"Fair Use" as Policy Instrument

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Introduction

Debate over the design of copyright is typically framed as a choice between providing more access to the public to created works and giving profits to those that created the works. To this observer of copyright policy discussions, granting any weight to the latter side of this tradeoff often seems to come grudgingly.[1] It is as if the purpose of rewarding creators (indirectly through owners, if the copyright is sold) is motivated solely by a sense that only a minimal degree of fairness justifies consideration of creators in the balance at all.

Intellectual property standards are under attack on at least four fronts. Seemingly innocuous or obvious business practices have been patented, leading to concerns that they

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[1] As one not a member of a law school faculty, I've casually observed the phenomenon that most law faculty are fond of the law in which they specialize, and wish it were broader and stronger. Antitrust professors love antitrust, First Amendment professors the First Amendment, and so on. The notable exception seems to be copyright—most copyright law professors I've heard seem to belief that copyright is overbroad, if not worthy of repeal altogether.

will be unnecessarily monopolized and promote collusion.[2] Cases involving mp3 music file sharing and DVD decoding cases suggest a conflict between listeners and producers regarding access to music and films, but also effects of copyright on broadband development.[3] The DVD cases reflect controversies regarding the Digital Millennium Copyright Act and its restrictions on access to decryption technology.[4] The Supreme Court has recently ruled against a claim that extending copyrights violates the Constitutional mandate "[t]o promote the Progress of Science and useful Arts by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[5]

This present work here is motivated by one facet of these controversies—whether viewing copyrighted works as special, e.g., as "cultural" goods, should change copyright doctrines, particularly to expand "fair use." Fair use is defined statutorily as the right to copy or use copyrighted works in ways that would otherwise lead to liability for infringement, based on four factors: purpose and character of the use, nature of the work, amount of it used, and effect on market or value.[6] The operational content of these factors continues to evolve in court.[7] Different policy goals, e.g., economic efficiency vs. maximizing access, might lead to tweaking of copyright standards or to more radical changes. We hope to illuminate the ways of adapting fair use to the pursuit of non-economic objectives and to understand when those adaptations might be more or less significant.

Markets for copyright involve too much detail possibilities to make precise recommendations regarding fair use, term limits, and breadth. In general, to examine how one

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[2] State Street Bank & Trust v. Signature Fin. Group, 149 F.3d 1368 (Fed. Cir. 1998); Amazon.com v. Barnes & Noble, 73 F. Supp. 2d 1228; Ciminello, Dominic P., "Business Process Patents—The Road to Reform," *The Internet Law Journal* (Nov. 14, 2000), available at http://www.tilj.com/content/iparticle11140001.htm.

[3] A&M Records, Inc., et. al. v. Napster, Inc. (9th Circ., Feb. 12, 2001), available at http://www.ca9.uscourts.gov/ca9/newopinions.nsf/69A4AA15F8D6CBD6882569F1005E7D93/$file/0016401.pdf.; Universal City Studios, et. al. v. Corley (2nd. Circ., Feb., 7, 2002), available at http://www.ca2.uscourts.gov:81/isysnative/RDpcT3BpbnNcT1BOXDAwLTkxODVfb3BuLnBkZg==/00-9185_opn.pdf#xml=http://10.213.23.111:81/isysquery/irl6291/1/hilite.

[4] Digital Millennium Copyright Act, Pub. L. No. 105-304, 112 Stat. 2860 (Oct. 28, 1998).

[5] Eldred et al. v. Ashcroft (U.S. Sup. Ct. 01-618, Jan. 15, 2003), available at http://www.supremecourtus.gov/opinions/02pdf/01-618.pdf, interpreting U.S. Constitution, Article I, Sec. 8.

[6] 17 U.S.C. § 107.

[7] In addition to the Napster case cited above, see Sony Corp. v. Universal City Studios, Inc., 464 U.S. 417 (1984); Harper and Row v. The Nation Enterprises, 471 U.S. 539 (1985); Campbell v. Acuff-Rose Music, Inc. 510 U.S. 569 (1994); American Geophysical Union v. Texaco, Inc., 60 F.3d 913 (1994);.

feature of copyright might usefully changed, it is useful to assume that the rest of copyright law is designed efficiently, to avoid using an inferior policy instrument to address a problem other than the one at hand.[8] Such narrowly structured, inherently unrealistic models may yet offer insight into how a change in objective may lead to a change in policy. Lacking more specific empirical justifications, copyright policy rules are likely to be relatively and appropriately simple, e.g., in not applying different fair use standards to a highly popular film compared to one with a small audience.

Prior analyses

Some economic analysis has been done of copyright using such simple approaches, but none have analyzed fair use when it may not function efficiently. Formal models of the design of copyright have focused primarily on the extent to which copying should be made or less costly. Novos and Waldman[9] found that stricter copyright could both promote both supply of higher quality works and reduce costs of "underutilization." This somewhat counterintuitive finding was based on a model in which everyone who wanted the copyrighted work obtained it, hence that the only costs of "underutilization" were when consumers obtained a lower quality version of the work through high cost private copying, rather than by paying the copyright owner's price. Johnson[10] uses a specific spatial model of differentiated copyrighted works to compare unrestricted copying to no copying. In his model, anything can happen, e.g., unrestricted copying can make both creators and consumers worse off in discouraging entry. Besen and Kirby[11] find a similar ambiguity with net losses in many cases, but find that copying can make both creators and consumers better off if private copies are less expensive to make than originals yet are reasonable substitutes.

More recently, Yoon offers a model with a decision by a single firm whether or not to produce the work, where copyright protection essentially increases private copying

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[8] T. Brennan, "An Economic Look at Taxing Home Audio Taping" *Journal of Broadcasting and Electronic Media* 32 (1988): 89-103.

[9] I. Novos and M. Waldman, "The Effects of Increased Copyright Protection: An Analytic Approach," *Journal of Political Economy* 92 (1984): 236-46.

[10] W. Johnson, "The Economics of Copying," *Journal of Political Economy* 93 (1985): 158-74.

[11] S. Besen and S. N. Kirby, "Private Copying, Appropriability, and Optimal Copying Royalties," *Journal of Law and Economics* 32 (1989): 255-80. A similar result where the buying group is a university acquiring journals for its faculty is found in S. Liebowitz, "Copying and Indirect Appropriability: Photocopying of Journals," *Journal of Political Economy* 93 (1985): 945-57.

cost.[12] If the work is already produced, one might want to restrict copying if private copying costs exceed the costs to the producer of making more copies. The optimal policy to deal with this "underutilization" could also be to place no restrictions on copying. If so, however, one might need some restrictions to ensure that the copyright holder earned enough profit to produce the work.

