 21 *RAND Journal of Economics* 106 (1990).

are withheld from the public domain because the copyright term has been extended, there may be significantly fewer public domain works (weighting number by quality) upon which to draw, which will reduce competition with existing copyrightable works.

Our earlier point about the need to discount future deadweight costs loses most of its force, moreover, if the question is whether to extend the term of existing rather than future copyrights, at least existing copyrights that, unless extended, will soon expire. Suppose a copyright that was about to expire is extended another 20 years. The deadweight costs will begin to accrue immediately. They still must be discounted, but the present cost will be much greater than if the discounting were merely of deadweight costs that were to be incurred in a period beginning 75 years from now.[22] The case for a system of indefinite renewals may thus be stronger if it is limited to copyrights obtained after the system is instituted, although a potentially offsetting benefit, reduced rent seeking, of a system not limited to future copyrights will be noted shortly.

The length of the initial and renewal terms, the fee charged for renewal, and the scope of renewal (would it be limited to a single work, or could it cover a group of works?), can be adjusted to produce, as a practical matter, whatever copyright term is deemed socially desirable; nor need the length, fee, or scope by the same for all classes of work (books, software, music, etc.). The shorter the initial grant (it could be as short as 5 or 10 years) and the higher the renewal fee, the shorter the de facto term and so the fewer the number of works that will be protected by copyright. The *composition* of the public domain might well differ under an indefinite-renewal system, because there would be better sorting of works into two categories: (1) valuable works, where the benefits of property rights may exceed the costs, and (2) works of little value, where the costs of administering copyright protection are very likely to exceed the benefits and a stiff renewal fee would discourage the owner from seeking continuing copyright protection. We argue that this sorting may produce a more efficient system of copyright than the present system.

D. Rent Seeking

Owners of copyrights on old but still commercially valuable works have an incentive to incur lobbying and related expenses to persuade Congress to extend the copyright term on these works. Retroactive extensions do not enhance incentives to create expressive works, so if those incentives are the only benefits from copyright, such extensions will increase access and transaction costs without producing any offsetting value. Moreover, as we just saw, they can be a potent source of deadweight costs.

Consider Disney's successful efforts to lobby for the Sonny Bono Act that retroactively extended its copyrights by 20 years in order to protect its soon-to-

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[22] This point is emphasized in the economists' amicus curiae brief in the *Eldred* case, note 2 above, at 11.

expire copyrights on Mickey Mouse and other cartoon characters.[23] The costs of these efforts, and of the unsuccessful efforts of competing interests to oppose the extension, were incurred to obtain and limit economic rents, respectively, and if there are no offsetting social benefits these costs were wasted from a social standpoint.

Rent-seeking activities are a natural consequence of any fixed copyright term, since the Congress that enacts the term cannot prevent future Congresses from increasing the term retroactively. There will always be some copyright holders whose income will be diminished when their works fall into the public domain, and they have an incentive to seek retroactive extensions as the end of the copyright term draws near. The problem of rent seeking that arises from the possibility of retroactive extensions of copyrights would be solved by indefinite renewals, though an alternative would be to interpret the copyright clause of the Constitution to forbid retroactive suspensions. Since indefinite renewals would eliminate the prospect of losing the income produced by old but still valuable copyrights, there would be little incentive to lobby for copyright extensions. We say "little" rather than "no" because resources might still be spent lobbying for lower renewal fees and longer renewal terms. But normally it would be cheaper to pay the renewal fee than to try to change the law. Notice, however, that a system of indefinite renewals that was limited to future copyrights would fail to curb the incentive to seek retroactive extensions of existing copyrights. Notice, too, that fixing an upper bound to renewals would leave the rent-seeking problem unsolved, since as the work approached expiration, if it retained commercial value the copyright holder would have an incentive to lobby for a right of further renewal.

It might be objected that allowing indefinite renewals would eliminate only one form of rent-seeking, because copyrights have other dimensions of value, notably scope, besides duration. However, whatever incentive there exists for lobbying for expansions of scope exists under the current system; it would not be greater under a system of indefinite renewals.

III. RATIONING AND MAINTAINING INTELLECTUAL PROPERTY
A. Congestion Externalities

If we are correct so far, the *average* copyright duration could well be shorter under a system of indefinite renewals than under the current system. Such a system might therefore reduce access costs for most but not all works compared to the present system. (It probably would not reduce deadweight costs, because these presumably are generated mainly by valuable copyrights, which would tend to be renewed.) The public-goods argument asserts, however, that whatever the case with regard to costs, there are no efficiency or social benefits from continuing indefinitely to protect even a small number of valu-

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[23] See Janet Wasko, *Understanding Disney: The Manufacture of Fantasy* 85–86 (2001). The Act went into effect Oct. 27, 1998, four years before the copyright on Mickey Mouse would have expired.

able works, and it is this issue that we now take up. The argument assumes that the only justification for copyright protection is the incentives it produces to create new works. This may be wrong, or even anachronistic, since until the 1976 Copyright Act federal copyright protection attached at dissemination or registration rather than at creation

The economic theory of property rights emphasizes not only their incentive effects, that is, the investment that they encourage, but also their effect in optimizing current uses of property. Frank Knight made this argument many years ago, using the example of highway congestion.[24] An example closer to intellectual property is a natural pasture. The significance of its being natural rather than cultivated is to abstract from the incentive benefits of recognizing a property right in it. The natural pasture is not created by human effort and therefore there is no social value in encouraging investments in creating it. But in the absence of property rights the pasture would be overgrazed because none of the users would take account of the cost that his use imposed on the other users by making their cattle graze more to obtain the same amount of food. Thus property rights would create a benefit unrelated to encouraging the creation of new property.

Analogous benefits of property rights are recognized in some areas of intellectual property. They are recognized in trademark law, which does not impose any fixed limitation on the duration of a trademark, since confusion would result if the same trademark denoted goods of different provenance and quality, and which, through the concept of "dilution," protects trademark owners from the loss of value resulting from nonconfusing duplication of their trademarks (as where a hot-dog stand adopts the name "Tiffany's"). And increasingly they are recognized in the law of publicity rights as well, which prevent others from using one's name or likeness in advertising or other commercial uses without one's permission. The tendency is to make these rights inheritable.[25] The motive is not to encourage greater investment in becoming a celebrity (the incremental encouragement would doubtless be minimal), but to prevent the premature exhaustion of the commercial value of the celebrity's name or likeness.[26]

Recognition of an "overgrazing" problem in copyrightable works has lagged. Typical is the statement of a large group of professors of intellectual property in opposition to the Sonny Bono Act:

> The fundamental difference between tangible and intellectual property is that intellectual property is a nondepletable commons, while tangible property necessarily depletes with use. "The trag-

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[24] Frank Knight, "Some Fallacies in the Interpretation of Social Cost," 38 *Quarterly Journal of Economics* 582 (1924).

[25] See Mark F. Grady, "A Positive Economic Theory of the Right of Publicity," 1 *UCLA Entertainment Law Review* 97, 124–126 (1994). See also Douglas G. Baird, "Does Bogart Get Scale? Rights of Publicity in the Digital Age," 4 *Green Bag* (2d ser.) 357, 363–364 (2001).

[26] See Grady, note 22 above, at 103, 126.

> edy of the commons" is that failure to recognize perpetual and transferable property rights in tangible property leads inevitably to "overgrazing," as soon as an item of property enters the public domain from which everyone may draw freely. Recognition of perpetual property rights leads to economic efficiency, because a rational owner will optimize the balance between present and future consumption.
>
> There can be no overgrazing of intellectual property, however, because intellectual property is not destroyed or even diminished by consumption. Once a work is created, its intellectual content is infinitely multipliable.[27]

This is overstated, if only because it ignores the trademark and right-of-publicity cases—both examples of intellectual property. But before proceeding further, we must distinguish between technological and merely pecuniary externalities. The externality in the pasture case is technological because it imposes a real cost on third parties (the other grazers), rather than merely altering the distribution of wealth. Refusing to recognize inheritable publicity rights could impose either type of externality, or both types. If anyone could use Humphrey Bogart's name or likeness in advertising, the aggregate value of that advertising use might be greater even though Bogart's estate would lose income. Indeed, if the marginal cost of additional copies of his image were zero, the marginal utility would also be zero, even though the total utility could be very great. But the total utility might fall if the lack of excludability and resulting proliferation of the Bogart image led to confusion, the tarnishing of the image, or sheer boredom on the part of the consuming public. Eventually the image might become worthless.

Apparently this is a concern of the Walt Disney Company with regard to its copyrighted characters, such as Mickey Mouse. "To avoid overkill, Disney manages its character portfolio with care. It has hundreds of characters on its books, many of them just waiting to be called out of retirement…Disney practices good husbandry of its characters and extends the life of its brands by not overexposing them…They avoid debasing the currency."[28]

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[27] Denis S. Karjala, "Statement of Copyright and Intellectual Property Law Professors in Opposition to H.R. 604, H.R. 2589, and S. 505, The Copyright Term Extension Act, Submitted to the Joint Committees of the Judiciary," Jan. 28, 1998.

