

An Unhurried View of Private Ordering in Information Transactions

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We stand at an unprecedented moment in the history of exclusive private rights in information (“EPRIs”).¹ Technology has made it possible, it seems, to eliminate to a large extent one aspect of what makes information a public good—its nonexcludability. A series of laws—most explicitly the Digital Millennium Copyright Act (“DMCA”) and the Uniform Computers Information Transactions Act (“UCITA”)—are building on new technologies for controlling individual uses of information goods to facilitate a perfect enclosure of the information environment.

The purpose of this Essay is to explain why economic justifications interposed in favor of this aspect of the enclosure movement are, by their own terms, undetermined. There is no *a priori* theoretical basis to claim that these laws would, on balance, increase the social welfare created by information production. The empirical work that could, in principle, predict the direction in which more perfect enclosure will move us has not yet been done. Empirical research that has been done on the effects of expanded EPRIs—in the

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1. I introduce here the term “EPRIs” to denote the panoply of rights we have been referring to in the last decade and a half as Intellectual Property Rights or IPRs. The term “property” is so heavily laden with an intellectual baggage created for normal economic goods that it often obscures more than it reveals about the collection of complex rules that our society has adopted to harness some market actors to provide what is essentially a public good—information. “Exclusive private rights in information” is functionally accurate and more analytically neutral.

context of patents—is quite agnostic as to the proposition that EPRIs are generally beneficial, except in very specific industries or markets.² We are, in other words, embracing this new legal framework for information production and exchange on faith. Given the tremendous non-economic losses—in terms of concentration and commercialization of information production and homogenization of the information produced³—that a perfectly enclosed information environment imposes on our democracy and our personal autonomy, such a leap of faith is socially irresponsible, and, as I have argued elsewhere at great length, probably unconstitutional.⁴

It used to be that the distribution technology of information goods was such that once they were uttered—say, a copy of a book was released—the owner could do little to prevent significant dissemination of the information by the holder of the medium of the utterance. One could lend the book to a friend, quote passages, or make photocopies, for example, without the owner being able, as a practical matter, to do anything about it. Information goods were,

2. See WESLEY M. COHEN ET AL., PROTECTING THEIR INTELLECTUAL ASSETS: APPROPRIABILITY CONDITIONS AND WHY U.S. MANUFACTURING FIRMS PATENT (OR NOT), (National Bureau of Econ. Research Working Paper No. 7552, 2000) available at <http://papers.nber.org/papers.html> (reporting on most comprehensive survey data currently available; finding that patents are the least important means of appropriating the benefits of innovation, relative to secrecy and lead time, and suggesting that much patenting in most industries (except pharmaceuticals and medical equipment) is intended defensively, against strategic use of patents by competitors, and not to appropriate the benefits of innovation); BRONWYN H. HALL & ROSE MARIE HAM, THE PATENT PARADOX REVISITED: DETERMINANTS OF PATENTING IN THE US SEMICONDUCTOR INDUSTRY, 1980-94, (National Bureau of Econ. Research Working Paper No. 7062, 1999), available at <http://papers.nber.org/papers.html> (reporting similar findings for the semiconductor industry specifically, noting the potential efficacy, nonetheless, of facilitating entry into niche product markets); ADAM B. JAFFE, THE U.S. PATENT SYSTEM IN TRANSITION: POLICY INNOVATION AND THE INNOVATION PROCESS, (National Bureau of Econ. Research Working Paper No. 7280, 1999), available at <http://papers.nber.org/papers.html> (surveying the empirical literature regarding the enhancement of patent in the past two decades, and finding that few robust conclusions could be drawn as to the effect of enhanced property rights on innovation).

3. I have described these effects in detail in Yochai Benkler, *Intellectual Property and the Organization of Information Production* (MS 1999), <http://www.law.nyu.edu/benkler/Ipec.pdf>.

4. See Yochai Benkler, *Constitutional Bounds of Database Protection: The Role of Judicial Review in the Creation and Definition of Private Rights in Information*, 15 BERKELEY TECH. L.J. 535 (2000) [hereinafter Benkler, *Constitutional Bounds*]; Yochai Benkler, *Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain*, 74 N.Y.U. L. REV. 354 (1999). My work follows that of many others. See JAMES BOYLE, SHAMANS, SOFTWARE AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY (1996); Keith Aoki, *(Intellectual) Property and Sovereignty: Notes Toward a Cultural Geography of Authorship*, 48 STAN. L. REV. 1293 (1996); Rosemary J. Coombe, *Objects of Property and Subjects of Politics: Intellectual Property Laws and Democratic Dialogue*, 69 TEX. L. REV. 1853 (1991); Niva Elkin-Koren, *Cyberlaw and Social Change: A Democratic Approach To Copyright Law In Cyberspace*, 14 CARDOZO ARTS & ENT. L.J. 215 (1996).

in this sense, partially nonexcludable—to some extent the owner could not exclude others from making valuable use of the work, and to that extent could not capture the social benefit created by the work. Goods that have this attribute are public goods in the limited sense that they will be underproduced if produced solely by private parties, because some of their social benefits are external to the producer.