Analyses of fair use, on the other hand, typically attempt to explain why non-infringing uses of a certain sort should be allowed, rather than to look at the effects of fair use on the market itself. In particular, fair use should apply when market failures impede otherwise desirable uses that would impose minimal lost profits on copyright holders. The basis for this insight, from Gordon, is that the cost of transactions associated with some uses may exceed consumers' willingness to pay for those uses.[13] Brennan takes a similar but perhaps more narrowly economic approach, treating fair use as a compulsory license where the fee is zero.[14] His analysis builds on the "Coase theorem" analysis of Besen, Manning, and Mitchell.[15]

Arguing from this standpoint, Klein, Lerner, and Murphy claim that a test of a use being fair would be that the copyright holder *not* object to it, since its profits would be unaffected.[16] As noted above, one factor courts consider in determining if a use is fair is that it not substantially reduce the returns to the copyright holder. An important limitation of Klein, *et. al.*'s insight, however, is that it ignores the other three factors associated with fair use that courts could also consider. Copyright holders and user groups could dispute whether the nature and use of the work in news or educational settings justify unauthorized copying, even if there is a non-negligible effect on the work's market value.

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[12] K. Yoon, "The Optimal Level of Copyright Protection," *Information Economics and Policy* 14 (2002): 327-48.

[13] W. Gordon, " Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and its Predecessors," *Columbia Law Review* 82 (1982) 1600-57. See also W. Landes and R. Posner, "An Economic Analysis of Copyright Law," *Journal of Legal Studies* 18 (1989): 325-63. National Research Council Computer Science and Telecommunications Board (CSTB), *The Digital Dilemma: Intellectual Property in the Information Age* (Washington: National Academies Press: 2000): 138.

[14] T. Brennan, "Harper & Row v. The Nation: Copyrightability and Fair Use," *Journal of the Copyright Society of the U.S.A.*, vol. 33, no. 4 (1986): 368-89.

[15] S. Besen, W. Manning, and W. Mitchell, "Copyright Liability for Cable Television: Compulsory Licensing and the Coase Theorem," *Journal of Law and Economics* 21 (1978): 67-95.

[16] B. Klein, A. Lerner, and K. Murphy, "The Economics of Copyright: 'Fair Use' in a Networked World," *American Economic Review Papers and Proceedings* 92 (2002): 205-08.

Some analyses have taken a more strategic approach. Depoorter and Parisi suggest a different economic rationale for fair use, to limit incentives for strategic withholding when copyrighted works are complements.[17] In essence, each copyright holder has an incentive to hold out for the full value of a package of copyrighted works absent some compulsion to make the work available.[18] In an article not specifically on fair use, Takeyama offers a model in which fair use available to those with low reservation prices could allow a copyright holder to credibly commit to charge high prices in a multiperiod setting.[19] Absent fair use, the copyright holder could not commit not to offer a low price in later periods to low reservation price users, reducing the amount it could extract from users with high reservation prices.

A noteworthy implication of arguments based on transaction costs is that if those costs fall, the rationale for fair use defenses against accusations of infringement also falls. As the movement of creative works becomes increasingly digitized through the Internet, it becomes increasingly feasible for copyright holders to find and charge for uses that otherwise might have not been worth identifying in the analog environment.[20] Advocates of fair use view such developments as reducing free access to works below what users have come to expect, e.g., in educational and research settings.[21] These discussions only highlight the view that there may be more than economic efficiency in the design of fair use. The National Research Council's Computer Science and Telecommunications Board has observed that fair use might be justified by "fundamental human rights" associated with freedom of expressions and the press, and "public interest grounds" associated with education, library archives, and legal proceedings.[22]

[17] B. Depooter and F. Parisi, "Fair Use and Copyright Protection: A Price Theory Explanation," *International Review of Law and Economics* 21 (2002): 452-73.

[18] Their discussion does not necessarily suggest that the optimal fee for this compulsory license should be zero; they offer it only as a possible rationale for fair use.

[19] L. Takemaya, "The Intertemporal Consequences of Unauthorized Reproduction of Intellectual Property," *Journal of Law and Economics* 40 (1997): 511-22.

[20] CSTB, n. 13 *supra* at 136.

[21] National Council for Higher Education, "Of Fair Use, Liabilities, and Electronic Toll Booths," available at http://www.nea.org/he/nche/fairuse.html, accessed Apr. 26, 2003.

[22] CSTB, n. 13 *supra* at 137-38.

The economic models

Our purpose here is to expand the analysis of fair use in two related dimensions. First, fair use need not be perfect; there may be "leakage" in that some uses, for which users could pay and could be identified, may nonetheless be able to use the work for free as fair use is implemented as a practical matter. For example, I might be willing to pay a nontrivial amount for a copy of a CD to carry in my car, but as a practical matter, I do not need to do so. Conditioning fair use perfectly in terms of covering otherwise unprofitable uses, as suggested by Klein *et. al*. may not be forthcoming. Second, as alluded to above fair use may be based on objectives other than aggregate economic efficiency or wealth maximization. Copyright policy may want to disregard profits to copyright holders, recognize only gross consumer surplus, or count uses of copyrighted works without regard to the particular willingness to pay by a specific consumer for that specific use.

To gains some insight how the design of fair use rules might be set to maximize efficiency and then amended to reflect different policy objectives, we look at copyrighted works as a succession of "monopolies." Each has separate, independent demands, created at a fixed cost independent of actual use. We assume that works can be ranked in terms of value, i.e., that as more works are supplied, the "marginal" work is valued less (has a lower demand curve) then the previous one. These settings abstract away from the complications and arbitrariness inherent in differentiated product models. As the point of the models is to suggest qualitative policy directions rather than to estimate quantitative fair use standards, this abstraction may not be unduly costly. We treat "fair use" parametrically in two ways: varying the fraction k of uses available for free at any value, and varying a reservation price ceiling r below which uses can be obtained for free. We refer to the first as the "equal leakage" case, and the second as the "reservation price" case.

Fair use policy in either setting can involve a tradeoff between the number of works supplied and the number of uses of each work. This can counter the widespread belief that copyright is only a tradeoff between creators and consumers. Specifically, expanding fair use could reduce the number of markets served by copyrighted works. Expansion could thus be more costly on both efficiency-based and non-economic policy standards. Raising the ceiling may have no effect on incentives to create the copyrighted work, but it may also reduce highly valued uses—a crucial tradeoff in moving away from an efficiency-based fair use standard. In all of these cases, we can see how this parameter should be adjusted to address the breath of policy goals that might be considered, to see which direction fair use might be adjusted and the conditions under which substantial adjustments are more likely to be warranted.