[28] Bill Britt, "International Marketing: Disney's Global Goals," *Marketing*, May 17, 1990, pp. —, —.
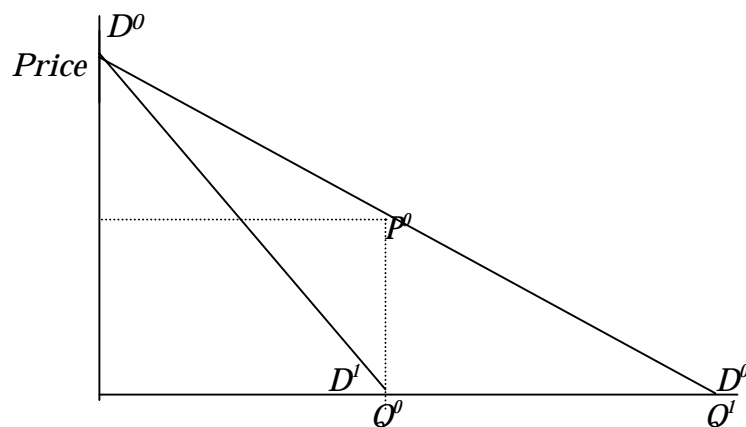
FIGURE 1
COPYRIGHT EXTERNALITIES

Figure 1 illustrates the problem. $D^0 D^0$ is the demand schedule in period t. Assume that the work has been under copyright for so long that if the copyright expired today the expected return to the author would have been sufficient to induce its creation. By assumption, therefore, copyright protection in period t and all future periods would have no effect on whether the work was created in period $t = 0$. It would create a deadweight cost illustrated by the $P^0 Q^1 Q^0$ triangle in Figure 1, which is caused by the copyright holder's charging a price equal to P^0 although marginal cost is zero. Terminating the copyright in t would eliminate the deadweight loss, as the number of uses of the work would increase to Q^1, i.e., until the value of the marginal use equaled zero. But now suppose that contrary to the usual assumption about copyrights, additional uses impose technological externalities. Then terminating the copyright will lead not only to a movement along the demand curve but also to a downward shift (say to $D^0 D^1$) in the overall demand, destroying value equal to the difference between the area under the original demand curve $D^0 D^0$ up to P^0 and the area under $D^0 D^1$ up to a zero price. If the externalities are small, the difference between the two demand curves could be negative, so that terminating the copyright at t would increase value. But if they are large, termination will result in a net loss in value. In the limit, additional uses beyond Q^0 might depress the demand curve (as it rotates downward around the point that intersects the vertical axis at D^0) until it coincided with the vertical axis. In that event, terminating the copyright would have destroyed all its previous value—the area under $D^0 D^0$ from point that intersects the vertical axis to the initial price and quantity of P^0 and Q^0.

But how far is the concern with technological externalities that has been flagged in reference to publicity rights actually applicable to copyright? A book or other copyrightable property is, as we noted earlier, a public good; its use by one consumer does not interfere with its use by any other. This point cannot be decisive, however; a celebrity's name or likeness has public good characteristics as well, yet unlimited reproduction of the name or the likeness could prematurely exhaust the celebrity's commercial value, just as unlimited drilling

from a common pool of oil or gas would deplete the pool prematurely. The same could be true of a novel or a movie or a comic-book character or a piece of music or painting, particularly with regard to copyrights on components of completed works rather than on the completed works themselves. If because copyright had expired anyone were free to incorporate the Mickey Mouse character in a book, movie, song, etc., the value of the character might plummet. Not only would the public rapidly tire of Mickey Mouse, but his image would be blurred, as some authors portrayed him as a Casanova, others as catmeat, others as an animal-rights advocate, still others as the henpecked husband of Minnie. In effect, there would be both a movement along and shift downward in the demand curve in Figure 1 until Mickey Mouse's commercial value was zero.[29] To the extent that such appropriations of the Mickey Mouse character were classified as parodies, they would be sheltered by the fair-use doctrine. But not all would be so classified,[30] and in that event the fair-use doctrine would not insulate them from liability under a regime of indefinitely renewable copyright.

We do not wish to press the argument too far. While examples can be given of even works of elite culture that have been debased by unlimited reproduction (the *Mona Lisa*, the opening of Beethoven's *Fifth Symphony*, and several of Van Gogh's most popular paintings come immediately to mind), there are counterexamples, such as the works of Shakespeare, which seem undiminished by the proliferation of performances and derivative works, some of them kitsch, such as Shakespeare T-shirts and the movie *Shakespeare in Love*.

B. Creation and Copying from the Public Domain

A second economic argument against limiting the duration of copyright is unrelated to congestion or overuse externalities. It returns us to the question of incentives. The conventional economic criticism of unlimited duration draws too sharp a distinction between creation and copying. Imagine a novel published many years ago in which copyright has expired. The novelist is rediscovered and there is a surge in demand for his novels. Since no publisher could establish a property right in them, the incentives of publishers to publish and promote them might well be inadequate from a social standpoint. Often the

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[29] In contrast, in the absence of negative technological externalities, terminating the copyright would reduce the marginal value to zero. But since the demand curve would be unchanged, total value would increase because there would be no deadweight cost from termination.

[30] The line the law draws in implementing the fair-use defense to copyright infringement is between complementarity and substitution (or between productive and substitutable uses for the copyrighted work), see, for example, Wendy J. Gordon, "Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors," 82 *Columbia Law Review* 1600, 1643 n. 237 (1982); or, so far as relevant to our example, between parody and burlesque. See Richard A. Posner, "When Is Parody Fair Use?" 21 *Journal of Legal Studies* 67 (1992). Uses of the Mickey Mouse character that were intended to provide the audience with a substitute for the Disney Corporation's productions incorporating the character would not be considered fair use. See Ty, Inc. v. Publications International, Ltd., 2002 WL 1068020, at *2 (7th Cir. May 30, 2002).

demand for particular works of intellectual property is unknown before they actually hit the market.[31] Suppose an enterprising publisher has only a 20 percent chance of success with obscure public-domain authors. He publishes the works of five such authors in order to have one success. In the absence of copyright protection, other publishers can wait and see which author sells and then bring out their own version of his works. Publishers who wait avoid the costs of failure, but their free riding on the market information developed by the first to publish reduces the incentive of any publisher to search for potentially successful public domain works.[32] The tendency would be for only works of already well-known and safe authors whose works were in the public domain to be published.

Granted, a system of indefinite renewals is not a panacea for this problem, since works that were no longer popular would tend not be renewed many times. This problem would exist even if copyright were perpetual rather than either duration-limited or indefinitely renewable, since owners of a perpetual copyright that they considered worthless would not take even modest steps to assure the continued registration (for example, notifying the registry of changes of address) that a system of perpetual, as of indefinitely renewable, copyrights would require be established, as we discussed earlier. A complete solution would require that the "resurrectors" of old works on which copyright had expired without renewal, like finders in the law of real property, be allowed to obtain copyright in those works. We consider that possibility later. For now, it is enough to observe that a system of indefinite renewals would, depending on the fee, on whether group renewals were permitted, and on the formalities involved in renewal, somewhat mitigate the problem of incentives to invest in public-domain works.

Here is another such problem: a publisher would have an incentive to make changes in any public domain work that he did revive, since he could copyright the changes; but changes made merely to stake a claim are socially inefficient. They may create private value for the publisher, but from a social standpoint they impose higher real costs net of any value created by the publisher's changes. In other words, extension of the copyright term might reduce socially excessive product differentiation.[33]

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[31] This has been noted in connection with dolls and other goods portraying dead celebrities. See Ronald Alsop, "Items Portraying Dead Stars Produce Profits Controversy," *Wall Street Journal*, May 10, 1984, § 1, p. 37.

[32] In other words, "a work's public domain status is far from an unqualified incentive for utilizing it…Some of the obvious concerns are whether a copyrighted derivative work will have to compete with other, often low-budget, low quality copies and whether the producer of the copyrighted derivative of a public domain work is likely to have anything unique in the long run." Arthur R. Miller, "Copyright Term Extension: Boon for American Creators and the American Economy," 45 *Journal of the Copyright Law Society of the United States* 319, 324 (1998).

[33] Two qualifications should be noted. One is that the publisher's changes in the public domain work may be too slight to support a copyright in the derivative work. See L. Batlin & Son v. Snyder, 536 F.2d 486, 491 (2d Cir. 1976) (en banc), for the proposition that to support a copyright in a derivative work based on a public domain work "there must be at least some sub-

Conversely, if because of its age the novel were in need of an elaborate scholarly apparatus, re-editing, or other costly additions to make it readily accessible to a modern readership, publishers might be reluctant to undertake the needed measures, even if they could copyright the scholarly apparatus (which they could not do to the extent it was deemed a matter of ideas rather than expression), fearing that the cost could not be recouped in the face of competition from cheap, barebones editions of the novel. Reviewers might use the scholarly apparatus, of course without compensation, to explain the book to the public, who would then buy the barebones edition.

Shakespeare comes to mind here, because the texts of his plays are notably corrupt; also because it is uncertain that we have all the texts of his plays and poems. There is a considerable industry in trying to improve the accuracy of the texts and discover new works by Shakespeare, but it is entirely academic; despite Shakespeare's popularity, there does not appear to be a significant commercial market for the "maintenance" required to maximize the value of Shakespeare's works. (Cutting the other way, however, is the fact that the royalty-free availability of his works reduces the "maintenance" cost to cost-conscious academics.)

A parallel example would be that of an old movie, on which copyright had expired, that a studio wanted to issue in a colorized version that would be very expensive to prepare. Promoting the colorized version might increase the demand for the black and white version, a close substitute for the colorized version. Since anyone could copy and sell the black and white version, the studio considering colorization would not take into account, in deciding whether to colorize, the increase in demand for the black and white version. As a result, the expected revenue from colorization might be less than the (private) costs and so the movie studio would decide against it.[34] This is a good example of a case in which indefinite renewal might be a complete solution, since, given the public's avidity for movies old as well as new, an old movie would be quite likely to retain enough value to warrant the expense of renewal.