Encryption technology makes it possible, at least in principle, for owners of information goods perfectly to control access to, and use of, their products. With the right legal background, say some, encryption could solve the public goods problem of information production. We could prohibit decryption of technical measures that control access to works, and enforce contracts made among private parties regarding the use of information goods. This would introduce a regime of private agreements regarding the price and terms of access to creative works, which would be more efficient than subjecting all information transactions to uniform background laws. The legal implementations of this optimism are the DMCA's anticircumvention and antidevice provisions, and the UCITA's enforcement of mass-market clickwrap licenses, including license terms that give vendors greater rights to control access to or use of the work licensed than general copyright law gives them.

There are three types of "economic" arguments in favor of the laws that support encryption and licensing as means of displacing background copyright law with private agreements. The first, which one might call the simplistic argument, is that if vendors can charge for all uses valuable to users, then users can use price signaling to signal vendors what information they value. Producers will respond by increasing production of what consumers are willing to pay for. The result is that the market will produce the type and quantity of information that consumers actually want, just as an ideal market produces any other economic good.

The simplistic argument in favor of encryption and licensing—to the extent it claims to be an economic argument—is wrong. Information is a true public good in the strict economic sense. It is not only nonexcludable, it is also nonrival. We say of a good that it is nonrival when its consumption by one person does not make it any less available for its consumption by another. Once such a good is produced, no more social resources need be invested in creating more of it to satisfy the next consumer. Apples are rival. If I eat this apple, you cannot eat it. If you nonetheless want to eat an apple, more resources need to be diverted from, say, building chairs, to growing apples, to satisfy you. The social cost of your consuming

the second apple is the cost of not using the resources needed to grow the second apple in their next best use—if you will, it is the cost to society of not having the additional chairs that could have been made from the apple tree. Information is nonrival. Once Tolstoy has written *War and Peace*, he need not spend any more time on it because fifty million people want to read it than he would to satisfy one reader.⁵ The degree to which a good is or is not rivalrous is a fact of nature—a thing either does, or does not have this unusual attribute that, once produced, many can enjoy it without added cost. Every good can be defined on a spectrum between a perfect economic good—which is rival and excludable, and a perfect public good—which is nonrival and nonexcludable. Information is generally understood to be perfectly nonrival and partially nonexcludable.⁶

The simplistic defense of encryption and contracts as better than background law fails because it assumes that by changing the partial nonexcludability to perfect excludability the public goods problem is solved. It is not. If a good is nonrival, then its marginal cost—the social cost of making it available for consumption by the next person—is zero. No private parties will produce that good for sale at its marginal cost, because “selling” the good at a price of zero will not allow them to recoup their costs. If, however, private parties do produce the good because they can exclude all consumers, and sell it only to those who value it at least at a price that covers investment in its production—a price that is above its marginal cost—then the good is being underutilized at the time it is being sold.

The simplistic defense is, then, “wrong” in the sense that we know that information is a true public good. If produced purely in response to positive (above zero) price signals, information will be produced only in response to consumers who value information at above its marginal cost. In the standard economic model, however, we know that a good is being produced and consumed efficiently only when it is sold at its marginal cost. It is simply inconsistent with the standard economic understanding of the economics of information production to say that “the best prescription for connecting authors to their audiences is to extend rights into every corner

5. Communication, on the other hand, is rival. Each book, the trees for pulp, the presses, the trucks, etc. are all rival and hence economic goods. But the “information” good or cultural product itself is nonrival.

6. See generally Paul Romer, *Endogenous Technological Change*, 98 J. POL. ECON. S71, S73-S74 (1990).

where consumers derive value from literary and artistic works . . . the results should be to promote political as well as cultural diversity, ensuring a plenitude of voices, all with the chance to be heard.”⁷

The other two defenses of encryption, licensing enforcement and generally stronger property rights are not “wrong” in this sense. They are possibly correct, under some circumstances. But those who offer these defenses overstate their theoretical determinacy by suggesting that private ordering is systematically preferable to public ordering—to wit, that contracts enforced by law and technology are better than copyright law. This is too strong a claim. It may sometimes be the case that private ordering will be preferable to public ordering, but when this will happen is a matter for empirical evaluation—empirical evaluation that no one has yet performed, and the results of which may be very different for different types of information goods. Moreover, the two defenses are theoretically in tension with each other—the “private parties have better information” defense described in the following paragraph assumes, albeit implicitly, no significant market power in the hands of vendors. The “price discrimination” defense that I will discuss thereafter, to the contrary, does assume the presence of market power, and relies on the efficiency associated with production by a monopolist that can perfectly price discriminate.⁸