The "equal leakage" setting

We begin with a set of actual or potential copyrighted works, indexed by the parameter n. As n increases, the demand $D(p, n)$ from consumers for that work at price p declines, i.e., $D_n < 0$.[23] This "non-crossing demand" assumption is required to make the analysis tractable for determining how different fair-use policies affect number of creative works supplied in equilibrium. For analytical convenience, we assume that each of these works can be created at a fixed cost c, constant across all n,[24] with no marginal cost for individual uses.[25]

Recognizing the simplification that demand for each copyrighted work is independent from the demand for any other, an owner of a copyrighted work n would set price p to maximize profit $\Pi(p, n)$

$$\Pi(p, n) = pD(p, n), \tag{1}$$

where

$$pD_p(p, n) + D(p, n) = 0.^{26} \tag{2}$$

Let $p^*(n)$ be the profit-maximizing price for work n as defined by (2), and let $\Pi^*(n) = \Pi(p^*(n), n)$ be the maximum profit received by the copyright holder for work n.[27] From equations (1) and (2), and the envelope theorem,

[23] We naturally assume $D_p < 0$ and other second-order conditions necessary to ensure unique internal profit maximizing prices for each produced work.

[24] Another important simplification is that copyrighted works are not complements, in the sense of that the cost of producing one work falls if other works are available as instructive examples, subjects for parody, or in other relevant ways. Such considerations underlie concerns with parody and derivative works in the copyright area, and innovations that build on earlier ones in the patent area.

[25] Alternatively, one could regard the demand curve for work n as net of the marginal cost of producing copies.

[26] We assume for convenience that copyright holders cannot price discriminate, at least beyond the price discrimination that fair use policies institute.

[27] Profit here refers to variable profit or producer surplus, ignoring the *ex ante* costs of producing the work. With zero costs of producing uses, profit as used here is synonymous with revenue. To rely on profit-maximization, we will refer to this as "profit" rather than revenue. The number of works determined endogenously with entry up to the point that this profit equals the cost of producing a work.

$$\Pi^{*\prime}(n) = [p^*(n)]D_n(p^*(n), n) < 0. \tag{3}$$

Profits fall with n because of our assumption that $D_n < 0$. The equilibrium number of works n^* supplied with no fair use will be the number where the profits just cover the cost of production, i.e., defined by $\Pi^*(n^*) = c$.

The fair use/number of works tradeoff

We first look at fair use as a policy intervention that by intent or effect allows some fraction of uses of copyrighted works to take place without having to pay the copyright owner. For simplicity's sake, we assume that this happens uniformly over the demand curve. Let $k \in [0, 1]$ be the fair use parameter, such that the amount of uses that the copyright owner of work n can sell at price p will be $[1 - k]D(p, n)$. The amount of free uses that take place will be $kD(0, n)$. An advantage of the assumption that k is uniform over the demand curve is that the price that maximizes profits will be determined by equation (2), independent of k. Hence, in this formulation the extent of fair use has no effect on prices of copyrighted works that are sold. The total amount of uses of work n with fair use k, $USE(n, k)$, is

$$USE(n, k) = [1 - k]D(p^*(n), n) + kD(0, n). \tag{4}$$

Fair use will determine the quantity of works that are supplied. At fair use intensity k, works will be created up to the point where profits of the marginal work N just cover creation costs, i.e.,

$$[1 - k]\Pi^*(N) = c. \tag{5}$$

This implicitly defines the number of works as a function of the fair use regime, $N(k)$. From (5) and (3), and the definition of profit, the derivative $N'(k)$ is given by

$$\begin{aligned} N'(k) &= \frac{\Pi^*(N)}{[1-k]\Pi^{*\prime}(N)} \\ &= \frac{c}{[1-k]^2[p^*(N)]D_n(p^*(N), N)} \\ &= \frac{D(p^*(N), N)}{[1-k]D_n(p^*(N), N)} < 0. \end{aligned} \tag{6}$$

The fraction is negative because demand is positive and the denominator is negative by assumption.[28] The magnitudes of N' and D_n are inversely related. If reducing the number of works just a little bit would have large increase in demand and profits of the marginal firm, N will only fall a small amount for a given increase in the degree of fair use. Equation (6) not only defines $N'(k)$ but provides the basis for the assumption in the derivations below that $N'(k) < 0$, i.e., that fair use reduces the number of works created.

Welfare from a given work

To see how fair use might be adjusted to meet different policy objectives, we model some potential candidates. Figure 1 indicates these useful alternatives for a particular work n; the key for any case will be to recognize tradeoffs. Increasing k may increase the contribution to the policy objective from work n against the reduction in the total number of works $N(k)$ that would be supplied.

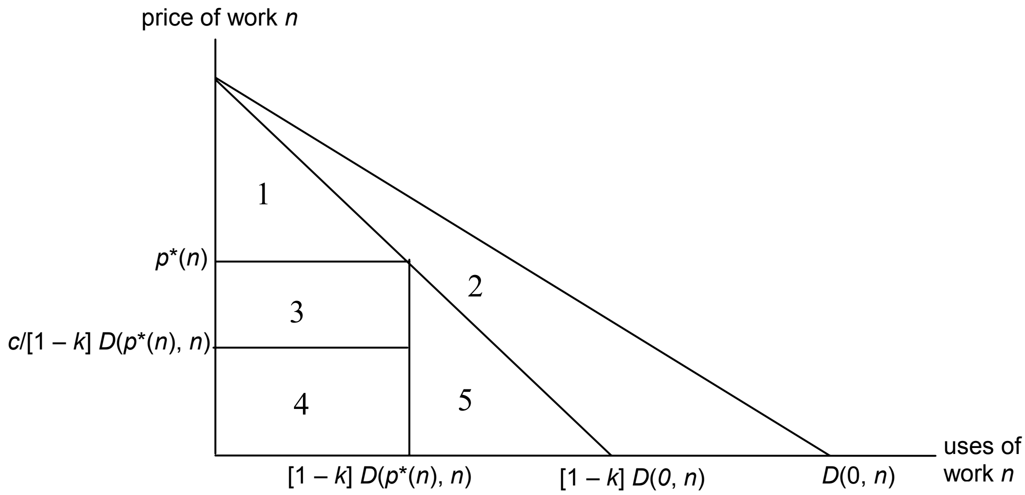

Figure 1: Consumer surplus, profits, costs for work *n*: "equal leakage"

In Figure 1, Area 1 corresponds to the consumer surplus of those who pay $p^*(n)$ to use work n. Area 2 is the consumer surplus from the $kD(0, n)$ fair uses. Area 3 is the profit to the creator of work n. Area 4 is the cost c of producing work n. Finally Area 5 is the foregone potential surplus from those unable to obtain a fair use of work n and unwilling

[28] The result that $N' < 0$ is more general. Define $\prod(n, k)$ as the operating profit of the n^{th} work given fair use intensity k. Let $c(n)$ be the creation cost of the n^{th} work. N, the total number of works created, will thus be defined by $\prod(N, k) = c(N)$. N' is $\prod_k/[c' - \prod_n]$. We would expect the numerator to be negative (fair use reduces profits) and the denominator to be positive (net profits fall as more works are created). If so, the number of works falls as fair use becomes more generous.

to pay $p^*(n)$ for it. Were the supply of work n guaranteed, we would want to set $k = 1$, setting Area 2 to the entire consumer surplus and with Area 5 disappearing. We can now look at setting k to maximize different social objectives.