The essential points are illustrated by the copyright on Mickey Mouse. First, the character has changed in appearance over the years since it was first created,[35] indicating continued investment after the initial creation of the

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stantial variation, not merely a trivial variation such as might occur in the translation to a different medium." The other qualification is that even if the publisher can copyright the derivative work, a third party can copy the underlying public domain work from the derivative work without infringing the copyright. See Feist Publications, Inc. v. Rural Telephone Service, 499 U.S. 340, 359 (S.Ct. 1991)

[34] The implication of this point—that colorization is less likely for movies in the public domain than for those still under copyright—is empirically testable.

[35] For a long time, the changes were in the direction of making Mickey distinctly more youthful appearing. See (with pictures) Stephen Jay Gould, *The Panda's Thumb: More Reflections in Natural History*, ch. 9 (1980). Recently, however, we learn that "Mickey Mouse—70 years old in 1998—is getting a makeover, along with other familiar Disney cartoon characters. No more cutesy, innocuous, not-a-care-in-the-world pet mouse, MM's about to become more in-tune with his true rodency and the edgier times and becomes a harried, '90s creature." "After 70 Years,

copyrighted work. Second, should the copyright be fated to expire, Disney would have an incentive before expiration to change the character further so that, by copyrighting the changes, it might impede imitations. A further complication is that Mickey Mouse is a Disney trademark,[36] and trademarks have no fixed expiration date. After the copyright expired, copiers would still need to disclaim a Disney origin in order to avoid trademark infringement; such disclaimers, like conspicuous notices on paintings, might impair the commercial value of the copy by marring its appearance.

These examples, unlike the analysis of publicity rights and our extension of that analysis to copyright, show that a case against a definite time limit for copyrights can be based on the traditional incentive-based argument for property rights, though with a new twist. The new twist is recognition that the need to invest in intellectual property to maximize its value is not exhausted in the initial creation of the property. Investment is necessary to maintain the value of the property as well, and also to resurrect abandoned or otherwise unexploited intellectual property.[37]

Magnitudes are critical, and in the absence of them only tentative conclusions are possible.[38] The reader should recall, however, the theoretical reasons to doubt that the extension of the copyright term via renewals is likely to impose large tracing, transaction, or deadweight costs, provided that copyrights already existing when the system of renewals is adopted are not eligible to be renewed, since extensions of existing copyrights, as we noted, can impose very large deadweight costs. On the other side of the balance, besides the unknown significance of congestion externalities in the copyright context, we are told that the Disney corporation has spent tens of millions of dollars refurbishing Mickey Mouse, both by subtle alterations in the character and by situating it in carefully selected entertainment contexts in an effort to increase the appeal of Mickey Mouse to the current generation of young children, who apparently

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Mickey Mouse Develops an Edge," http://www.mickey-mouse.com/pressreleases.htm. The piece quotes a media analyst as saying that the character "has progressively been stripped of his original cheekiness and aggression until the perception is that he is not more than a brand name. He needs a strong new identity."

[36] Indeed, Mickey's "primary role today is as the corporate logo of the [Walt Disney] company." Wasko, note 21 above, at 125.

[37] This is not an entirely novel point. "For a work to be commercially successful, it requires effort and investment which, while not 'creative,' is still necessary to generate value. For example, authors employ literary agents, publishers advertise, etc. With musical composition and photographs, the collection, arrangement and indexing of the works adds value. With film, preservation requires constant attention. Even the straightforward act of printing a book entails a risk on investment. Arguably, none of these activities will be pursued as vigorously on behalf of public domain works as they are for works with ownership rights. And, from an economic point of view, these activities 'create' real value." Edward Rappaport, "Copyright Term Extension: Estimating the Economic Values" 4 (Congressional Research Service May 11, 1998).

[38] Rappaport states that the effect he describes "may be important in some cases, but, we believe, will more often be marginal." Id. But he does not explain the reasoning or evidence that leads him to this conclusion.

have little interest in him. The incentive to make such expenditures would be impaired if the copyright expired, allowing anyone to use the character, though the copier could not copy any newly copyrightable features that Disney had added to the original character.[39] (Granted, this would be an important qualification should it turn out that only the most recent version of the character retains commercial appeal; but that seems doubtful.) At the same time, however, extending the Mickey Mouse copyright, a highly valuable existing copyright, would be likely to impose substantial deadweight costs, which might well exceed the incentive-promoting and congestion-reducing benefits that we have identified.

We conjecture that the reason so few classical composers are recorded and performed is that it is more costly to produce a musical composition than it is, say, to photograph a painting. The recording company that discovered and revived the works of a forgotten or obscure composer would be risking a substantial amount of money in an uncertain venture that could be imitated if successful. Much less expense would be involved in publishing a book, or even arranging an exhibition, of works of a forgotten or obscure painter. The absence of property rights in the music of well-known classical composers may also explain another feature of the recording industry. Many different recording companies record the same public domain works of Beethoven, Mozart, Bach and other well-known composers. Recording companies differentiate their product by promoting the performer or artist who has signed an exclusive contract with the company. Because the recording company can, for example, copyright the Chicago Symphony Orchestra's recording of Beethoven's *Fifth Symphony*, it has an incentive to promote that version; it has little incentive to promote the public domain work of an unknown composer, since it could not appropriate the benefits of those promotional efforts, as distinct from benefits that might accrue from a recorded performance of the unknown composer's work by a popular performer.

Consider also the effect on the recording of a composer's obscure works when his copyrights expire. Our analysis implies that upon the expiration of Puccini's copyrights, the rate at which his obscure works were recorded fell relative to recordings of the best-known works, since an investment in creating

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[39] The public legislative history of Sonny Bono Act says little about the 20-year addition to the duration of copyrights on works for hire, such as the Disney copyrights. The main rationale given for the extension for individuals (remember that the Act extended the term for individuals from life plus 50 years to life plus 70 years) is (1) balance of payments and (2) the fact that people are living longer (Irving Berlin being a pertinent example). The second point makes very little sense, since an increase in longevity will automatically increase the length of the copyright term measured from the author's death, unless the concern is with the longevity of his heirs. first point is mercantilist, reflecting the fact that the United States is a net exporter of intellectual property.) One of the committee reports does, however, explain that the extension of the copyright term "will provide the important collateral benefit of creating incentives to preserve existing works [in digital format."] Rep. No. 315, 104th Cong., 2d Sess. 13 (1996). This is a point similar to our colorization example.

a demand for the obscure works would be more difficult to recoup once the works were no longer under copyright.

If our analysis is correct, Lawrence Lessig's criticism of the retroactive extension of the Mickey Mouse copyright[40] overlooks important though, in the present state of knowledge, inconclusive economic arguments for extended copyright protection that are independent of whether the protection is extended ex ante or ex post,[41] though, as we have seen, ex post extension involves greater deadweight costs but lower rent-seeking costs. If the method of extension was periodic renewal, then, since Congress could cut off the right of renewal at any time, a law authorizing renewals without limit of number would be less vulnerable to a constitutional challenge than a grant of perpetual copyright *ab initio*—the latter being flatly inconsistent with granting a copyright for "limited Times." Periodic renewal would also have the superior economizing properties that we have emphasized.

But it would not address the case in which intellectual property that has fallen into the public domain by abandonment is sought to be revived. Suppose Tobias Smollett had copyrighted his books but after a few renewals his heirs had decided the books had no value and so declined to pay the renewal fee. Our analysis implies that a publisher who wants to publish Smollett's books today should be permitted to take out copyright on them, by analogy to the rule that allows finders to obtain title to abandoned (as distinct from merely misplaced) property. Unfortunately, the efficient implementation of such a rule is considerably more complicated in the case of intellectual than of physical property. In the latter case allowing abandoned property to be withdrawn from the public domain unproblematically implements the policy that valuable property should be owned in order to create the correct incentives for its exploitation. But imagine a "finder" of intellectual property who claimed to have found, and who sought to obtain copyright in and register, all the books in the British Library on which copyright had expired. Such a claim, if honored, would be tantamount to "banking" trademarks by simply listing all possible combinations of the letters of the alphabet, and would create the rent-seeking and transaction-cost problems that we have elsewhere discussed in the trademark context.[42]

The problem may not be insoluble. One way to deal with it would be to limit the acquisition of copyright in previously created works to works created after the law authorizing such acquisition was passed. Another would be to require the publication of such a work within a specified period of time after copyright was claimed in it. Another would be to charge a stiff fee for registering such a copyright.

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[40] See references to these and other retroactive extensions in Lawrence Lessig, *The Future of Ideas: The Fate of the Commons in a Connected World* 295 n. 8 (2001).

[41] See id. at 197–198.

[42] See William M. Landes and Richard A. Posner, "Trademark Law: An Economic Perspective," 30 *Journal of Law and Economics* 265, 281–283 (1987).

We have yet to consider an important though not fatal objection both to indefinite renewals and to allowing even limited copyright protection for "found" public domain works. These measures, as we have seen, would create incentives for firms to expend resources on discovering and disseminating obscure public domain works and on maintaining consumer interest in copyrighted works that were about to fall into the public domain (the Mickey Mouse example). But these are not expenditures on creating expressive works; they are marketing expenditures, which are not within the traditional domain of intellectual-property law. Why should a particular subset of such expenditures be singled out for legal protection? Firms that introduce wine and cigar bars, develop movies about wars in outer space, recognize the potential for health clubs that combine workout and social activities, or introduce baggy trousers or pastel colors for clothing cannot prevent other firms from imitating their marketing innovations. Trademark law may prevent confusingly close imitation and copyright law may protect particular advertising slogans, but these laws do not prevent competitors from free riding on the information developed by the innovators.