The first of the two remaining defenses relies on the notion that private parties know better than government officials—legislative, judicial, or regulatory—what the correct level of protection is and what the correct level of access and use at a given price is. We know, goes the argument, about the public goods problem. We know that it must be solved by some level of use that is “free”, *i.e.*, at marginal cost, and some level of positively priced use. But no one knows for sure at a general level, for all transactions, what that level is. Private parties, goes this claim, are better situated than government officials to assess where that line should be drawn for their transaction—whether, for example, there should or should not be a right to make photocopies for nonprofit educational classroom

7. Paul Goldstein, *COPYRIGHT HIGHWAY: FROM GUTENBERG TO THE CELESTIAL JUKEBOX* 236 (1994). It is important to note here that I have focused on Goldstein’s statement not because I think he actually defends the simplistic argument, but because his clear statement of it can so easily be misread to support this argument, and it is very important to assure that it not be so misread. Goldstein’s actual argument is mostly of the second variety of argument that I describe in the following paragraphs of the text. *See id.* at 178-79.

8. *See* James Boyle, *Cruel, Mean or Lavish?: Economic Analysis, Price Discrimination and Digital Intellectual Property*, 53 *VAND. L. REV.* 2007 (2000).

uses of a given work, released under specific market conditions and assumptions. Sometimes it will be efficient to make such a use privileged to users at no cost, other times it will not. The parties, not the government, know which is which, and which use rights are more valuable in the hands of vendors or users. This type of defense has been made by, for example, Easterbrook in a recent essay,⁹ as well as more systematically by Merges.¹⁰

It is quite possible that in many cases private parties will have better information than public lawmakers about the correct extent to which they value a given use of a specific work. But remember that information goods, if they are sold at a positive price at all, are being sold at a price above their marginal cost. To the extent that we observe a transaction for an information good at a positive price, we are observing a situation where the seller has "market power" to engage at least to some extent in above marginal cost pricing.

Terms of use are part of the price. A vendor could price its product at \$10 plus the right to poke fun at the work, or at \$5 with an attached promise not to mock the work. Since we know that pricing is above marginal cost, and fixed at the profit-maximizing rate for the vendor (like monopoly pricing), we know that the price, whatever it is, will not reflect the socially optimal price, but rather the vendor's privately-optimal price given the elasticity of demand for its product to changes in the price/terms-of-use bundle at which it is offered.

In a market where above-marginal-cost-pricing is the rule, not the exception, the advantage private parties have in information over government actors is counterbalanced by our knowledge that the private parties will reach some suboptimal price, which could be partly expressed in access and use rights. The question then becomes empirical, not theoretical. One must compare the magnitude of the inefficiency introduced by the market power that EPRIs are designed to give vendors, to the magnitude of the ineffi-

9. See generally Frank H. Easterbrook, *Cyberspace vs. Property Law?* 4 TEX. REV. L. & POL. 103 (1999).

10. Robert P. Merges, *The End of Friction? Property Rights and Contract in the "Newtonian" World of On-Line Commerce*, 12 BERKELEY TECH. L.J. 115 (1997); see generally Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CAL. L. REV. 1293 (1996) (advocating use of collective rights organizations instead of compulsory licensing to foster expert tailoring of specific transactions and reduced political economy problems); Robert P. Merges, *Intellectual Property and the Costs of Commercial Exchange, A Review Essay*, 93 MICH. L. REV. 1570, 1605-13 (1995) (advocating creation of integrated contract law governing intellectual property-based transactions).

ciency introduced by the difference in information available to the government and to the parties to set terms of access. To the extent we have evidence that the difference in information that public and private actors possess is large, and the information good is sufficiently substitutable with similar information goods that there is little market power, private ordering may well outperform public ordering. But if the public/private information gap is not particularly large, and/or if the vendor has significant market power because the product does not have close substitutes, then public, not private ordering will be more efficient. The choice between the two is empirical, not theoretical, although one would tend to think that in mass market situations, where the contract is not negotiable, the comparison of quality of information is largely between the information available to the vendor alone—who drafts the contract—and the government. While the vendor knows its own interests better than the government, there is no reason to think that it similarly has an advantage over government with regard to information about the preferences or valuations of all potential consumers of its work. It must unilaterally determine the revenue-maximizing price, in terms of cash and usage, based on standard methods for predicting the preferences and behavior of large numbers of people—for example, a market study of consumer preferences. Similar judgments about preferences and behavior will, to a great extent, be the basis of public decisions regulating access rights. Mass market licenses—whose enforcement has been the most controversial aspect of UCITA—may therefore be the case where private ordering—licensing terms—would be least likely to improve on background rules that legislatures or courts might impose.