Number of works

Let k_N be the level of k set to maximize the number of works N, e.g., to encourage creativity without regard to other objectives. Under this policy, we should set $k_N = 0$, i.e., have no fair use, since $N' < 0$.

Net economic welfare

From Figure 1, the contribution to net economic welfare from work n with fair use k is the sum of Areas 1, 2, and 3. It will be helpful to reduce some of the clutter in the notation to define the consumer surplus function $CS(p, n)$ of work n at price p as

$$CS(p, n) = \int_p^\infty D(p,n)dp .$$

Area 1 is $[1 - k]\ CS(p^*(n), n)$; Area 2 is $kCS(0, n)$. Aggregated over all $N(k)$ works supplied, net economic welfare $NEW(k)$ is

$$NEW(k) = \int_0^{N(k)} \left[[1-k]CS(p^*(n),n) + kCS(0,n) + p^*(n)[1-k]D(p^*(n),n)\right]dn \ - cN(k).$$

Recalling from equation (5) that the profits of the marginal work just cover its creation costs, the degree of fair use k_{NEW} maximizing NEW is that which satisfies the first-order condition

$$\frac{d(NEW)}{dk} = \int_0^{N(k)} \left[CS(0,n) - CS(p^*(n),n) - p^*(n)D(p^*(n),n)\right]dn$$
$$+ N'[[1-k]\ CS(N, p^*(N) + kCS(N, 0)] = 0 \qquad (7)$$

The integral in the first-order condition is the increase in net economic welfare from each work supplied with more fair use. This is the sum of the net gains to consumers from getting more free uses, less the lost profits to creators. The second term is the lost economic welfare from the works not produced as fair use is expanded. Because profits from the marginal works produced are zero, losses from reduced output are borne entirely by consumers.

Aggregate consumer surplus

A third potential standard for fair use policy would be to consider costs but to leave profits to creators out of the social benefit calculation. In figure 1, this would be to focus only on Areas 1 and 2, leaving out Area 3, profits to creators. If we let $ACS(k)$ refer to this measure, we have

$$ACS(k) = NEW(k) - \left[\int_0^{N(k)} p^*(n)[1-k]D(p^*(n),n)dn - cN(k) \right]$$

Recalling that the profits from the marginal work just cover creation cost,

$$\frac{d(ACS)}{dk} = \frac{d(NEW)}{dk} + \int_0^{N(k)} p^*(n)D(p^*(n),n)dn \,. \tag{8}$$

The term on the right in equation (8) is the effect of increased fair use on profits to inframarginal works. This was subtracted out in calculating net economic welfare. At k_{NEW}, where NEW is maximized, ACS will thus be increasing in k.

Accordingly and not surprisingly, the level of fair use that maximizes consumer surplus, k_{ACS}, will be greater than k_{NEW}. The lost profits to copyright work holders would not matter. The difference between k_{ACS} and k_{NEW}, i.e., the degree to which fair use should be increased if we focus solely on benefits to users, depends on the magnitude of the integral in equation (8). This is larger the greater are prices at which copyrighted works are sold. If consumer surplus is the criterion for setting fair use, fair use should be stronger the higher are prices for copyrighted works. In setting a stronger fair use policy, however, fewer works would be supplied.

Gross benefit

A fourth potential basis for fair use policy might be to look only at the value of the uses to consumers of the works, neglecting both profits and costs except to the degree that they influence the number of works available. This would conform to the sums of Areas 1, 2, 3, and 4 in Figure 1, not subtracting production costs from the benefit calculus. If we let $GB(k)$ be this gross benefit, it is defined by adding back costs into the expression for net economic welfare, i.e.,

$$GB(k) = NEW(k) + cN(k).$$

Hence that

$$\frac{d(GB)}{dk} = \frac{d(NEW)}{dk} + cN'(k). \tag{9}$$

The first-order condition for gross benefit is given by equation (7) for NEW, adding back cN' (= $[[1-k]p^*(N)(D(p^*(N), N)]N'$, which is negative. At k_{NEW}, the level of fair use that maximizes net economic welfare, $d(GB)/dk < 0$, implying that the level of fair use that maximizes gross benefits, k_{GB}, is less than k_{NEW}.

This is less surprising than it may initially appear. If production costs do not matter, the optimal number of works should increase relative to that under a net welfare standard. The difference depends on N'. If increasing the degree of fair use has little effect on output, the fair use policy that maximizes net economic welfare will be close to the policy that maximizes gross benefit from created works.

Numbers of users

Fifth and last, suppose that the object of fair use policy should be to maximize the number of uses of copyrighted works, without regard to the value of particular uses. Such a position would follow from a belief that willingness to pay by a particular person to use a particular work depends more on wealth and does not speak to the intrinsic social value of access to works. Letting USE reflect the volume of access to copyrighted works under fair use regime k, we have

$$USE(k) = \int_0^{N(k)} \{[1-k]D(p^*(n), n) + kD(0, n)\} dn$$

and

$$\frac{d(USE)}{dk} = \int_0^{N(k)} \{D(0, n) - D(p^*(n), n)\} dn + N'[[1-k]D(p^*(N), N) + kD(0, n)]. \tag{10}$$

The integral term in equation (10) is the net increase in uses of existing works from extending fair use. The second term is the lost uses that follow when extending fair use leads to a reduction in the number of works viewed.

No general comparison between k_{USE}, the degree of fair use that maximizes access, and the other values of fair use found above is apparent. Equation (10), however, suggests one possibility. It is similar to the expression for the first-order condition for maximizing consumer surplus. From equations (7) and (8), we have

$$\frac{d(ACS)}{dk} = \int_0^{N(k)} [CS(0,n) - CS(p^*(n),n)]dn + N'[[1-k]CS(N, p^*(N) + kCS(N, 0)]$$

The integral term on this expression may be thought of as equal to the integral term in equation (10) times the average consumer surplus over the supplied works. The second term is the above expression may be thought of as equal to the second term in equation (10) times the average consumer surplus of the marginal work. If so, the positive contribution to the condition for *CS* outweighs the negative contribution at k_{USE}, suggesting that

$$\frac{d(ACS)}{dk} > 0 \text{ at } k = k_{USE},$$

hence that $k_{ACS} > k_{USE}$.