However, there are at least three possible economic reasons for singling out the particular marketing expenditures in issue for protection by copyright law. First, the distinction between expressive works and the marketing *of those works* is overdrawn. Consider a record company that develops, promotes, and distributes new pop records. A few of them will be financial successes but the others will lose money. Which will be hits and which will be flops is not knowable in advance. In the absence of copyright protection—and here we are speaking just of protection against the copying of the sound recordings themselves—unauthorized copying of the hit records will drive their price down to their cost of manufacture and distribution and leave nothing for covering the costs incurred in developing and promoting recordings of new songs and new performers. Copyright protection enables the record company to earn enough money on the hits to cover both their costs and the production and marketing costs of the many failures. In effect, copyright indirectly prevents free riding on marketing and information expenditures that are similar to the expenditures incurred in rediscovering obscure public domain works and in maintaining interest in soon-to-expire copyrighted works.[43] To state this another way, exploring the market for expressive works, the sort of exploration that the measures we are discussing would encourage, is a stage in the creation of intellectual property.

Second, marketing expenditures associated with expressive works differ from those associated with the other examples of new products given above

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[43] This concern is explicit in 303(a) of the Copyright Act, which discourages free riding on marketing and promotion expenditures of previously unpublished works about to fall into the public domain by conditioning an additional 45 years of protection on publication. Thus, copyright on works unpublished on January 1, 1978, continues until December 31, 2002, but if published by that date, protection continues until December 31, 2047.

(wine and cigar bars, health clubs, and so forth) because it is easier in the former case to identify the innovator. Many people could probably make credible claims of being the first to come up with the idea of baggy pants or pastel shades of clothing or combining exercise and social opportunities under the same roof. Having the legal system try to sort out these competing claims would involve substantial costs that would usually be avoided when someone was seeking to restore a copyright in an obscure public domain work and would never arise when one was seeking merely to renew an existing copyright.

Third, many new business ideas may now be legally protectable by "business method" patents. Such protection often provides incentives for firms to invest in marketing and promotion that would be subject to free riding in the absence of protection.

IV. Empirical Analysis of Copyright Registrations and Renewals

Data on copyright registrations and renewals during the past 100 years bear directly on the subject of this paper. If it turned out that all or most copyrighted works created before the 1976 Copyright Act (which became effective on July 1, 1978) were renewed, the implication would be that a system of indefinite renewals might approach perpetual copyright, though this would also depend on how steep the renewal fee was. Conversely, if renewals are infrequent even under the current system of nominal fees,[44] then probably only a relatively few highly valuable works would remain under copyright beyond the initial term even if indefinite renewals were permitted.

A. The Data

The U.S. Copyright Office publishes data on registrations and renewals.[45] Although the number of registrations is only a proxy for the number of copyrighted works because registration has always been optional, the 1909 and 1976 copyright acts created strong incentives to register a copyright and to register it promptly. Not only is registration (or, under the 1976 Act, an application to register) a prerequisite for filing a suit for infringement, [46] but it must be done before the infringement (or within three months of first publication) if the copyright holder wants to recover statutory damages and attorney fees. As noted earlier, the 1909 Act fixed the copyright term at 28 years from the date of first publication (or, for works that were copyrighted but not published, from

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[44] See note 7 above.

[45] See *Annual Report of the Register of Copyrights*, various years, published by the U.S. Copyright Office. See also Barbara A. Ringer, "Renewal of Copyright," in *Studies on Copyright: Arthur Fisher Memorial Edition*, vol. 1, p. 503 (1963 [1960]).

[46] Under the Berne Convention Implementation Act of 1988, the registration requirement only applies to a "United States work"—i.e., a work first published in the United States or where the author is United States national or lives here. See Sec. 101 for a complete definition of an "United States work."

the date of registration), and at the end of the term the copyright could be renewed for an additional 28 years (raised to 47 years in 1962 and to 67 years in October 1998) if the copyright holder applied for renewal within the last year of the initial term. Beginning in 1992 renewal became automatic,[47] so renewal registrations were sure to decline after that, but not to zero because there was still an incentive to file, mainly because a renewal registration is prima facie evidence of the validity of the copyright during its extended term and of the facts stated in the certificate of renewal. Another important change in the law was the extension of federal protection by the 1976 Act from published works to all works fixed in a tangible medium, whether or not they are published. This change could be expected to increase the number of registrations without any increase in the output of copyrightable works.

Our primary focus is on renewals because they allow us to estimate the expected economic life of a copyright.[48] But we need data on registration as well because the number of initial registrations determines the number of works that are potentially renewable 28 years later. For example, works renewed in 1938 were registered initially in 1910. To obtain the number of 1910 registrations, however, we have to deduct renewal registrations in 1910 (from works first copyrighted in 1882) because the Copyright Office includes renewal registrations in its tabulation of registrations.

B. Copyright Registrations and Renewals

Figures 2, 3, and 4 illustrate registrations, renewals, and the renewal/registration ratio, respectively, over the past century; the renewal/registration ratio in year t being simply the number of renewals in t divided by the number of initial registrations in $t - 28$.

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[47] Remember that these are renewals of copyrights that date from before the effective date of the 1976 Act, which gave the copyright owner a nonrenewable term of life plus 50 (later 70) years.

[48] Economists have used patent application and renewal data to estimate the expected life and distribution of patent values. For a summary of these studies, see Jean O. Lanjouw, Ariel Pakes, and Jonathan Putnam, "How to Count Patents and Value Intellectual Property: Uses of Patent Renewal and Application Data," 46 *Journal of Industrial Economics* 405 (1998). See also note 64 below.

FIGURE 2
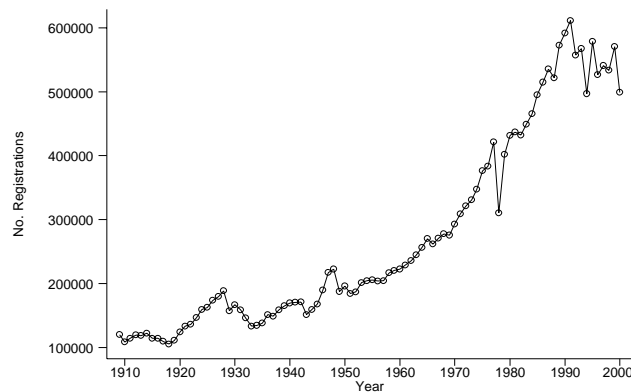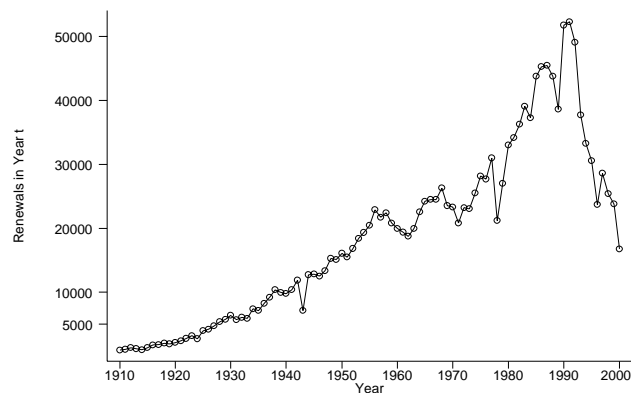**COPYRIGHT REGISTRATIONS (EXCLUDING RENEWALS)**
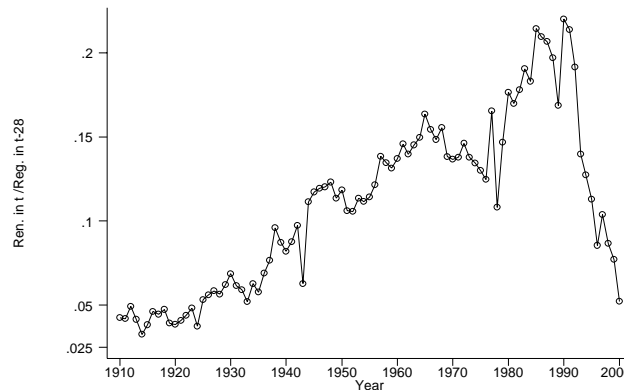

FIGURE 3
RENEWALS IN YEAR T

Figures 2 and 3 reveal that copyright registrations and renewals rose rapidly in the twentieth century, but that, as expected, renewals began to decline in 1992 when they became automatic.[49] The rise doubtless reflects an increase in the number of copyrightable works brought about by growth in the output of expressive activities, as well as reflecting changes in the copyright law. Why, then, did both registrations and renewals peak in 1991, declining by almost 20 percent by 2000, with the decline concentrated in the last year? The answer may be, in part anyway, that the registration fee was doubled in 1991, from $10 to $20, and increased again in 2000, to $30, while the renewal fee was doubled to $12 in 1991, rose to $20 in 1993, and more than doubled, to $45, in 2000. Although these fees seem small in relation to the inconvenience of registering and complying with other requirements of registration, such as submis-

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[49] Recall that the 1909 Copyright Act (effective July 1, 1909) extended the renewal term from 14 to 28 years. Works that been renewed for 14 years in the period 1895 to 1909 were entitled to a further renewal of 14 years, for a total renewal period of 28 years. We do not include the 14-year extensions in our count of renewals in the 1910 to 1923 period. Our analysis of renewal data begins with the fiscal year ending June 30, 1910, the first fiscal year of the 1909 Act.

sion of a copy of the work to the Copyright Office,[50] Figures 2 and 3 suggest substantial negative responses to higher fees for both original and renewal registrations. The effect on the latter is more ambiguous, of course, because of the automatic renewal amendment in 1992, although the amendment did not eliminate all incentive to register a renewal, since by doing so an author could recapture rights in already created derivative works

FIGURE 4
RATIO OF RENEWALS IN T TO REGISTRATIONS IN T – 28

As Figure 4 shows, the fraction of works renewed increased significantly between 1910 and 1991, then plummeted—no doubt mainly because of automatic renewal, though higher fees may also have played a role.[51] Prior to 1992 (the first fiscal year for automatic renewal), renewal rates ranged from a low of .03 in 1914 to a high of .22 in 1991. Although the full cost of renewal includes both a small renewal fee and the monetary equivalent (probably small) of the inconvenience and other costs associated with renewal, the fact that a small fraction of works are renewed implies that most copyrights have very little economic value after 28 years. Put differently, the decision to renew a copy-

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[50] Another reason for the decline in registrations may be that since March 1989 registration has no longer been a condition for bringing an infringement suit for foreign works protected by the Berne Convention and the World Trade Organization, though it is remains a prerequisite for seeking statutory damages and attorneys fees. The fact has little quantitative importance, however, because foreign works are only a small fraction of copyright registrations. See text at note 54 below.