The final argument in favor of private ordering, or more perfect technological and contractual enclosure, relies on the assumption that information vendors have market power. It relies on the understanding that a monopolist who is permitted to, and practically can, perfectly price discriminate, will produce efficiently, unlike a monopolist who cannot so discriminate.¹¹ The crux of the defense, to whose questioning the remainder of this Essay is devoted, is that if introducing strong encryption protection and licensing enforcement allows vendors to price discriminate among consumers, then vendors will produce more efficiently than they will when it is impracticable for them so to discriminate.

11. See Boyle, *supra* note 8, at 2021-26.

The price discrimination argument was made quite plainly in Judge Easterbrook's opinion in *ProCD v. Zeidenberg*. There, the defendant had extracted raw data from the plaintiff's directory and used it to produce a new directory. Under the relevant Supreme Court precedent the defendant was privileged so to use the data. The directory was, however, distributed on a CD-ROM accompanied by a license that prohibited commercial re-use of the data. The question before the court, therefore, was whether to enforce the shrinkwrap license that was included with the CD. Prior law had largely refused to enforce such licenses, whether for contract law reasons concerning lack of consent, or for reasons of federal preemption of the state law enforcement of terms that give owners more rights than the explicitly limited rights granted them under federal copyright law.¹² Beyond the legal analysis, Judge Easterbrook justified his preference for enforcing the license on the following rationale:

The database is much more valuable to some users than to others. Manufacturers and retailers pay high prices to specialized information intermediaries for such mailing lists; ProCD offers a potentially cheaper alternative. People with nothing to sell could use the database as a substitute for calling long distance information . . . or just as an electronic substitute for the local phone book. ProCD decided to engage in price discrimination, selling its database to the general public for personal use at a low price (approximately \$150 for the set of five discs) while selling information to the trade for a higher price.

If ProCD had to recover all of its costs and make a profit by charging a single price—that is, if it could not charge more to commercial users than to the general public—it would have to raise the price substantially over \$150. The ensuing reduction in sales would harm consumers who value the information at, say, \$200. They get consumer surplus of \$50 under the current arrangement but would cease to buy if the price rose substantially To make price discrimination work, however, the seller must be able to control arbitrage Instead of tinkering with the product and letting users sort themselves—for example, furnishing current data at a high price that would be attractive only to commercial customers, and two-year-old data at a low price—ProCD turned to the institution of contract.¹³

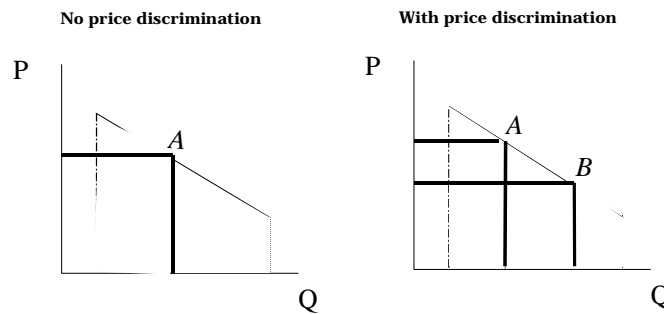
To see the limitations of this intuitively appealing analysis, it is necessary to introduce a more technical (though not substantively different) presentation of it.

Recall from the earlier discussion that the owners of EPRIs price their products above their marginal cost of zero. The pricing model that is most closely analogous to this kind of "value" pricing—pricing based on how consumers value the product, not on how

12. See Mark A. Lemley, *Intellectual Property and Shrinkwrap Licenses*, 85 S. CAL. L. REV. 1239, 1248-53 (1995).

13. *ProCD v. Zeidenberg*, 86 F.3d 1447, 1449 (7th Cir. 1996).

much producers pay to supply the marginal consumer—is monopoly pricing, where consumer valuation and elasticity of demand set the price and quantity at which the monopolist produces the good. The monopolist sets the price and quantity at the level that will maximize its profits, without regard to marginal cost. Consumers who value the good above that price gain consumer welfare. The producer gains the remainder of the social welfare generated by consumption of the good by those consumers who value the good at or above that price. The welfare that would have been gained by consumers in a competitive market—those who value the product above the marginal cost of providing it to them, but below the monopolists' revenue maximizing price—is lost to society. This loss is called “deadweight loss.” If, however, a monopolist can sell at one price to low value users and at a higher price to high value users, it will do so. This allows the monopolist to sell to more consumers who value the good at above its marginal cost, thereby reducing deadweight loss.