This result is plausible. Increasing the amount of fair use will tend to increase uses of inframarginal works that are relatively highly valuable, and discourage creation of works that are valued less. If these relative values are ignored and all uses counted equally, this difference will not matter, and this justification for making fair use stronger will not apply.

Summary

We can put all of this together as follows: Recalling that the optimal fair use regimes are k_N for number of works, k_{NEW} for net economic welfare, k_{CS} for consumer surplus, k_{GB} for gross value of uses, and k_{USE} for number of uses, we have

$$k_{ACS} > k_{NEW} > k_{GB} > k_N = 0 \text{ and, probably, } k_{ACS} > k_{USE}.$$

The degree of the first inequality depends on the prices at which copyrighted works are sold. The degree of the second and third inequalities depends on the sensitivity of the supply of copyrighted works to price. My guess is that one could come up with specifications for this model in which $k_{NEW} > k_{USE}$, i.e., if one were concerned only with uses, one might want a *weaker* fair use policy than that motivated by economic efficiency.

Low reservation price fair uses

We now turn to a model in which copyrighted works are created as before, but where fair use more closely corresponds to the transaction costs rationales Gordon and others have described. Fair use may be characterized by a parameter r, where all uses of the work valued at a reservation price below r are free to the user. We assume throughout this section, without explicit justification, that this restriction is enforceable, i.e., that there is no leakage of users with higher willingness to pay into the fair use regime.

Obtaining results on the design of fair use policies in this setting requires the further assumption that as n increases, $p^*(n)$ falls, i.e., $p^{*\prime} < 0$.[29] As defined above, n^* is the copyrighted work for which profits just cover cost, i.e., where $p^*(n^*) = c/D(p^*(n^*), n^*)$. Under the assumption that $p^{*\prime} < 0$, fair use will not discourage any creation of works for $r \leq p^*(n^*)$. For all $n \leq n^*$, $p^*(n) \geq p^*(n^*) \geq r$, implying that the copyright holder will lose no sales. It will enhance all measures of benefit based on use, without reducing the supply of works, if the fair use policy is at least $p^*(n^*)$. For notational convenience, let r^* equal $p^*(n^*)$. For the rest of the analysis, we restrict our attention to $r \geq r^*$.

In this setting, there are two different effects of fair use on the market for a work, depending on whether $p^*(n) > r$ or $p^*(n) \leq r$. The former is case displayed in Figure 2.

[29] This assumption does not follow from $D_n < 0$. For any n, the value of p^* is defined by $\prod_p(p, n) = 0$. Consequently, $p^{*\prime} = -\bullet_{pn}/\bullet_{pp}$. Since the denominator is negative (the second order condition for profit maximization,) $p^{*\prime} < 0$ if and only if $\prod_{pn} < 0$. From equation (2), $\bullet_{pn} = pD_{pn} + D_n$. The second term is already assumed negative, but the first could be positive and outweigh that negative effect. A sufficient condition for $p^{*\prime} < 0$ is that $D_{pn} < 0$, i.e., that the slope of the demand curve becomes steeper at any price as n increases.

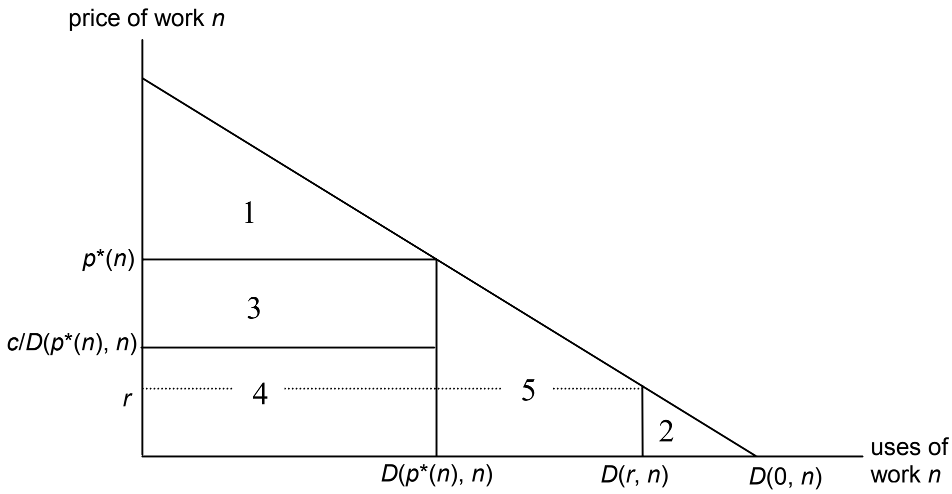

Figure 2: Consumer surplus, profits, costs for work *n*, profit-maximizing price > fair use price

As with Figure 1, Area 1 represents the consumer surplus for those who buy work *n* at the copyright holder's price $p^*(n)$, area 3 is the net profits reaped by the copyright holder of work *n*, and area 4 is the cost *c* of creating work *n*. With no "leakage", all of these independent of the fair use regime, as long as $p^*(n) > r$. Area 2 represents the consumer benefits from the fair use regime, which is the ability of those with reservation prices below *r* to obtain the works for free. Area 5 represents consumers unwilling to pay $p^*(n)$ but willing to pay more than *r*; these consumers do not get the work and reap no benefits. In this setting, under a reservation-price, transaction-cost based rationale for fair use, those who value the work a lot or a little get it; those in the middle do not. Note that *r* need not be below $c/D(p^*(n), n)$ as drawn in the graph, as long as it is below $p^*(n)$.

The second case is where $p^*(n) \leq r$. In that case, the copyright holder of work *n* is unable to charge the profit maximizing price, since users who value the work more than $p^*(n)$ but less than *r* will obtain it for free. With no leakage, the copyright holder's most profitable tactic will be to charge *r* for the $D(r, n)$ uses valued more than *r*. The relevant effects are displayed in Figure 3, for works created.