[51] We analyze the impact of fee changes in the regression analysis below, but point out here that it would be a mistake to think that the ratio of renewals to registrations should not change in response to higher fees for *both* renewals and registrations. The mistake lies in failing to note that the ratio of renewals to registrations is calculated from renewals in year *t* and registrations in year *t*–28, and obviously an increase in fees in 1991 could not affect the number of registrations in 1963, the denominator in the 1991 ratio. The only effect of higher fees on that ratio would come through the effect of a higher renewal fee on the number of renewals that year. Note also that the renewal ratio in Figure 4 is biased downward from 1910 to 1937 because registrations data from 1881 to 1909 include both new registrations and 14 year renewal registrations (from works first registered in 1867 to 1895). We account for this bias in our regression analysis

right depends upon a comparison of the discounted value of the expected future revenues from the copyright compared to the full costs of renewal. If the latter exceeds the former, the copyright will not be renewed. Since only a small fraction of works are renewed, it follows that the expected economic value of the 80 percent or so of copyrighted works that are not renewed is less than the small cost of renewal. The analysis would not be changed in essentials if, to reduce administrative costs, an owner of copyrights made a one-time decision to renew all his copyrights when they expired.

Of course, we cannot dismiss the possibility that some fraction of nonrenewals are due to simple oversight, or careless failure to comply with required formalities. Ignorance of renewal formalities is possible even when the work was initially registered, as the book or other work may have gone out of print (or the equivalent for nonbooks), the copyright may have reverted to the author by contract, and the author may not know about renewal or the renewal date. Nonrenewals by corporations or other owners of works for hire might therefore be a better index of decisions not to renew based on lack of commercial value; but we do not have those data.

If, as both the raw data in Figures 2 and 3 and the regression analysis indicate, registrations and renewals respond significantly to modest changes in fees, it is likely that (1) the size of the public domain will expand under a system of indefinite renewals compared to the present copyright system; (2) the average value of works in the public domain will decline; (3) the expected economic life of most copyrighted works is short;[52] and (4) a system of indefinite renewals, at least if limited to works copyrighted after the system is created, will separate valuable works in which continued copyright protection may be socially efficient from works in which the cost of continuing that protection almost certainly exceeds the sum of administrative and access (including transaction) costs.

C. Depreciation and the Economic Life of Copyrights

Depreciation rates of copyrighted material can be calculated from data on renewals and registrations. Initial registrations constitute one year's stock of copyrighted works. Renewal registrations of those works constitute a different, smaller stock of the same works 28 years later (renewals must be registered in the last year of the initial term). The annual rate at which the first stock shrinks to become the second is the depreciation rate of the first stock. That rate is given by $REN_t = (REG_{t-28})e^{-\delta_t 28}$ where REN_t denotes renewals in t of works registered 28 years earlier ($=REG_{t-28}$) and δ_t equals the annual average depreciation rate for copyrights registered in period t-28. Figure 5 depicts annual depreciation rates, measured in year t, of works registered 28 years earlier. Thus the depreciation rate of .054 in 1990 (5.4 percent) is the annual de-

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[52] The actual life of some of these works is longer; an author may err in his estimate of the demand for his work and therefore fail to renew his copyright, though in fact the work has continued value.

preciation rate of works registered in 1962. The higher the renewal ratio, of course, the lower the depreciation rate, since we are computing the depreciation rate from the fraction of copyrighted works that are renewed.

Figure 5 indicates that the average annual depreciation rate of copyrighted works has ranged from a low of 5.4 percent in 1990 to a high of 12.2 percent in 1914 (for works first registered in 1886), the overall average being 8.3 percent.[53] The long-term trend (setting to one side the effect, beginning in 1992, of automatic renewal) is toward lower depreciation, implying that copyrightable works have become more valuable. One reason may be the increase beginning in 1962 in the renewal term from 28 to 47 years, which increased the present value of copyrights by extending their potential term. But given discounting, the effect should not have been great, and so it is not surprising that most of the decline in the depreciation rate occurred before 1962.

Why there was *any* decline in depreciation is unclear, however. Even if the demand for copyrightable works has been growing, the supply of new works would be expected to respond at roughly the same rate in order to keep the real value of copyrights roughly constant. One possible reason for the decline in depreciation is that new technologies, such as long-playing records, stereo equipment, radio, and television, have extended the economic life of copyrights. For example, the growth in demand for prerecorded music made possible by technological advances such as radio and television broadcasting, high-quality home stereo systems, and even the automobile (which increases the number of people listening to radio) should have increased the overall demand for copyrighted music. Some of this demand would be satisfied by older though still copyrighted music, resulting in higher renewal rates and hence a lower depreciation rate.

FIGURE 5
ANNUAL DEPRECIATION OF REGISTERED COPYRIGHTS

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[53] As noted earlier, estimates of depreciation for the years 1910 to 1937 are biased downward because registration data in the period 1882 to 1909 include renewal registrations.

Here we should mention a complication arising from the fact that as a result of the signing of the Berne Convention by the United States, copyright protection was restored for a number of works that were protected in their country of origin but had fallen into the public domain in this country, mainly because of failure to comply with the requirements of notice or renewal. This has two potential effects on the calculation of depreciation. First, if foreign works were less likely to be renewed (or more likely to fall into the public domain because of improper notice) than U.S. works, depreciation of the latter would be lower than shown in Figure 5. Second, the size of the public domain would be smaller today. These effects are likely to have only a negligible impact on our empirical analysis, however, because we estimate that foreign works constitute only between 1 and 5 percent of copyright registrations.[54]

The reciprocal of depreciation is the average expected life of a copyrighted work. Although the statutory term of copyright works first published in the period 1881 through 1972 and renewed for a second term varied from 56 to 95 years, the commercial life $(=1/\delta)$ of the average copyrighted work was much lower, ranging from 8.19 years to 18.5 years for works first registered in 1886 and 1962, respectively. In the first group, 3.3 percent were renewed (in 1914); in the second, 22 percent were renewed (1990).

It is also possible to estimate the number of works registered in 1934 that retain commercial value today. We chose that year because works first published then could be renewed for 47 years in 1962, and another 20 years were tacked on in 1998, so that a copyright first registered in 1934 need not enter the public domain until 2029. Yet the estimated depreciation rate of works registered in 1934 is .07, implying that of the works registered that year 50 percent had fully depreciated by 1944, 90 percent by 1977, and 99 percent by 2000; fewer than 1 in 750 works registered in 1934 will have commercial value in 2030. Had renewals been permitted every five or ten years, then after an initial term of 20 or so years about 99 percent of the works registered in 1934 would have fallen into the public domain by the year 2000 because by then their commercial value had fallen below the cost and inconvenience of renewal. Of course, the 1 percent that would still be under copyright would mainly be the more valuable and enduring works.

D. Depreciation Rates for Books, Graphic Arts, and Music

The Copyright Office publishes separate data on registrations and renewals for books (including, however, pamphlets—which indeed account for 80 percent of the category), music, and graphic arts (applied art, posters, fine arts, labels, photographs, technical drawings, and maps). As shown in Figure 6, the time trend of these three categories closely tracks the time trend of overall registrations (the correlation is .99). This is not surprising, because these categories account for 70 percent of all registrations.

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[54] We were able to obtain foreign registrations for only some of the years between 1961 and 1977, however.

FIGURE 6
**REGISTRATIONS OF ALL COPYRIGHTS, BOOKS, MUSIC,
AND GRAPHIC ARTS**
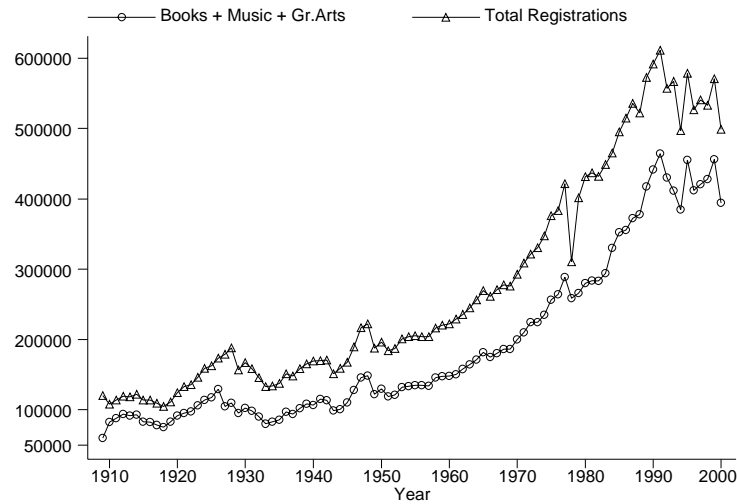
In Figure 7 we see that the number of musical copyrights has grown the fastest, the number of book copyrights the second fastest, and graphic arts the slowest. We estimated simple regressions of the form $log\ y_t = a + rt + u$, where y denotes either book, music, or graphic art registrations, t time, and u the residual. The coefficient r, which measures the rate of growth per year, equaled .021 (24.5) for books, .025 (41.5) for music, and .014 (7.44) for graphic arts. The t-statistics (in parentheses) indicate that these growth rates are highly significant.[55] The differences in growth rates between any two of the three categories are also statistically significant.