Social welfare (consumer plus producer surplus) represented by checkered area
 Deadweight loss represented by area shaded with diagonal lines
 A, B: price and quantity at which a product is offered.
 B represents the supply of an information good at a lower price than it would have been supplied in the absence of price discrimination. In Judge Easterbrook's explanation B marks the availability of the ProCD database at \$150 as opposed to only at a price in the thousands, which is represented by A in both graphs.

Figure 1: Social welfare benefits of price discrimination in monopoly markets

What is attractive about this story is that if you permit producers to appropriate every ounce of social welfare generated by their production efforts, they will produce at the socially efficient level, and deadweight loss will be eliminated. If one seeks to capture some of these social welfare increases for consumers, one can introduce various means of redistributing this newly created social

welfare from producers to society at large or to certain classes of deserving users. This is the crux of Fisher's influential discussion of price-discrimination in information transactions.¹⁴

There are many reasons, external to the model, to think that this story is less attractive than it might initially seem, mostly concerning the social value of information and its value as a productive resource.¹⁵ I will not address these types of concern in the space of this short Essay. Instead, I will explain why internally, accepting all the methodological assumptions of the model, price discrimination in the context of information goods cannot *a priori* be said to increase social welfare.

Implementing price discrimination is costly. The producer must invest in identifying discrete market categories that would bear different prices. It must also take measures—technical, contractual, marketing, or any combination—to prevent arbitrage of the good from low value users to high value users.

The total cost of implementing price discrimination for a given category of consumers determines the minimal granularity at which price discrimination can be implemented. Price discrimination, if you will, can never be perfect, but is always lumpy. The product is never sold to each and every consumer at his or her valuation, but is instead sold in categories the size of which is determined by the costs of identifying and implementing price discrimination for that group of consumers.

The lumpiness of price discrimination is especially important in information goods, because many users may value the goods at above their optimal demand price of zero, but below the minimal supply price, which is equal to the cost of implementing the price discrimination mechanism to serve them. At the very least this will equal the cost of identifying who really will not pay anything more

14. See generally William W. Fisher III, *Property and Contract on the Internet*, 73 CHI.-KENT L. REV. 1203 (1998).

15. See generally Julie E. Cohen, *Copyright and the Jurisprudence of Self-Help*, 13 BERKELEY TECH. L.J. 1089, 1101-27 (1998) (exploring the doctrinal foundations of proposed UCC Article 2B, and arguing that none of the common justifications for private ordering supports according information providers the broad powers of self-help that they claim as a matter of right); Julie E. Cohen, Lochner in Cyberspace: *The New Economic Orthodoxy of "Rights Management"*, 97 MICH. L. REV. 462, 515-59 (1998) (promoting shaping of information technology transactions more based on social welfare than on traditional common law contract and property rules); Niva Elkin-Koren, *Copyright Policy and the Limits of Freedom of Contract*, 12 BERKELEY TECH. & L.J. 93 (1997); Wendy Gordon, *Intellectual Property as Price Discrimination: Implications for Contract*, 73 CHI.-KENT L. REV. 1367 (1998) (a methodological, not normative, criticism of the price discrimination argument based on a restatement of intellectual property law generally as a publicly-constrained framework for price discrimination).

than their attention, and of preventing those individuals from arbitraging information they get at that price to users who value it more highly and would be willing to pay. Since the only consequence of developing such a category would be to enable the producer to give its product away for free to those people, and only to them, the producer is more likely simply to eliminate free distribution of its work rather than incur the cost that would allow it so to distribute the work.

The necessary lumpiness of price discrimination and the nonrivalry of information combine to alter the social welfare effects commonly associated with price discrimination by monopolists. It is easiest to grasp this difference if we separate out the social benefits generated by the aspects of the work that are sold or licensed for a price, and the social benefits of the aspects of the work that technology and law make available for privileged use, or in the public domain, once the work is created. Imagine, in other words, that the nonexcludable aspects of an information good are a beneficial by-product of information production, which itself is carried on solely in expectation of the benefits internalizable to the producer—sale of access to the excludable aspects.¹⁶ Now, this particular by-product is not entirely external to the product, because there is some substitutability between the excludable and nonexcludable aspects of a work.

For any given state of law and technology, there is a ratio of excludable to nonexcludable aspects of a work created, (e), such that as (e) approaches 1, the work is almost perfectly excludable, and vice versa. We can designate the supply of a work once created as $[I + I']$, where I represents the availability of the excludable aspects of the work, and I' represents the nonexcludable aspects of the work. For any given work, the quantity of I supplied and (e) for that work determines the quantity of I' generated as a by-product of the provision of I . Assume that I is provided solely in response to expectations of direct appropriation—appropriation based on exercise of the property rights that define the excludability of the good under a given state of technology.¹⁷ Producers fix the quantity of I

16. I have elsewhere explained why the assumption that information production is carried on by all producers for the same reason—to extract benefits directly in reliance on legal rights—is very partial, and that EPRIs are significantly less valuable, socially, than one predicts if one assumes that all producers in fact do rely on them to appropriate the benefits of their production. See Benkler, *supra* note 3.