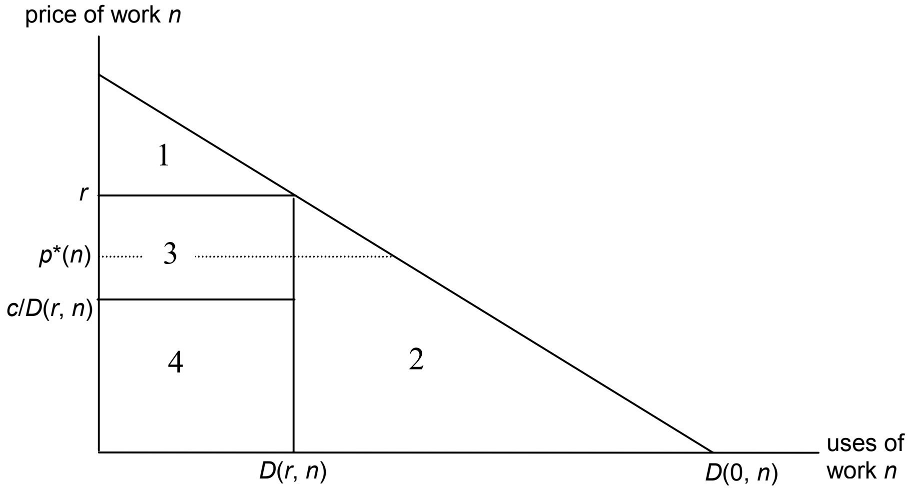

Figure 3: Consumer surplus, profits, costs for work *n*, profit-maximizing price ≤ fair use price

Consumers make all positively valued uses of works in this category. Area 1 represents the surplus of those consumers who have to pay r for the work. Area 2 is the surplus captured by consumers with reservation price less than r who get the freely under the fair use policy. Area 3 is the profit to the copyright holder; Area 4 is the cost of creating this work.

The fair use/output tradeoff; output-maximizing fair use

Works for which $rD(r, n) < c$ will not be created. Let $N(r)$ be the value of n for which $rD(r, n) = c$. From our assumption that equilibrium price increases as n falls, we have that all works for which $n < N(r)$ will be created. The degrees of fair use that maximize output, indicated with the subscript N as before, will be $r_N \leq r^*$. Since we would not want uses discouraged that would leave output and prices unaffected, we will set $r_N = r^*$. Moreover, since increasing uses without changing output or prices would be better by any policy criterion, the optimal r in each case will always be no less than r^*.

Net economic welfare

For any r, we can subdivide the range of copyrighted works $n \geq N(r)$ that are created into two categories. First, for $n \geq N(r)$ such that $p^*(n) < $ r, copyright holders will set the price at r and sell $D(r, n)$, as in Figure 3. Let $N^*(r)$ be defined by $p^*(N^*) = r$. Because $p^{*\prime} < 0$, $N'^* < 0$; as r increases, the set of works for which owners can charge the profit maximizing price will shrink. For $n > N^*(r)$, owners can charge $p^*(n)$, with results as seen in Figure 2.

The net economic welfare *NEW* defined by the fair use policy r is given by the consumer surplus plus profits aggregated over works in each of these two categories, less creation cost.

$$NEW(r) = \int_0^{N^*(r)} \left[CS(p^*(n), n) + CSF(r,n) + p^*(n)D(p^*(n),n)\right]dn + \int_{N^*(r)}^{N(r)} CS(0,n)dn - cN(r). \tag{11}$$

As before, $CS(p, n)$ is the consumer surplus for those who purchase at price p the right to use work n. $CSF(r, n)$, the consumer surplus from fair use, reaped by those with reservation prices below r who obtain work n for free, is Area 2 in Figure 2. For $n \in [0, N(r)]$, the terms in the integral are respectively Areas 1, 2, and Areas 3 and 4 together; Area 4 is subtracted off in the cost term on the left.

For $n \in [N(r), N^*(r)]$, all uses are made of the work, so the total benefit net of costs is just total available surplus $CS(0, n)$. The last term is the subtracted cost of creating $N(r)$ works. If $r = p^*(0)$, $N^*(r) = 0$. The consumer surplus of works created exceeds the creation cost c for $r > r^*$.[30] Increasing r above $p^*(0)$ would eliminate consumer surplus from the fewer works that are created, and those losses would be less than the saved costs. The value of r that maximizes *NEW*, r_{NEW}, must be at most equal to $p^*(0)$, $N^*(r_{NEW}) \geq 0$, and all terms of equation (11) will be relevant in the equilibrium. Accordingly, r_{NEW} is the value of r satisfying

$$\frac{d(NEW)}{dr} = \int_0^{N^*(r)} CSF_r(r,n)dn$$

$$+ N^{*\prime}(r)[CS(p^*(N^*(r),N^*(r)) + CFS(r,N^*(r)) + p^*(N^*(r))D(p(N^*(r),N^*(r)) - CS(0,N^*(r))]$$

$$+ N'(r)(CS(0, N(r)) - c.$$

[30] At r^*, where n^* works are produced, the profit of work n^* just equal costs. As consumer surplus exceeds profits, consumer surplus exceeds costs. If this is true at n^*, it will be true for all $n < n^*$, since profits increase as n falls.

Simple calculations show that $CSF_r(r, n) = -rD_r(r, n)$.[31] In addition, by definition, at $N^*(r)$, $p^* = r$. Hence, the sum of Areas 1, 2, and 3 constitutes the entire consumer surplus $CS(0, N^*(r))$ available at that price. The long second term on the right hand side is zero, leaving as the first-order condition

$$\frac{d(NEW)}{dr} = \int_0^{N^*(r)} -rD_r(r,n)dn + N'(r)CS(0, N(r)) - cN'(r). \qquad (12)$$

The first term is the increase in surplus from allowing more uses of works for which the selling price exceeds the fair use reservation price standard. The second term is the lost surplus from the marginal works that are no longer profitable to sell when all uses valued below r are provided free. The last term is the reduction in cost from creating N' fewer works.

We can modify this expression further to gain additional insights. Because D_r and N' are negative, it will be useful to use absolute values and change signs as appropriate. Let

$$\overline{D}(r, N) = \frac{\int_0^N [D(0,n) - D(r,n)]dn}{N}$$

be the average amount of fair use of works 0 through N at maximum reservation price r. We can rewrite equation (12) as

$$\frac{d(NEW)}{dr} = N^*(r)r\overline{D}_r(r, N^*(r)) - |N'(r)|[(CS(0, N(r)) - c]. \qquad (13)$$

The first term is, again, the gain in surplus from increasing fair use, which equals the average increase in consumer surplus times the number of works for which that surplus is increasing. The second term is the lost net surplus as the supply of works falls by $|N'(r)|$.

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[31] From Figure 2, $CSF(r, n) = CS(0, n) - CS(r, n) - rD(r, n)$. Taking the derivative of this expression with respect to r gives

$$CSF_r(r, n) = -CS_r(r, n) - D(r, n) - rD_r(r, n).$$

Since $CS_r(r, n) = -D(r, n)$, the first two terms on the right hand side of this equation cancel, leaving the expression in the text.

The subscript r refers to the partial derivative of demand with respect to price. For ease of exposition, we use r instead of p throughout this section.