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[55] However, books include periodicals for the 1909–1926 period, which artificially increases the number of book registrations in that period and so lowers the estimated rate of growth. If we estimate the growth rate from 1927 (rather than 1909) to 2000, the coefficients (and t-statistics) on r are .024 (27.4) for books, .026 (33.3) for music, and .022 (12.8) for graphic arts. Although the growth rates for books and music are much closer, all differences remain statistically significant at the .10 level.

FIGURE 7
SEPARATE REGISTRATIONS FOR BOOKS, MUSIC,
AND GRAPHIC ARTS
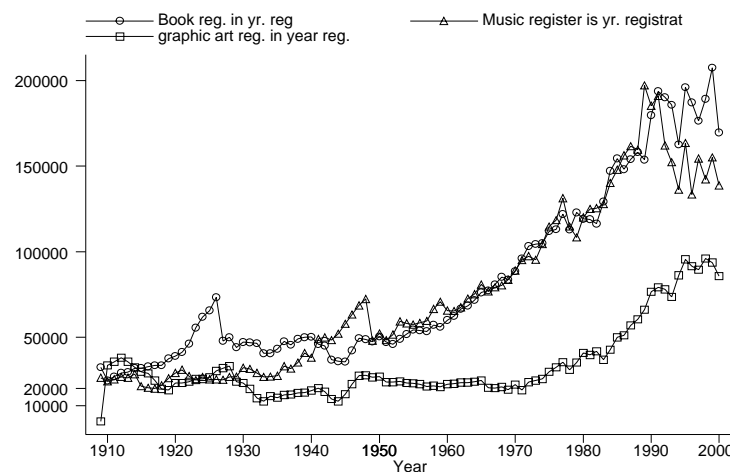
We can also link up renewals with registrations for each of the three categories to estimate category-specific depreciation rates, though since the earliest category-specific registration data we have are for 1909, we can only use renewal data starting in 1937. Figures 8 and 9 graph the renewal ratio and depreciation rates.

FIGURE 8
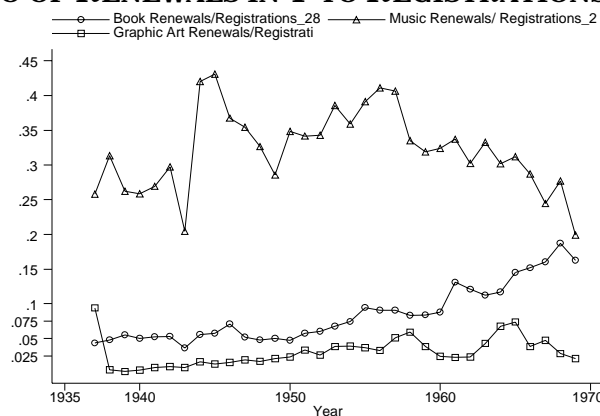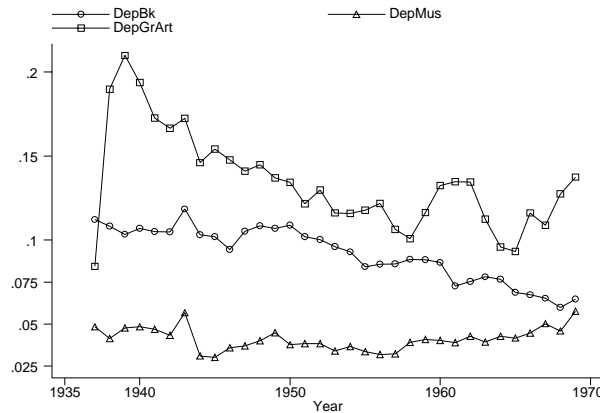**THE RATIO OF RENEWALS IN T TO REGISTRATIONS IN T–28**

FIGURE 9
DEPRECIATION IN T OF REGISTRATIONS IN T-28

Notice that only about 3 percent of graphic-arts works were renewed after 28 years, compared to 8 percent for books and 32 percent for music which peaked at more than 40 percent for works renewed in 1944 and 1956. Music renewal rates have been falling sharply since 1956, while book renewal rates have been rising during this period so that by 1969 renewal rates were greater for books than music for works first copyrighted in 1942. By the same token, depreciation rates are highest for graphic arts (averaging about 14 percent) and lowest for music (about 4 percent), with books in the middle (above 9 per-cent).[56] We also observe declining depreciation rates for both books and graphic arts, while depreciation of music began to increase in the mid-1950s and by 1969 was just slightly below that of books.

What explains these differences? The graphic-arts category is dominated by commercial art, such as advertising layouts and fabric designs for fashion items, the useful life of which tends to be no longer than the advertising cam-paign or latest fashion season. (Mickey Mouse is a dramatic exception.) At the other extreme, music written for one use can have many other uses in the fu-ture. For example, a song written for a Broadway show might be recorded by many different artists over a long period of time or be used as background mu-sic in a movie or a television program.[57] In addition, music is less tied to cul-tural change than purely verbal works, which are often extremely topical and

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[56] We noted earlier that of 10,027 books published in 1930, only 174 were still in print in 2001. An annual depreciation rate of 5.7 percent would produce this more than fifty-fold decline. From our data, we estimate a depreciation rate of 8.9 percent for books registered in 1930, but this is the average rate over the period 1930 to 1958 (the date of renewal). Overall, the depre-ciation rate for books is 9.2 percent for books registered between 1909 and 1941. The probable explanation for the discrepancy between this rate and the 5.7 percent estimate is the fact noted in the text that the book category in our data includes pamphlets and leaflets, which tend to be ephemeral.

[57] Rappaport, note 36 above, at 3 n. 5 remarks that "in the case of music,…its 'timeless' quality allows themes to be recycled endlessly." Notice, however, that depreciation rates of music rose in the 1956 to 1969 period, suggesting that more recent popular music is less durable than works created in the 1920s and earlier.

therefore depreciate rapidly. Books are more enduring than most applied art if only because the costs of storing them is relatively low and there is some chance of turning a book into a movie or rekindling interest in the author.

Whatever the reasons for the differences in depreciation rates across these categories, the differences bolster the case for indefinite renewals. Current copyright law does not differentiate among different types of work. All copyrightable works, from computer programs to novels to installation art (which is typically site-specific and lasts only the length of the exhibition), have the identical term despite the large differences in commercial life expectancy. A system of indefinite renewals would automatically distinguish the enduring from the ephemeral. Most works of graphic art probably would not be renewed even if the initial term were only five years. Because books and music are likely to have more lasting value, their renewal rates would be greater. We have seen that it may be socially beneficial to continue property rights in—and only in—intellectual property that retains sufficient value to offset access and administrative costs, because of the investment disincentives and congestion externalities that are likely to result when valuable property is unowned.

E. Regression Analysis

We can use multiple regression analysis to estimate the impact on registrations and renewals of changes in fees, statutory changes in copyright law, and changes in the underlying demand for expressive works. Tables 1 (registrations) and 2 (renewals) present the results of our regression analysis, which provide additional insight into the likely effects of a system of indefinite renewals.

The dependent variable in Table 1 is the logarithm of the annual number of registrations in the period 1910 to 2000. We present both OLS (ordinary least squares) and Cochrane-Orcutt estimates (the latter to correct for significant autocorrelation). The independent variables in equations (1.1) and (1.2) are a time trend (*Year*), the copyright registration or renewal fee (*LogFee*) deflated by the Consumer Price Index (CPI), the expected copyright duration (*LogE(Life)*) computed from our estimates of depreciation, and annual recreation expenditure (*LogRecExp*) that are for expressive (and thus often copyrighted) works of music, movies, books, and periodicals),[58] also deflated by the CPI. The registration, fee, duration, and recreational-expenditure variables are in log form; their regression coefficients are therefore elasticities. Equations (1.3) and (1.4) add several dummy variables denoting significant changes in the copyright statute that are likely to effect the number of registrations. These include the 1962 amendment extending the renewal term to 47 years (*1962RenExt*), the extension of copyright protection to sound recordings in 1972 (*1972Sound*), the 1976 Copyright Act, effective in 1978 (*1976Act*), the

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[58] We estimate that expenditures on expressive goods account for about 50 percent of the recreation category.

1988 ratification of the Berne Convention effective in 1989 (*1988Berne*)[59] and the 1998 (Sonny Bono) Copyright Term Extension Act (*1998BonoExt)*, which added 20 years to the copyright term. These variables take a value of 1 for all years in which the given change is in effect and of 0 otherwise.

All four equations reveal a significant growth rate of copyright registrations of about 1 to 2 percent per year. The time trend variable (*Year*) picks up increases in population, income, wealth, and education that are positively correlated with time over the 90-year period covered by our data and are likely to increase the demand for expressive activities. A positive time trend was visible in Figure 2, but regression analysis enables us to conclude that the trend is the result of (or at least is positively correlated with) an increase in the underlying growth in demand for expressive activities rather than of changes in fees, the law, or other policy variables. Although the regression coefficients on recreation expenditures are positive in all the equations in Table 1, only the OLS estimates (equations (1.1) and (1.3)) are statistically significant.