17. This assumption gives EPRIs a stronger role as incentives for production than the empirical literature justifies. See *supra* text accompanying note 16. Relaxing this assumption would strengthen my claims here.

produced so as to sell it at a price that is their profit-maximizing rate, given (e) and the substitutability of excludable and nonexcludable aspects of the work.¹⁸

The social welfare generated by a work is the social welfare generated by the availability of $[I + I']$. In other words, since I' is a welfare-enhancing by-product of I , total social welfare generated by the production of I at any level includes the welfare effects of both the product and the by-product, even though the latter is a positive externality from the perspective of the producer.

Graphically, Figure 2 represents the tradeoff embodied in price discrimination when the welfare effects of the availability of the non-excludable aspects of the work is considered.

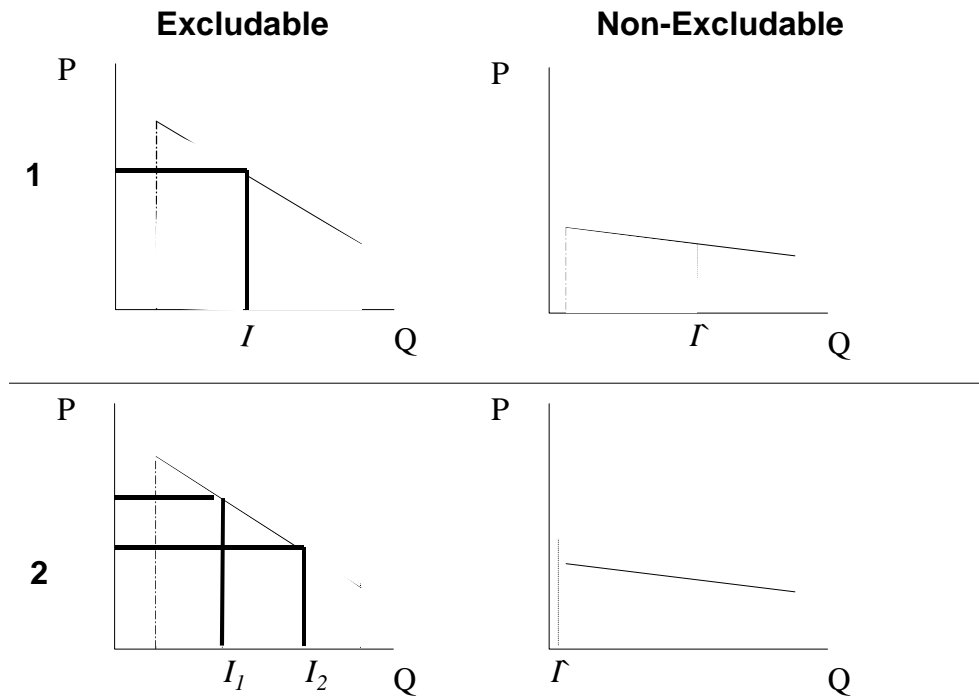


Figure 2: Welfare effects of price discrimination achieved by increasing excludability

18. In other words, since nonexcludable aspects of the work may for some users substitute for purchasing access to the work, the quantity of I to be produced also must take into account consumers lost to I' as a by-product of the production of I .

State 1, the top half of the figure, describes the sources of social welfare without price discrimination. Producers set the quantity of information they produce at I , based on the level that maximizes their revenues. Given a state of law and technology, I and e generate a given supply of I' . The social welfare generated by the producer is equal to the welfare generated by sale of the excludable aspects of the work (represented by the checkered area in the upper left hand quadrant of Figure 2) *plus* the social welfare generated by access to the nonexcludable aspects of the work for all those who value the work at less than its above-marginal-cost market price (represented by the checkered area in the upper right hand quadrant of Figure 2). The area shaded by diagonal lines in the upper left hand quadrant represents the social welfare loss—the deadweight loss—to all those who value access to the excludable portions of the work at more than its marginal cost, but less than its market-cleared price.

The bottom half of the figure represents the social welfare effects of enabling price discrimination by improving the excludability of information goods—through enforcement of contracts that limit use rights and by supporting encryption. In the bottom left-hand quadrant we see the effect argued in favor of laws that aid price discrimination. By enabling a producer to offer I in two distinct packages (say, for commercial and noncommercial use), at two distinct prices, each for a category produced at a certain quantity, call them I_1 and I_2 , the producer can eliminate some of the deadweight loss seen in the upper left-hand quadrant. However, as I explained in the text preceding the figures, price discrimination is not perfect. The producer will not incur the costs of permitting free access to uses that are nonexcludable under background law for consumers who value such access at or below the cost of their attention plus the cost of identifying them and preventing arbitrage from them to higher-valuing users.