Net economic welfare is maximized when equation (13) equals zero. Setting it equal to zero and multiplying through by $r/N^*(r)[(CS(0, N(r)) - c]$ gives the equivalent first-order condition

$$\frac{r\overline{D}(r, N^*(r))}{[CS(0, N(r)) - c]} \varepsilon_{USE} = \frac{N(r)}{N^*(r)} \varepsilon_N, \tag{14}$$

where

$$\varepsilon_{USE} = \frac{r}{\overline{D}(r, N^*(r))} |\overline{D}_r(r, N^*(r))|.$$

is the elasticity of the quantity of fair uses for works where the price is above the fair use reservation price, and

$$\varepsilon_N = \frac{r}{N(r)} |N'(r)|$$

is the absolute value of the elasticity of supply of works with respect to the degree of fair use.

The numerator in the fraction on the left hand side of the expression is the ratio of the product of the marginal value of fair uses times the average fair use of works where the market exceeds the reservation price of fair uses. The denominator is the total net surplus of works that would be excluded if fair use were marginally enhanced. The fraction on the left-hand side is the ratio of total works created to works created where price exceeds the marginal fair use.

Maximizing net economic welfare may entail no adjustments in fair use beyond r^*, where no fair use leads to fewer works. At r^*, the ratio on the left hand side is one; the numerator and denominator both equal n^*, the number of works where profits cover creation costs. There are no created works where the profit-maximizing price is less than the maximum fair use reservation price. The $\overline{D}$ term in the numerator will be the average number of fair uses of all works. From equation (14), we would not want to make fair use any more generous than r^* if at r^*

$$\frac{r^* \overline{D}(r, n^*)}{[CS(0, n^*) - c]} \varepsilon_{USE} < \varepsilon_N, \tag{14}$$

If the elasticity of the number of works created sufficiently exceeds the elasticity of fair uses at r^*, a more generous fair use regime will reduce net economic welfare.

Aggregate consumer surplus

As before, the difference between net economic welfare *NEW* and aggregate consumer surplus *ACS* is that the latter does not include profits for works created, represented by Area 3 in Figures 2 and 3. As consumer surplus includes only Areas 1 and 2 in the cases portrayed by those figures, aggregate consumers surplus over all works supplied is

$$ACS(r) = \int_0^{N^*(r)} \left[CS(p^*(n), n) + CSF(r,n)\right] dn + \int_{N^*(r)}^{N(r)} \left[CS(r,n) + CSF(r,n)\right] dn$$

Because $CS_r(r, n) = -D(r, n)$, maximizing *ACS* with respect to *r* gives[32]

$$\frac{d(ACS)}{dr} = \int_0^{N(r)} -rD_r(r,n)dn + \int_{N^*(r)}^{N(r)} -D(r,n)dn + N'(r)[CS(r, N(r)) + CSF(r, N(r))].$$

At $N(r)$, the combined consumer surplus for customers with reservation prices above *r* who pay for the work and for those who with reservation prices below *r* who use the work for free is just the total available surplus $CS(0, N(r))$ less cost, as profits just cover cost at $N(r)$ by definition. The bracketed term in the above equation is $CS(0, N(r)) - c$, implying from equation (12) that

$$\frac{d(ACS)}{dr} = \frac{d(NEW)}{dr} + \int_{N^*(r)}^{N(r)} \left[-rD_r(r,n) - D(r,n)\right] dn\,. \tag{15}$$

The expression in the integral in equation (15) is the negative of the derivative of the profit function at *r* for works where the fair use reservation price exceeds the profit-maximizing price. For prices above the profit-maximizing price, that derivative is negative, i.e., $rD_r(r, n) + D(r, n) < 0$. This makes the integral in equation (15) positive. At r_{NEW}, increasing *r* further would increase *ACS*. The degree of fair use that maximizes aggregate consumer surplus, r_{ACS}, exceeds r_{NEW}. The result is qualitatively the same as in the "equal leakage" case, for similar reasons—profits lost when fair use is increased do

[32] Because $p^*(N^*(r)) = r$ by definition of N^*, $CS(p^*(N^*(r)), n) = CS(r, n)$. Thus, terms in this derivative with $N^{*\prime}$ cancel, as in the calculation of the derivative of *NEW*.

not count against aggregate surplus as they do against net economic welfare. The difference depends on the convexity of the profit function, which determines the degree to which the integral in equation (15) is positive. If $r_{NEW} = r^*$ because equation (14) holds, r_{ACS} may equal r^* as well. Changing the policy objective from economic welfare to consumer surplus, ignoring profits to creators, need not lead to a more generous fair use regime.

Gross benefit

As in the earlier case, we can define gross benefit *GB* as the gross consumer surplus associated with all uses of the work, neglecting costs. For works where the fair use reservation price is less than the profit-maximizing price, as portrayed in Figure 2, the gross benefit is represented by Areas 1, 2, 3, and 4. For works where the reservation price exceeds the profit-maximizing price, the gross benefit will be the consumer surplus obtained if uses were free to all. In both cases, gross benefit equals net economic welfare with creation costs of the works added back in. Accordingly, as with the "equal leakage" case, equation (9) holds, adapted for measuring fair use by the reservation price below which uses are free, i.e.,

$$\frac{d(GB)}{dr} = \frac{d(NEW)}{dr} + cN'(r). \tag{16}$$

At r_{NEW}, where the first term on the right hand side is zero, the derivative of gross benefit will be negative ($N' < 0$). The fair use regime that maximizes gross benefit, r_{GB}, will be less than r_{NEW}. If creation costs are disregarded, the social calculus will tilt toward increasing the number of works and away from uses per work, relative to where net economic welfare is maximized. The degree to which r_{GB} falls below r_{NEW} depends on how sensitive is the supply of works to the level of fair use. If N' is small, these will differ little. Moreover, as r_{NEW} may equal r^*, r_{GB} will be even more likely equal r^*, the value of fair use that maximizes the supply of works.

Number of uses

We turn last to finding the degree of fair use that maximizes access as measured by the number of uses of works. For works where the profit-maximizing price exceeds the fair use reservation price r, the number of uses will be those purchased at the profit maximizing price, $D(p^*(n), n)$, plus free uses under the fair uses regime, $D(0, n)$ –

$D(r, n)$.[33] For works where the fair use reservation price exceeds the profit-maximizing price, all $D(0, n)$ uses with a positive value will occur. The total number of uses, $USE(r)$, is

$$USE(r) = \int_0^{N^*(r)} [D(p^*(n), n) + D(0, n) - D(r, n)]dn + \int_{N^*(r)}^{N(r)} D(0, n)dn.$$

The number of uses will be maximized at r_{USE}, defined by the first-order condition

$$\frac{d(USE)}{dr} = \int_0^{N^*(r)} - D_r(r, n)dn + N'(r)[D(0, n)] = 0 \qquad (17)$$

The first term is the increase in uses from making more of them "fair;" the second is the lost uses from the reduced output when a more liberal fair use regime reduces the supply of works.