The most interesting result in Table 1 is the negative and highly significant effect of registration fees (t-statistics between 4.6 and 9.1) on registrations. The coefficients on fees yield a negative elasticity of around .20, implying that a 25 percent increase in fees would reduce copyright registrations by more than 5 percent, even though fees are very small. (For example, the registration fee in 2000 was only $30, and it had averaged only $20.48 in 2000 dollars over the 1910 to 2000 period.) The implication is that most copyrights have negligible expected value, because even very small increases in already very low fees deter many owners of intellectual property from seeking to register it. While registration is now optional rather than a precondition of obtaining a copyright, it confers procedural advantages that should motivate any copyright holder who thinks his work retains significant commercial value to register his copyright.

The number of registrations is also highly responsive to the expected commercial life (*LogE(Life)*) of a work, which for all but a few works is shorter than the statutory copyright term. For example, a 10 percent increase in that expected life leads, other things being equal, to a 3.2 percent increase in registrations in equation (1.4), and this effect is highly significant statistically.[60]

Of the remaining variables, only the 1976 Copyright Act and 1988 Berne Convention dummy variables have statistically significant effects on registrations after we adjust for autocorrelation. Extending the renewal term in 1962 and adding sound recordings to the Copyright Act in 1972 have positive and significant effects on registrations in the OLS but not in the Cochrane-Orcutt estimates. It is not surprising that the term-extension variables (in 1962 and

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[59] The Copyright Act was amended in 1988 (effective in March 1989) to comply with the substantive provisions of the Berne Convention. The most significant amendment was to make copyright notice optional.

[60] The only exception to the significant effect of *LogE(Life)* is equation (1.1). But the significance of this equation in our analysis is marginal because it does not adjust for autocorrelation and excludes five important statutory variables.

1998) are insignificant, because the expected commercial life of a copyrighted work is so much shorter than the copyright term, making an increase in the term irrelevant to most potential registrants. Amendments to the Copyright Act that accompanied ratification of the Berne Convention are associated with about a 10 percent increase in registrations. These amendments (e.g., notice and the need to record some transfers and licenses became optional) effectively lowered the full cost (including inconvenience costs) of registration, which in turn should increase the number of registrations.[61]

TABLE 1
REGRESSION ANALYSIS OF REGISTRATIONS
(t-STATISTICS IN PARENTHESES)

Independent Variables	Log Registrations			
	OLS (1.1)	COREG (1.2)	OLS (1.3)	COREG (1.4)
Year	.013 (3.71)	.018 (5.44)	.005 (1.88)	.018 (4.78)
LogFee	−.31 (9.06)	−.24 (5.57)	−19 (5.93)	−.20 (4.67)
LogE(Life)	.07 (.79)	.35 (3.79)	.37 (4.01)	.35 (3.57)
LogRecExp	.20 (2.49)	.03 (.50)	.18 (2.56)	.02 (.26)
1962RenExt	—	—	.08 (2.28)	.02 (..39)
1972Sound	—	—	.16 (3.80)	.03 (.48)
1976 Act	—	—	.07 (1.77)	−.14 (2.19)
1988Berne	—	—	.12 (2.86)	.11 (1.86)
1998BonoExt	—	—	.02 (.27)	.06 (1.06)
Constant	−13.8 (2.43)	−24.1 (5.11)	−.92 (.19)	−24.3 (3.47)
Durbin-Watson	.50	2.25	.87	2.11
rho	—	.84	—	.88
R^2	.97	.72	.98	.66
No. observations	90	89	90	89

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[61] An offset, however, is that registration for Berne Convention and WTO works is no longer a prerequisite to being able to sue for copyright infringement, though registration is still required for certain remedies.

One puzzling result is that the 1976 Act seems, after correction for other factors, to have reduced the number of copyright registrations by about 14 percent. Since the Act eliminated common law copyright and brought unpublished works under the federal statute, one would have expected the number of registrations to increase. The negative coefficient on the 1976 Act is the consequence of a sharp drop in registrations in 1978 (the year the Act took effect)—from more than 420,000 in 1977 to 310,742 in 1978, followed, however, by an increase to more than 400,000 the following year. If equation (1.4) is re-estimated treating fiscal year 1979 rather than fiscal year 1978 as the first full year of the 1976 Act, the coefficient on the *1976 Act* variable becomes positive and highly significant (.16 with a t-statistic of 3.08), indicating a 16 percent increase in registrations as a result of the Act. There are no changes in the effect of the other variables when we date fiscal year 1979 as the first year of the 1976 Act.

In Table 2 the dependent variable is the log of the number of renewals per year. Equation (2.1) presents OLS estimates and equation (2.2) Cochrane-Orcutt estimates. Since renewals depend in part on the number of works registered 28 years earlier, we include two registration variables—one for annual registrations from 1882–1910 and the other for annual registrations from 1911–1972—to account for the fact that data on registrations included both new registrations and renewal registrations through (most of fiscal year) 1910. We do not include variables for the 1972, 1976, 1988, and 1998 statutory amendments, as we would not expect them to affect renewals, holding registrations constant. For example, adding 20 years to the renewal term in 1998 increased the expected value (though only slightly) of a renewal but did not affect the incentive to renew because beginning in 1992 renewals had become automatic.

TABLE 2
REGRESSION ANALYSIS OF RENEWALS
(T-STATISTICS IN PARENTHESES)

Independent Variables	Log Renewals	
	OLS (2.1)	COREG (2.2)
Year	.018 (2.56)	.023 (2.61)
LogFee	−.09 (1.08)	−.22 (2.13)
$LogReg_{t-28}$1882-1910	.95 (10.34)	.86 (5.18)
$LogReg_{t-28}$1911-1972	.99 (10.64)	.89 (5.38)
LogRecExp	−.02 (.14)	−.12 (.67)
1962RenExt	−.07 (.69)	−.06 (.48)
1992AutoRen	−.64 (6.37)	−.47 (3.82)
Constant	−36.4 (3.10)	−44.0 (2.99)
Durbin-Watson	1.08	2.12
rho	—	.55
R^2	.98	.90
No. Observations	90	89

Table 2 indicates that renewals are highly responsive to registrations 28 years earlier. Not only are both regression coefficients highly significant, but we cannot reject the hypothesis that the coefficients are both equal to one—that is, that for each 1 percent increase in registrations 28 years earlier, renewals increased by 1 percent. As expected, the automatic renewal amendment in 1992 is statistically significant and indicates that renewals fell by about 50 percent after the amendment. Extending the renewal term from 28 to 47 years beginning in 1962 had no significant effect on renewals, but this is not surprising. Consider the copyright holder who has to decide whether to renew his copyright after expiration of the initial term of 28 years. Since the expected additional commercial life of such works is likely to be shorter than 28 years, adding 19 years to the renewal period should not significantly influence the decision whether to renew.

Turning to the *Year* variable, we find a statistically significant increase in renewals of 2 percent per year (holding registrations eligible for renewal constant). This is consistent with a long-term growth in the demand for and hence in the value of expressive activities, since in response to that growth copyright holders would have a greater incentive to renew their copyrights. After adjusting for this upward trend, we do not find any significant effect of recreation expenditures on renewals.[62]

Like initial registrations, renewals are responsive to changes in fees. Although the coefficient on fees in not significant in equation (2.1), autocorrelation in the OLS estimate produces standard errors that are not unbiased. Equation (2.2) corrects for this bias and reveals a statistically significant effect of fees on renewals: a 10 percent increase in the inflation-adjusted renewal fee results in a 2.2 percent decrease in the number of renewals.[63]

F. Trademark Renewal Rates

Additional light is cast on our subject by considering renewal rates for trademarks. A trademark has no fixed expiration date, but maintaining a federally registered trademark (which like a registered copyright confers procedural advantages) requires the owner to file an affidavit during the sixth year after registration, and in every tenth year, stating that the trademark is still in use, and he must also file a renewal application every 10 years.[64] Prior to the Trademark Law Revision Act of 1988 (effective November 16, 1989), registrations and renewals remained in force for 20-year periods subject to the owner's having to file an affidavit of continued use every 10 years. Thus, the Act reduced both the registration and the renewal periods to 10 years. Since there is no limit on the number of times a trademark can be renewed, we have in trademark law a model for how a system of indefinite copyright renewals might operate.

Since trademarks can be renewed indefinitely, renewals in period *t* arise from (1) trademarks first registered in *t – 20* and (2) trademarks registered initially in *t – 40*, *t – 60*, and so on that had been continuously renewed (the last time in *t – 20*) and are still in force at time *t*.[65] Assuming a constant rate of depreciation for trademarks in the interval *t – 20* to *t*, we have the following

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[62] This result is expected since there is a .87 correlation between the logarithm of recreation expenditures and *Year.*

[63] The reason equations (2.1) and (2.2) do not include an independent variable for the expected life of a copyrighted work is that renewals are used to estimate depreciation and hence expected duration, so that adding the log of expected duration to the right-hand side of the regression equation would place the log of renewals for the same year on both sides of the equation.

[64] 15 U.S.C. § 1058.

[65] Since our renewal data run through the end of fiscal year 1999 (September 30, 1999), slightly less than a decade after the Trademark Law Revision Act went into effect, all renewals in our sample come from trademarks that had been in force for at least 20 years.

identity: $REN_t = (REG_{t-20} + REN_{t-20})e^{-\delta 20}$ where *REN* and *REG* denote renewals and registrations respectively, *t* denotes time, and δ the depreciation rate.