The social gain created by increasing excludability of information goods so as to permit price discrimination is represented by the move from the upper to lower left-hand quadrant. The social loss caused by losing the social welfare effects of the availability of free access to the nonexcludable aspects of the work is represented by the move from the upper to lower right-hand quadrant. Whether the former outweighs the latter or *vice versa* is an empirical question that cannot be determined *a priori*.

To encapsulate the analysis, one might say that the social welfare gain created by price discrimination as to a given information good is generated by gains in the welfare of those who value

that information substantially above its marginal cost. This increase in social welfare is gained at the expense of the welfare lost by users who value the information between the value of their attention to it and that value plus an amount up to the vendor's cost of identifying that category of users and preventing arbitrage from them to higher value users, which is the lowest price at which the information will be supplied under near-perfect price discrimination. Given that information is a true public good, access by users of the latter variety is welfare enhancing, and its loss reduces social welfare. The social welfare lost from elimination of access to previously non-excludable aspects of information goods works may or may not outweigh the welfare gained from access to newly excludable aspects of the work at a lower price than previously available.

From a social policy perspective the most interesting reasons that might cause users not to be willing to pay enough to gain access to a more perfectly excluded information good are: (a) high uncertainty as to the value of any given piece of information; (b) high positive externalities of a user's having a given piece of information; or (c) hard budget constraints on paying for access to information that would typify users who use information for noncommercial reasons.

First, transformative users of the type whose use is most likely to be considered "fair" under background copyright law¹⁹ will often require access to many pieces of information each of which has a low probability of being the really useful information input in the transformative process. While the value of the transformative use might justify the time and effort spent in sifting through thousands of potential information inputs, perhaps even paying a small access fee to each of them, the willingness and ability to pay may be very low, depending on how remote the probability that any given piece of information, as opposed to the probability that some piece out of all these pieces will be a valuable input. The more transformative the reworking of an existing information input, the less useful the value of the input prior to the transformative reworking is as a predictor of its value as input. This adds to the valuation uncertainty for these kinds of uses.

19. See *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 579 (1994)

[T]he goal of copyright, to promote science and the arts, is generally furthered by the creation of transformative works. Such works thus lie at the heart of the fair use doctrine's guarantee of breathing space within the confines of copyright, and the more transformative the new work, the less will be the significance of other factors, like commercialism, that may weigh against a finding of fair use. (citation omitted).

Second, work that is functionally equivalent to basic scientific research—information production that has widespread basic effects in its area, be it scientific, cultural (say, experimental theatre), philosophical etc.—has very high social returns that cannot be captured by the producer.²⁰ High positive-externality productive users are likely to underutilize existing information if they must pay a price significantly above its marginal cost. They are therefore likely to be part of those who generate social welfare by accessing the nonexcludable aspects of the work, who would not be well-served by increased access to the excludable aspects of the work in exchange for loss of access to the nonexcludable aspects.

Third, producers who themselves produce for the public domain or otherwise for free distribution because they rely on means other than assertion of rights to appropriate the benefits of their production serve an important function of producing information without the systematic inefficiencies that attend commercial production for appropriation in reliance on EPRIs. Academics, non-profit organizations, government/public education institutions, librarians, etc., all provide important information production functions. To pay the original producer, and thereby share the social value they produce with it, these producers must themselves begin to charge a price for access to their products, thereby limiting the efficiency gains that these public providers of this public good—information—generate.²¹

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We are in the midst of a transformation in the way we regulate access to privately produced information. In the past we relied heavily on publicly created rules, copyright, patent, etc., to solve the problem of how to harness private enterprise to produce a public good—information—without losing too many of the social benefits generated by that public good. Driven by technological possibility and the political interests of those businesses that rely heavily

20. On the high positive externalities of basic science for commercial, as well as noncommercial purposes, see Ralph Gomory, *The Technology-Product Relationship: Early and Late Stages*, in *TECHNOLOGY AND THE WEALTH OF NATIONS* 383, 388 (Nathan Rosenberg et al. eds., 1992); Richard R. Nelson, *What is "Commercial" and What is "Public" About Technology, and What Should Be?* in *TECHNOLOGY AND THE WEALTH OF NATIONS* 57, 65-70 (Rosenberg et al. eds., 1992); Richard R. Nelson, *The Simple Economics of Basic Scientific Research*, 67 *J. POL. ECON.* 297, 306 (1959); KENNETH ARROW, *ECONOMIC WELFARE AND THE ALLOCATION OF RESOURCES IN THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* 609, 623-25 (National Bureau of Econ. Research, 1962); Rebecca S. Eisenberg, *Intellectual Property at the Public-Private Divide: The Case of Large-Scale cDNA Sequencing*, 3 *U. CHI. L. SCH. ROUNDTABLE* 557 (1996).