To see how r_{USE} compares to the other fair use standards, multiply the derivative in equation (17) through by r. Comparing the result with equation (12) gives

$$r\frac{d(USE)}{dr} = \frac{d(NEW)}{dr} + N'(r)[rD(0, n) - [CS(0, N(r)) - c]]. \qquad (18)$$

As $N' < 0$, this expression is positive at r_{NEW}, i.e., that $r_{USE} > r_{NEW}$, if and only if

$$rD(0, n) < CS(0, N(r)) - c \text{ at } r_{NEW}.$$

Dividing both sides by $D(0, n)$ implies that $r_{USE} > r_{NEW}$ if and only if r_{NEW} is greater than the average net surplus over all uses of the marginal work at r_{NEW}.

The ambiguity of this result indicates that even if $r_{USE} > r_{NEW}$, r_{USE} may be below r_{ACS}, the value of fair use that maximizes consumer surplus. This ambiguity is greater than that in the equal leakage case, where we have good reason to believe that fair use would be stronger under a consumer surplus standard than under a total use standard. The difference arises because the added uses in this case from increasing fair use are valued at r. In the "equal leakage" setting, case the added uses are valued at the average willingness to pay over all works, which is likely to be greater than the average surplus associated with foregone uses of the marginal work.

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[33] See Figure 2.

We can say a bit more about the comparison between r_{USE} and r_{GB}, the value of fair use the maximizes gross benefit. From equations (16) and (18),

$$r\frac{d(USE)}{dr} = \frac{d(GB)}{dr} + N'(r)[rD(0, n) - CS(0, N(r))].$$

This expression implies that $r_{USE} > r_{GB}$ if and only if $rD(0, n) < CS(0, N(r))$ at r_{GB}, i.e., that r is less than the average willingness to pay for the marginal work over all uses.

Summary

Recasting fair use closer to the transaction-cost theory of allowing uses below a target reservation price preserves many of the results of the first "equal leakage" case. As in that case, fair use is strongest if aggregate consumer surplus is the objective and weakest if numbers of works is the objective. In between those two, the level of fair use that maximizes net economic welfare exceeds the level that maximizes gross value of uses.

$$r_{ACS} \geq r_{NEW} \geq r_{GB} \geq r_N = r^*,$$

where r^* is the maximum reservation price for free uses that would not discourage creation of any works.

The analysis of how a gross benefit standard compares to the net economic welfare standard is largely the same in both cases. But explanations for these inequalities differ. Here, the degree to which r_{ACS} exceeds r_{NEW} depends on the extent to which increasing the level of fair use reduces profits for works for which the fair use price exceeds the price the copyright owner would prefer to charge. Those lost profits are the difference between what matters at the margin between aggregate consumer surplus and net economic welfare.

The difference between r_{NEW} and r_N depends here on the ratio of the supply elasticity of works compares to the elasticity of fair uses. It may well be that at $r_N = r^*$, this ratio is small enough so that $r_{NEW} = r_N = r^*$; deviations above the minimum reduce welfare. Under some conditions, it could be that we have strict equality among all the terms in the above expression. We would not want to increase fair use beyond the minimum regardless of the policy objective. Finally, the degree of fair use that maximize uses of copyrighted works in this setting may or may not exceed the level that maximizes net economic welfare or gross benefit. It depends on whether the average net surplus or gross surplus is less than the maximum value of a fair use.

Conclusion

The goal of the analysis here is to lend some insight into the optimal fair use standard, particularly how that standard might depend upon the criteria by which copyright policy should be judged. Tractability considerations led to focusing on one economic context, in which copyrighted works are created at constant cost and serve markets with independent demands. Fair use took two forms, one in which some fraction of uses were freely available ("equal leakage"), and a second in which uses below a maximum willingness to pay were available for free ("reservation price"). The standards were evaluate according to numbers of works supplied, net economics welfare, aggregate consumer surplus, gross benefit, and numbers of uses.

In these case, we found relationships that one would expect. Interest in numbers of works created would lead to weak fair use standards, interest in consumer surplus would lead to a more generous fair use regime, with net economic welfare in the middle. How fair use might be implemented under these various criteria, and whether those differences are significant, are influence by different factors in the two settings. Convexity of profit functions matters more under a reservation price criteria, for example, while price levels of the copyrighted works play a stronger role under the "equal leakage" setting. In either context, focusing on gross benefits would lead to less generous fair use, as that standard does not subtract out creation costs. Under the reservation price setting, under virtually any criterion, if the elasticity of supply of works with respect to the fair use standard is sufficiently large, the effect of the standard may not matter. The optimal fair use standard may be the maximum consistent with no reduction in the supply of works at all.

Focusing on uses regardless of surplus led to ambiguous and different answers in the two settings. Under equal leakage, focusing on uses would likely lead to a less generous fair use standard than that maximizing aggregate consumer surplus. Neglecting the value of uses would tend to rebalance the relevant tradeoffs more in favor of additional, less economically valuable works and away from giving users with high willingness to pay greater free access to works. Under the reservation price regime, the relative generosity standard promoting uses depends on how the maximum reservation price for fair use depends on the average net or gross surplus from marginal works.

In either case, a fair use standard based upon maximizing uses of copyrighted works could be less generous than one designed to maximize net economic welfare. The latter takes value to consumers into account and thus could tilt in favor of access to highly valued works over uses of less valued works. A corollary is that if the copyright policy balance is seen as one between numbers of works and numbers of uses, neglecting values based on willingness to pay (of wealthy rather than poor users, say) and profits, fair use may be less generous than if efficiency is the standard. The optimal level of fair use would be between that maximizing uses and that maximizing supply of works, and both standards may be less generous than that maximizing net economic welfare.

It may be worthwhile to investigate different settings to see whether these results are robust. One would be to view copyrighted works as being perfect substitutes from the consumers' perspective, also created at a common fixed cost and zero marginal cost, but where each copyright holder chooses simultaneously how much of the work to make available.[34] A second class of models to investigate would involve competition among suppliers of differentiated models. Even as these models become more complex and still arbitrary, we are very unlikely to get to a point where models can give precise estimates of how fair use should be designed. While these benefits may be small, we may lose the ability to inform what are inevitably only judgments we can make about the best ways to design copyright policy.

[34] In other words, one could treat a market for copyrighted works as a Cournot oligopoly, where players choose how many copies of a work to make available. For another analysis of copyrighted works markets using a Cournot model, in this case the strategic interaction between a copyright holder and a single producer of pirated copies, see R. Watt, *Copyright and Economic Theory* (Northampton: Edward Elgar, 2000): 37-54.