Figures 10 and 11 plot renewal and depreciation rates for trademarks from 1934 to 1999, the period for which we have data. Trademark renewals averaged 27 percent, annual depreciation was 6.6 percent, and the expected life (equal to the reciprocal of depreciation) was 15.4 years. Trademark renewal rates and the average effective life of a trademark are greater and depreciation lower than the corresponding data for copyrights (see Figures 4 and 5). For an exact comparison, between 1934 and 1991[66] trademark renewals averaged 28 percent, depreciation was 6.4 percent, and the expected life was 15.7 years, while the corresponding figures for copyright renewals were 14 percent, 7.3 percent, and 14 years. Notice that although trademark renewal rates are double copyright renewal rates, the difference in depreciation and in life expectancy is less than 15 percent. The reason is that during that era trademarks were renewed after 20 years but copyrights after 28 years. So we would observe substantially higher renewal rates for trademarks than for copyrights even if depreciation were the same.

FIGURE 10
THE RATIO OF TRADEMARK RENEWALS IN T TO REGISTRATIONS RENEWALS IN T – 20: 1934–1999

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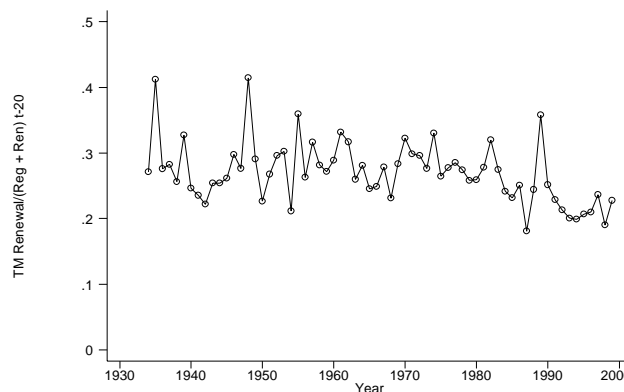
[66] We use these dates because 1934 is the earliest year for which we are able to calculate trademark renewal rates (which requires that we have renewals from 1914) and 1991 is the last year for accurately estimating copyright renewals because renewals became automatic starting in 1992.

FIGURE 11
DEPRECIATION IN T OF TRADEMARK REGISTRATIONS AND
RENEWALS IN T – 20: 1934–1999
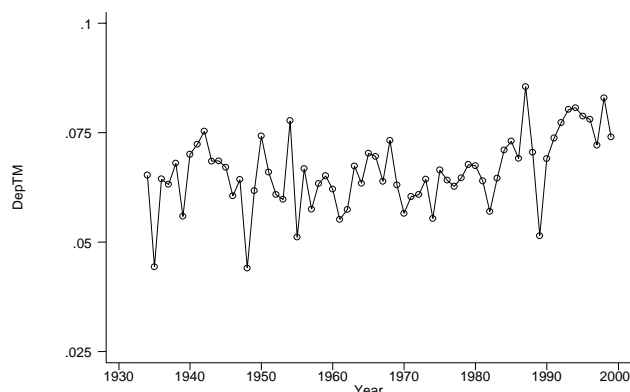
We also regressed (in logs) trademark renewals in *t* on registrations and renewals in *t – 20*, a time trend (*Year*), renewal fees adjusted for the CPI and GNP (*LGNP*) in logs for the period 1935 to 1999. Both registrations and renewals in *t* – 20 have positive and highly significant effects on renewals in *t*; renewal fees have a negative though only marginally significant effect (*t* = 1.74); and neither time nor GNP is significant.[67] It is not surprising that the estimated renewal elasticity with respect to fees is relatively small (–.06) and only marginally significant, because there has been very little variation in (nominal) registration fees over the past 50 year. Renewal fees were $15 from 1935 to 1945, $25 from 1946 to 1981, were increased sharply in the next two years (to $150 in 1982 and $300 in 1983), and have remained at $300 since then. There is some evidence that trademark renewal rates declined following the substantial fee increases in 1982 and 1983. Renewal rates averaged .27 in the five-year period 1977–1981 compared to .23 in the five-year period 1984–1988, when the fees were much higher.

The reason depreciation is lower for trademarks than for copyrights is similar to the reason depreciation of copyrighted music is lower than deprecia-

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[67] The regression equation is

$$LRen_t = -4.30 + .72 LReg_{t-20} + ..14\ LRen_{t-20} - .005\ Year + .06\ LFee_t$$
$$\quad\ (.66)\qquad\ (11.89)\qquad\ (6.05)\qquad\quad (1.02)\qquad\ (1.74)$$

$$-.40 LGNP + u$$
$$(1.45)$$

$$R^2 = .91\ \ \text{Durbin-Watson Statistic} = 1.80\quad n = 65$$

The analysis also supports the assumption that the depreciation rates on registrations and renewals in *t* – 20 are equal. Since the ratio of renewals to registrations average about .21 over the 1915–1979 period (the relevant time period for the dependent variable, which runs from 1935 to 1999), equal depreciation rates imply that the renewal elasticity in the above regression should be about 20 percent of the registration elasticity. This hypothesis is not rejected.

tion for books and graphic arts. Like music, a trademark attached to a particular product or service can be extended to new goods and services. A successful trademark embodies the good will and reputation of the producer. Firms have an incentive to capitalize on this good will by introducing new and improved products under the same brand name. The Ford Motor Company initially registered the "Ford" trademark in 1909 for automobiles and parts.[68] Since then Ford has introduced hundreds of new automobiles under the Ford name. Similarly, Bayer first registered its trademark in 1908 for use on synthetic coal-tar remedies, and later placed the name on numerous pharmaceutical products that did not exist in 1908.

This analysis suggests that the depreciation rate of trademarks is likely to be lower than that of books and graphic arts but not particularly likely to be lower than that of musical copyrights, which like trademarks have potential uses, for example in new recordings, beyond their first use. (Of course, some books do too—the novel *Gone With the Wind*, for example, later made into a very successful movie.) The data support this conjecture. We find, for the period 1934 to 1991, depreciation rates of 13.4 percent for graphic arts, 9.2 percent for books, 6.5 percent for trademarks, and 4.1 percent for music. These differences are all highly statistically significant.

Although trademarks can be renewed indefinitely, we find that their average economic life is only about 15 percent longer than that of the average copyright. The much higher renewal fees for trademarks may explain much of this difference. In 2000, it cost $300 to renew a trademark, compared to only $45 to renew a copyright.[69] However, another factor is that trademarks lapse unless used, and use is expensive, whereas a copyright can for example be renewed for a book that is out of print, the hope being that there will be some future interest in the book. Notice, finally, that the indefinite duration of trademarks is less problematic than would be the case for copyrights, because there are no social benefits to public domain trademarks, except of course generic ones—but trademarks fall into the public domain when they become generic (that is, become names standardly designating a class of products, such as "aspirin").

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[68] The Ford trademark was registered 14 years after its first use in commerce (1895).

[69] Patents have a kind of renewal component too. A patent cannot be renewed after the expiration of its 20-year statutory term; but even for it to remain in force for the full 20 years the patentee must pay maintenance fees of $880 at 3.5 years, $2020 at 7.5 years, and $3100 at 11.5 years after the patent has been issued. In effect, a patent holder gets to enjoy the full 20 year term only if he "renews" his patent three times. One study indicates that 82.6 percent of patents were still in force (i.e., had been "renewed") after 4 years, 57.4 percent after 8 years, and 37 percent after 12 years. Mark A. Lemley, "Rational Ignorance at the Patent Office," 95 *Northwestern University Law Review* 1495, 1508 (2001). We have estimated depreciation rates from these data of 4.8 percent over the first four years after issue, 6.9 percent from five to eight years, and 8.3 percent thereafter. Over the full 20-year period, the depreciation rate is about 6 percent. Put differently, we estimate an average economic life for a patent (given maintenance fees) of about 16.6 year, which includes a full 20-year term for about 30 percent of issued patents

V. CONCLUSION

The regression results in Tables 1 and 2 are evidence that copyright registration and renewals are indeed highly responsive to economic incentives, as our theory predicted. The shorter the expected life of a copyright and the higher the registration and renewal fees, the less likely are both registration and renewal. This in turn suggests that a system of modestly higher registration and renewal fees than at present, a relatively short initial term (20 years or so), and a right of indefinite renewal would cause a large number of copyrighted works to be returned to the public domain quite soon after they were created. Of course, those would tend to be works of low average commercial value; otherwise the owner would have renewed. And requiring registration and renewal for copyright protection, rather than, as at present, making these steps optional, would increase the incentive to take them. Nevertheless, a system of indefinite renewals (or one that combines renewals with a maximum duration) may enable society to have its cake and eat it too. More works will be in the public domain, thus minimizing access, transaction, and administrative costs, while those few copyrights that retain their value will remain in copyright protection indefinitely, with the economic advantages, involving investments in maintenance and the avoidance of congestion externalities, that we discussed earlier.

Granted, the more valuable works are also those that confer monopoly power and thus create deadweight loss if the duration of a copyright is extended. But we have given reasons for questioning whether deadweight loss is a serious consequence of extending copyright, at least if the system of indefinite renewals is available only for works created after the system is instituted. However, a benefit of indefinite renewal that should be especially emphasized, but that would be maximized by making the system available to existing copyrights as well, is that it would largely eliminate the rent-seeking problem that is created by the fact that copyright protection expires at a fixed date. Owners of valuable copyrights that are soon to expire will (along with enterprises that would like to appropriate the copyrightable works without charge) expend real resources on trying to persuade (dissuade) Congress to extend the term.

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