21. See Benkler, *supra* note 3.

on exclusive private rights in information, law has been moving towards increasing the excludability of information goods. In particular, we are moving towards law that supports the displacement of public determination of the scope and extent of exclusive private rights to information by private determination of that scope through a combination of technical control over the information and legal enforcement of contracts that must be signed as a condition of access to information so controlled. The most prominent expressions of this trend are the DMCA and UCITA.

There are three primary economic justifications for the move toward private ordering. The first, simplistic argument relies on the notion that if technology makes possible perfect exclusion from information products, then market signals will operate to secure efficient production of information. This argument is simply mistaken. It confuses the possible elimination of the partial nonexcludability of information goods with the elimination of the public goods problem of information. But information is a true public good. It is non-rival, as well as nonexcludable. A perfect private market will inefficiently produce a good—like information—that is truly a public good in the economic sense.

The second defense relies on the informational advantage that private parties have over government officials who set the background public rules regarding the allocation of control over access to and use of information. It argues that private parties have better information about what the most efficient allocation of price and access is, and that by enforcing strong property rights, encryption, and contracts, we will permit private parties to make such determinations for themselves. Property and contract here are seen as a procedure for achieving a solution to the public goods problem not because we think they can do so perfectly, but because they enable the parties with the better information about the correct solution to design the solution that seems best to them. This argument is not wrong. But it ignores the fact that all transactions for information goods negotiated on the background of EPRIs are negotiated in the presence of market power. Creating power to price above marginal cost is a necessary design feature of EPRIs. If EPRIs were designed in a manner that failed to give their owners some power to control price, they would fail, for the price of the information would be driven to its marginal cost of zero, and the incentive effect of EPRIs would be lost. In the presence of market power we have no systematic reason to think, *a priori*, that the terms of access negotiated will be socially optimal, any more than we have reason to think that the price of access will be socially optimal. Whether public or pri-

vate ordering is preferable in this context therefore depends on a comparison of the effect of the difference in information available for certain transactions to government officials as compared to private parties, and the effect of the market power on the deviation of privately negotiated rules from the socially optimal rules. This may be an empirically determinable question, but it is not determined as a matter of theory by noting that private parties have better information about their own interests than public officials. This argument is particularly ill-suited as a defense of enforcement of mass-market clickwrap licenses, where the terms of exchange are not negotiated, but instead are set by vendors who do not have systematically better information about user preferences than do lawmaking authorities.

Finally, the third defense relies on the idea that an information product vendor who has market power will more efficiently provide a good if it can price discriminate than if it cannot. Technical protection measures and contracts help vendors to price discriminate, therefore the social welfare losses created by EPRIs can be mitigated by introducing more efficient price discrimination. This defense, like the previous one, is not wrong, but it is not determinable as a matter of *a priori* theorizing. Because price discrimination is costly to introduce, it will of necessity be lumpy, not smooth. Introducing such imperfect price discrimination will require enhancing the excludability of information goods, and whether price discrimination increases overall social welfare will depend on whether the gains from enhanced consumer access to the excludable aspects of the work will outweigh the social losses caused by elimination or reduction in free access to the previously nonexcludable aspects of the work. There is no reason to think that price discrimination will always improve aggregate social welfare, or that it will do so in all sectors for all manner of means of exclusion. Sometimes it will, sometimes it will not, and telling which is which is a matter of empirical, not theoretical work.

There is, then, no general theoretical reason to think that private ordering of information transactions will systematically enhance aggregate social welfare, relative to public ordering of such transactions. There are, on the other hand, many reasons to think that increasing the excludability of information goods will impose significant costs on public discourse and on personal autonomy. Given these two facts about the state of our knowledge, it is impossible to determine whether the current trend towards making information more perfectly excludable is a rational public-regarding action. The actual perceived behavior of lawmakers is more likely a

function of the political economy of exclusive private rights in information.²² Increasing excludability enhances the welfare of owners of information goods, and these owners lobby for expanding rights. Those whose welfare is adversely affected are usually too diffuse to represent the full measure of the social loss, thereby presenting legislatures with a skewed picture of the social effects of perfecting the excludability of information goods. Perhaps, then, it is up to publicly spirited legislators, but even more so to judges, to serve as counterweight to these political imbalances, to review very carefully, and with a skeptical eye, proposals for further enclosure of the public domain.

22. I have described this political economy elsewhere. See Benkler, *Constitutional Bounds*, *supra* note 4.